

December

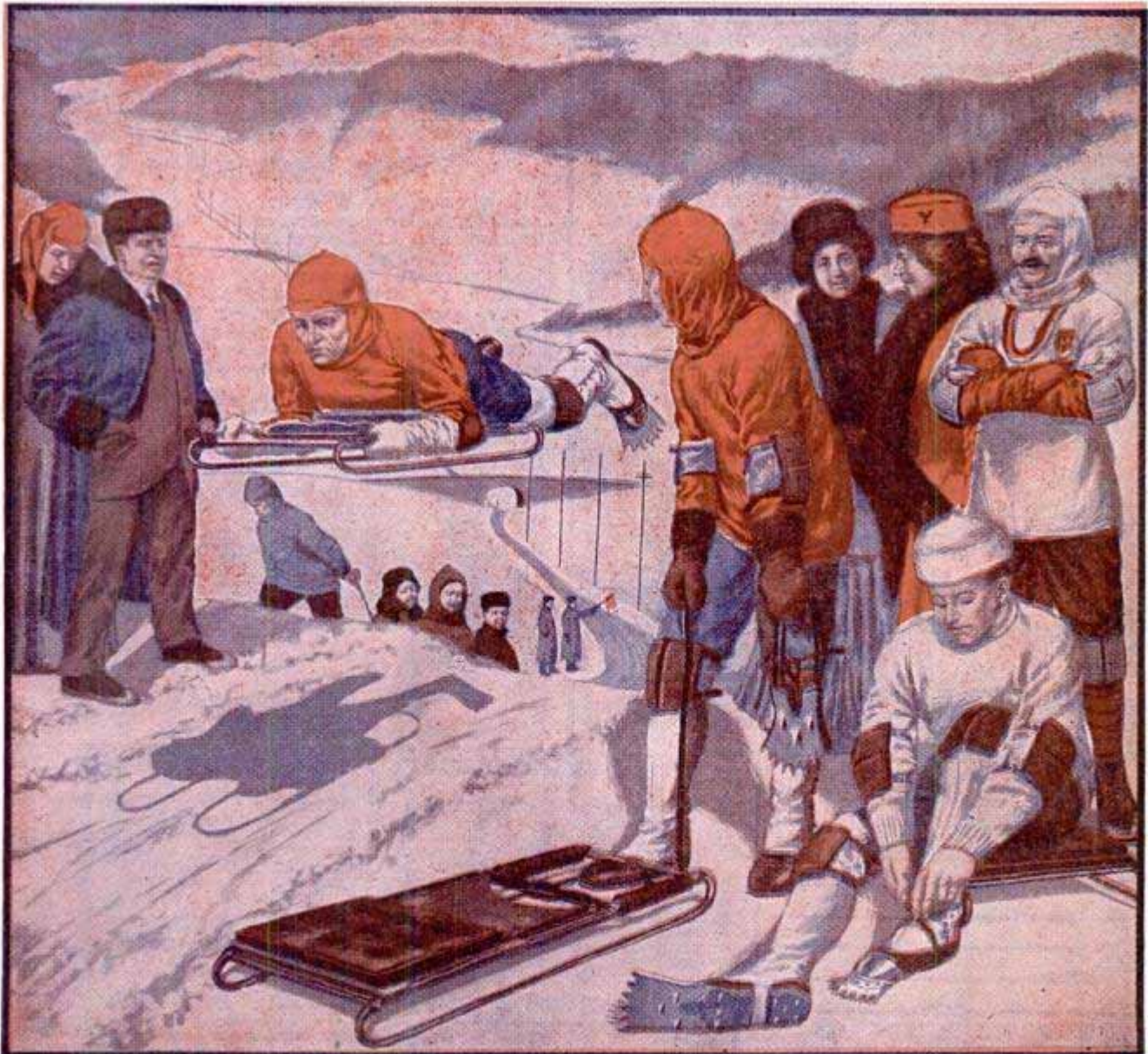
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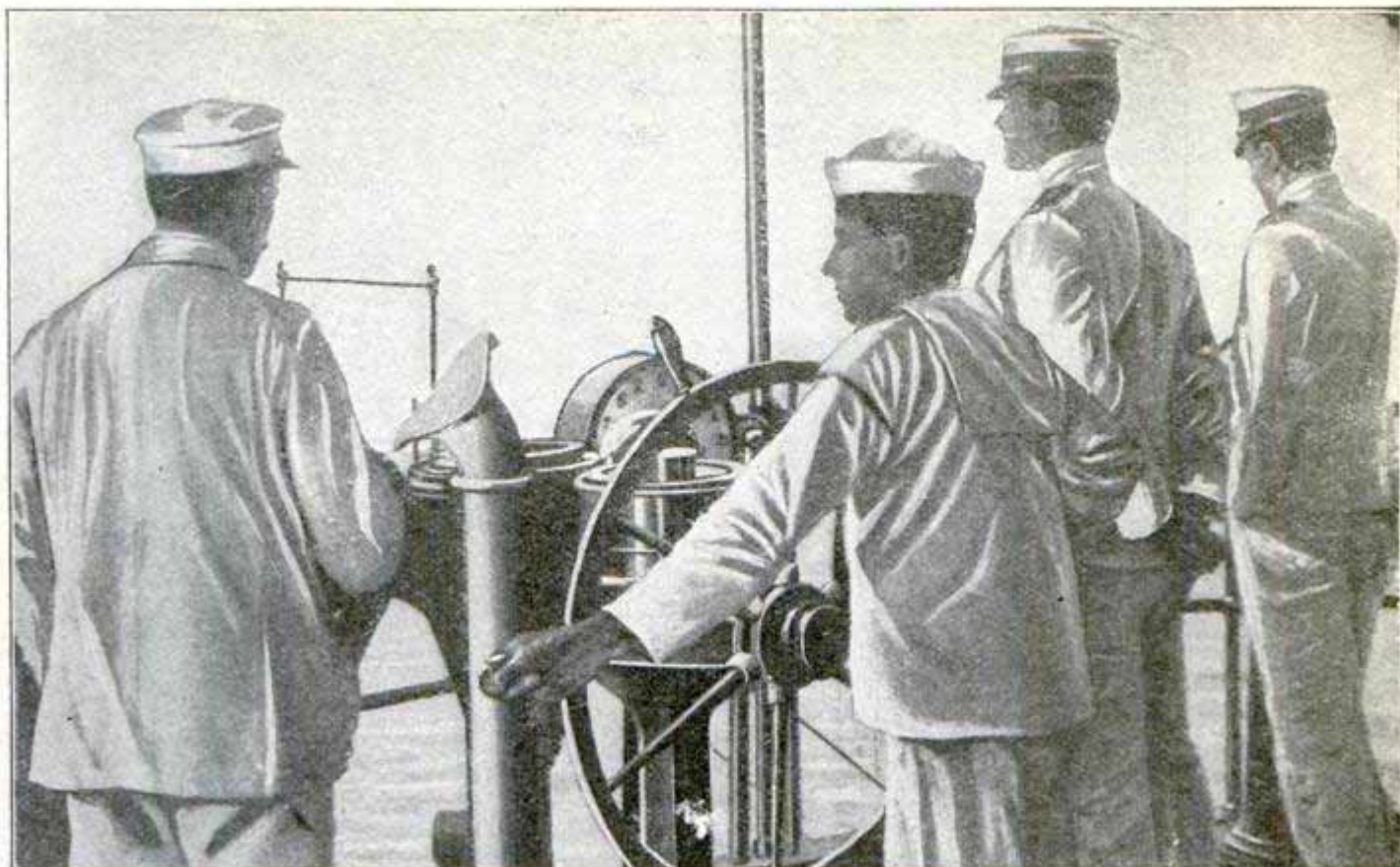
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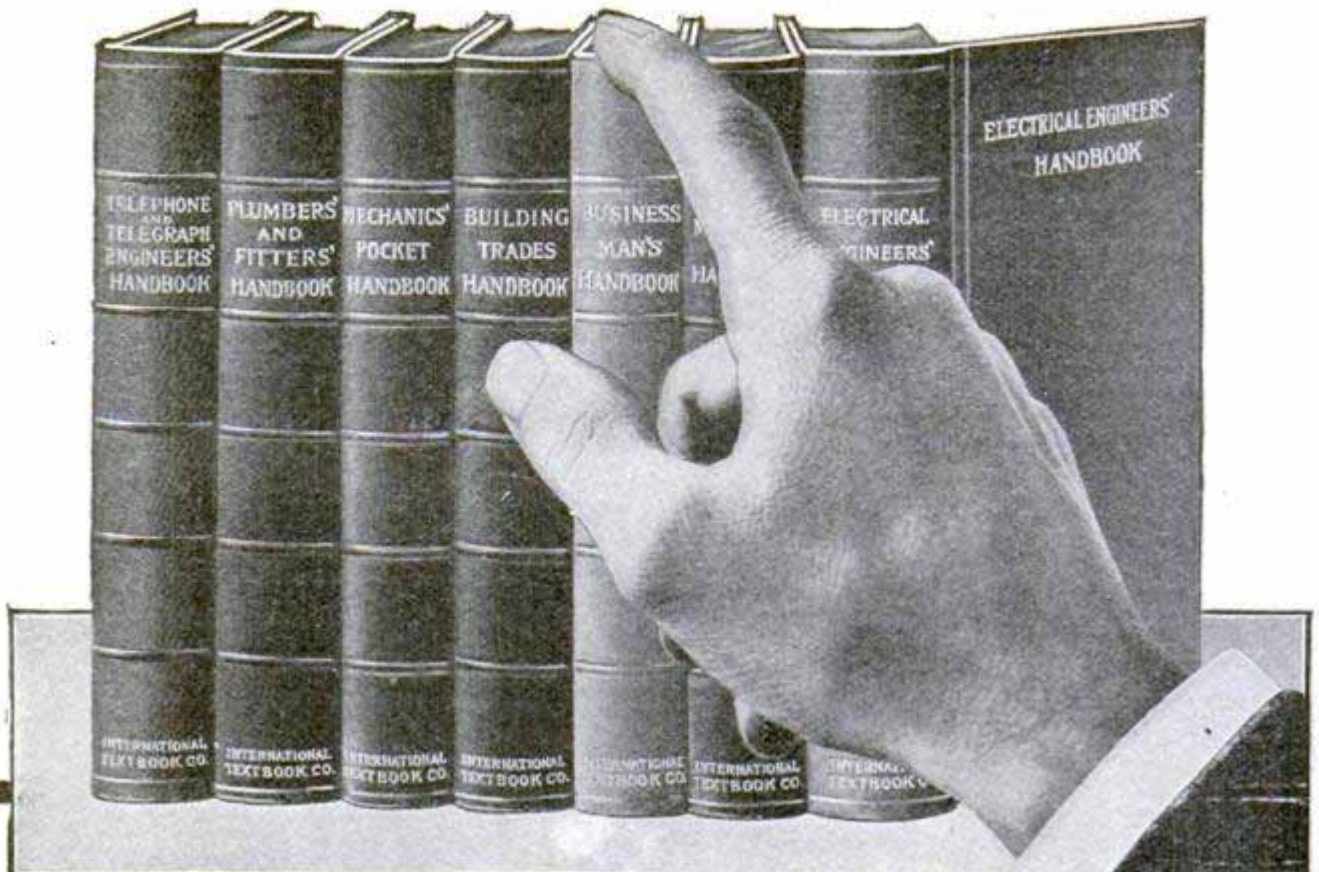
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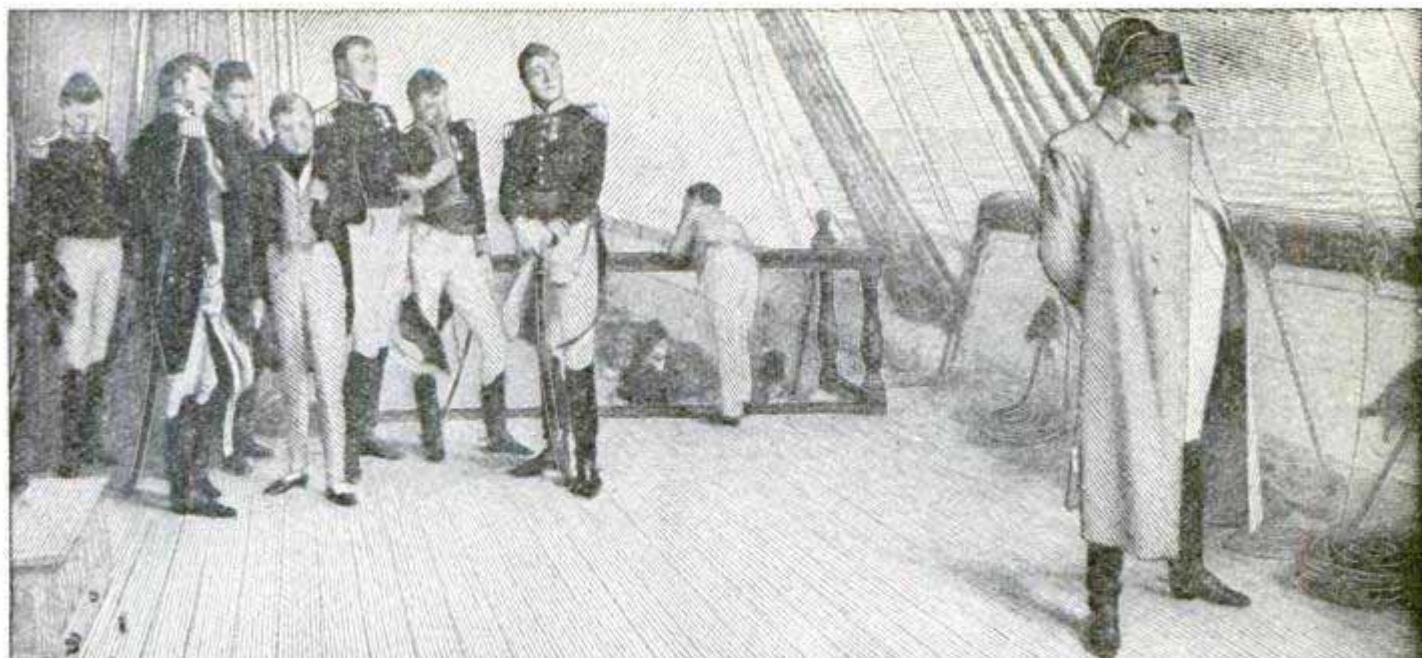
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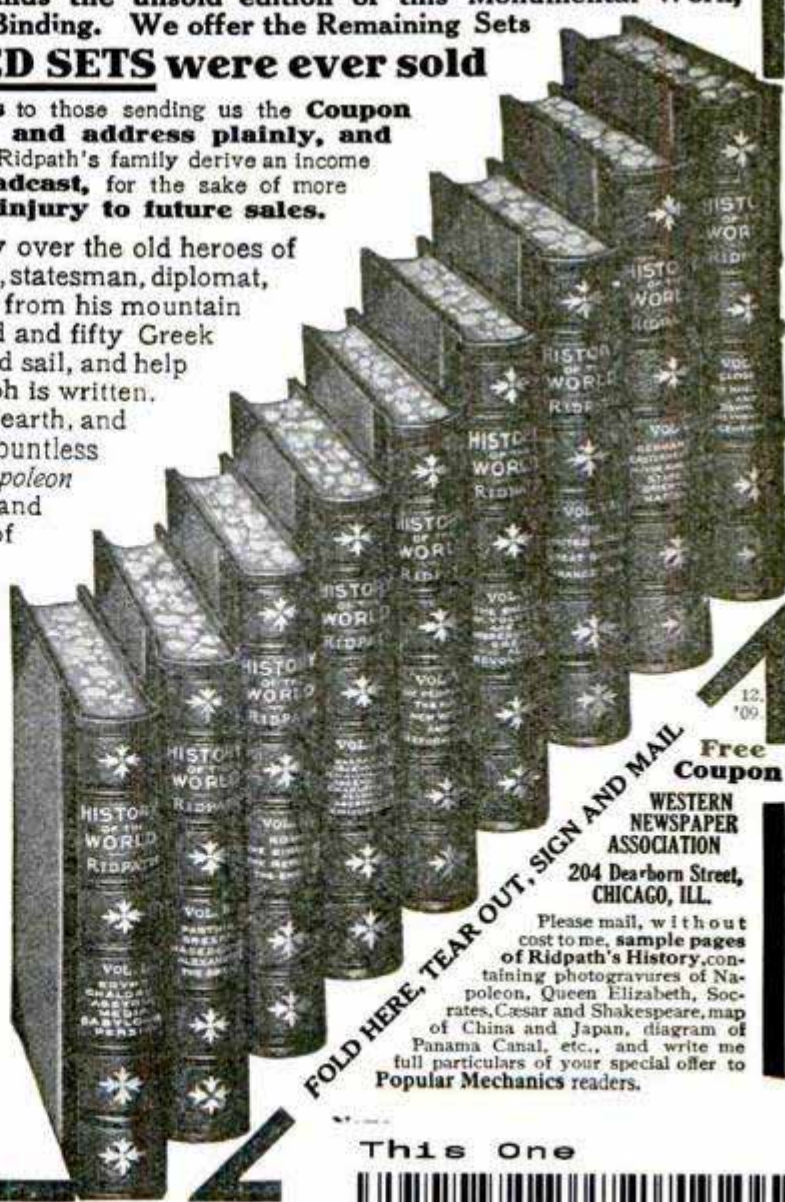
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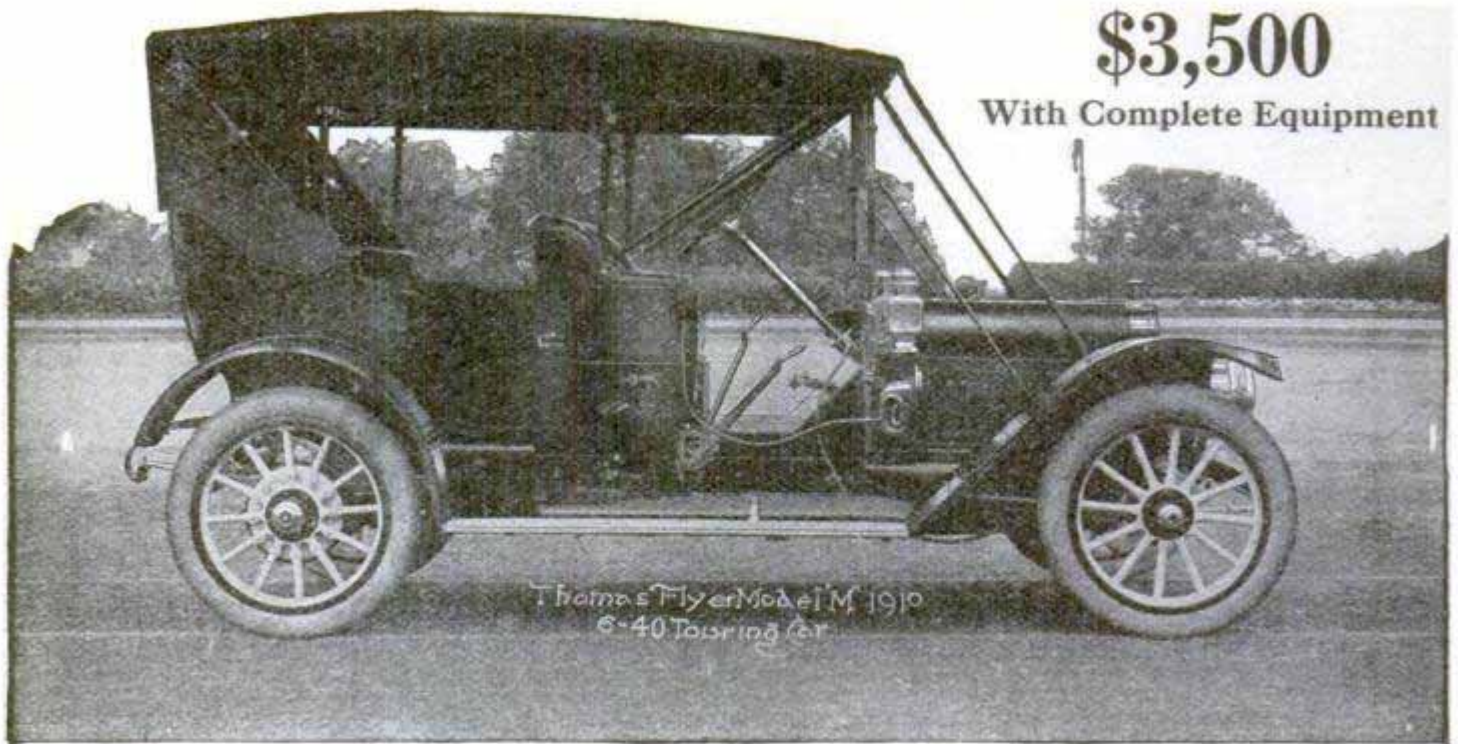


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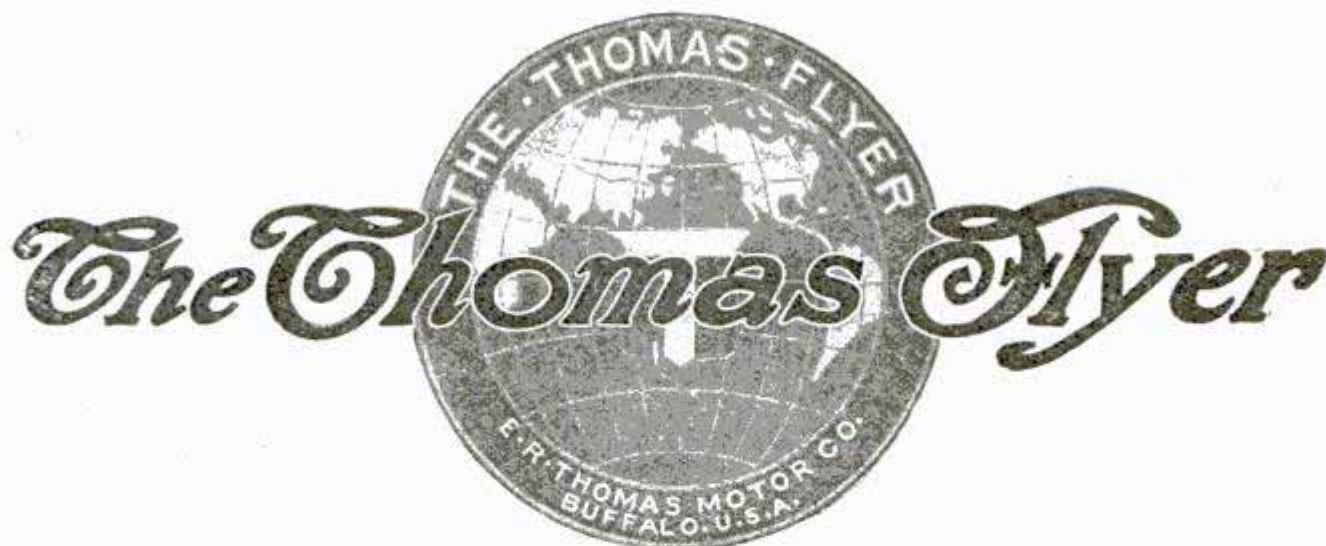
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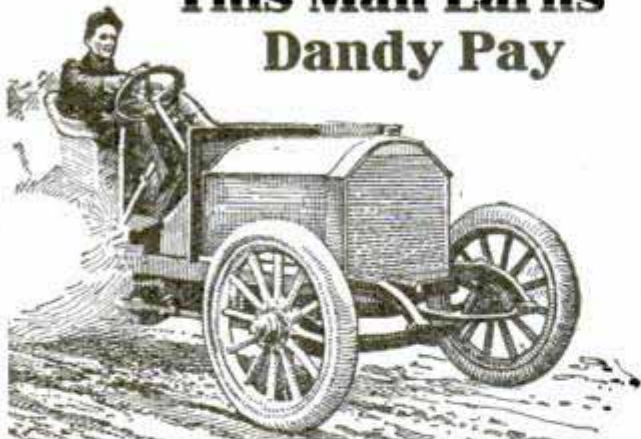
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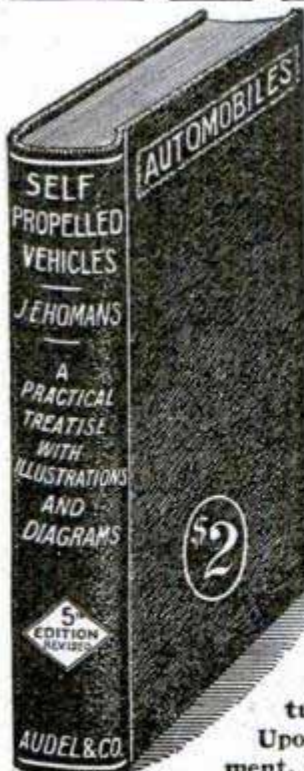
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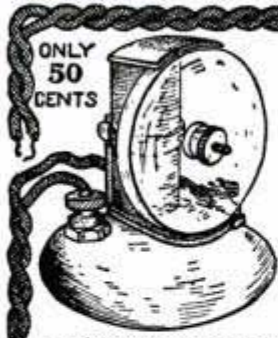


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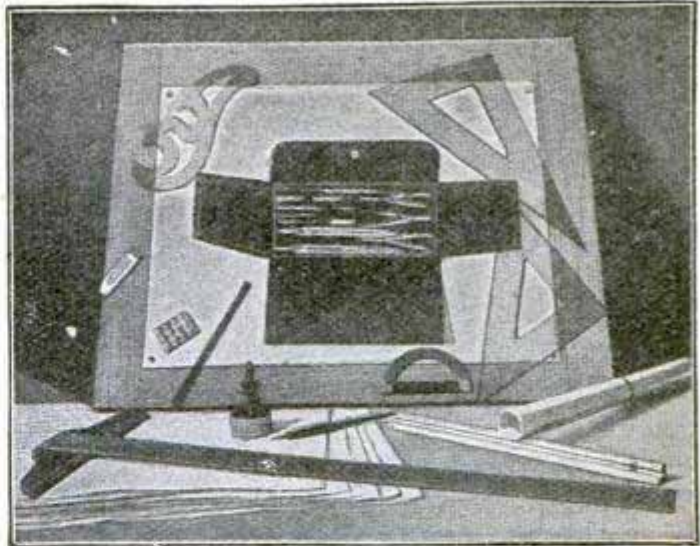




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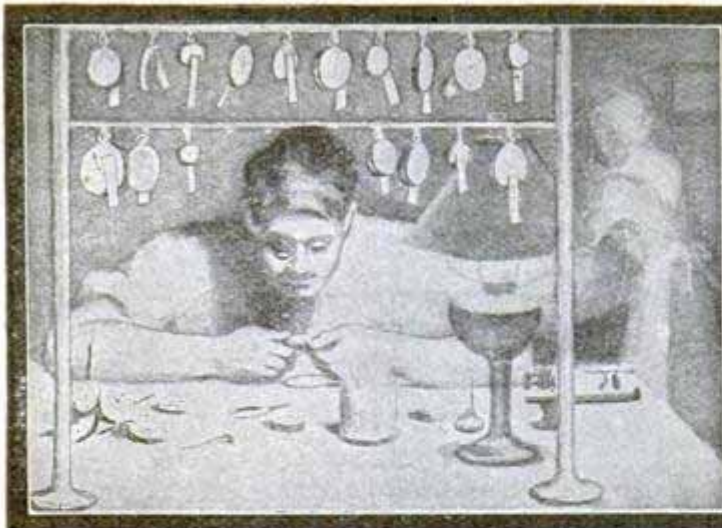
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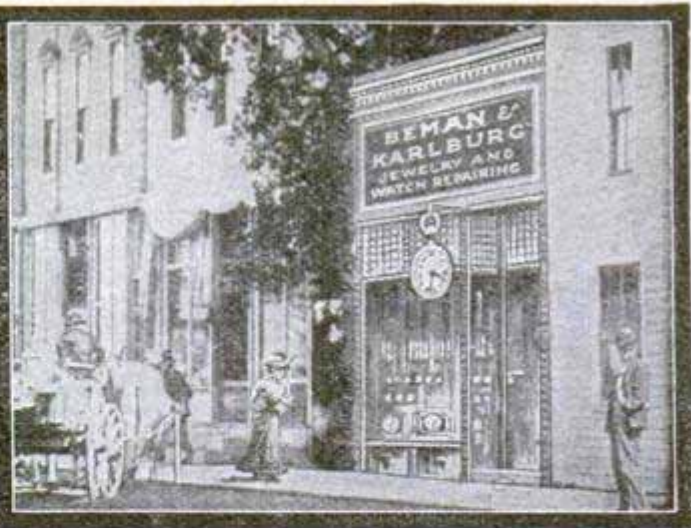
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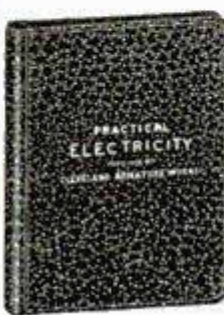


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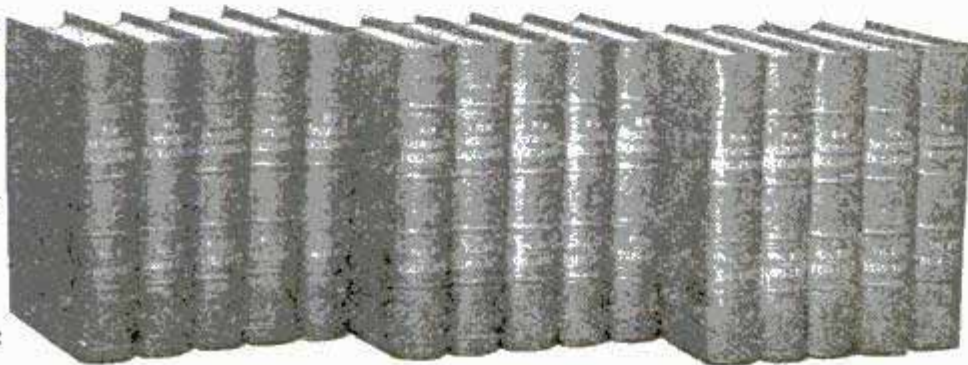
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**"EVERCLEAR" CLEANS EYE-GLASSES** and spectacles and prevents steaming. A specially treated cloth, soft as chamomile. Used like a handkerchief. Send 15c for regular size. Dept. B. Agents wanted everywhere. Everclear Co., Beloit, Wis.

**10c. COIN** brings the Modern Money-maker outfit, instructions, etc., together with other side line hints. Will produce upwards of \$1,000 a year in spare time on less than \$1 capital invested; money back if the Modern won't make good. A. W. Frey Supply Co., Lititz, Pa.

"PERPETUAL" WICK. For lamps and oil stoves; better light, less oil; no trimming, smell, smoke or broken chimneys. Fine chance for agents. 3 samples mailed 10c; assorted doz., 25c. Dept. A., Vitrum Works, Warren, R. I.

AGENTS—Novelty Photo. Easels are fast sellers, 100% profit. Three Sample Easels post-paid 10c. Geo. Woods, 2013 West Twenty-fifth St., Cleveland, Ohio.

AGENTS need not pay license for canvassing. Interstate commerce law prohibits it. Send 10c for Supreme Court decisions. Boulder Supply Co., Box 596, Boulder, Colorado.

AGENTS, \$5.00 daily selling goods; outfit 25c. Velvet Polish Co., Litchfield, Ill.

WANTED—MEN AND WOMEN EVERYWHERE to make our newest confection, MAPLE CREAM CRISP. Start a wholesale business at home. Can be made in any kitchen. Big money for the holidays. Single batch retails for \$3.00. Receipt and full instructions for only \$1.00. Address S. D. Russell, 42 School, Oshkosh, Wis.

AGENTS, if willing to make a good sum of money during winter months, working for yourself, write us with stamp for free particulars. Benz Co., Box 2, South Chicago, Ill.

COUNTY MANAGERS WANTED in Mass. to handle the best \$1 per yr. accident ins. issued. Regal Registry Co., Dept. M., Middleboro, Mass.

AGENTS Get something you can sell. Our household preparation sells. Big profits. Write for sample. N. E. Storms & Co., Minneapolis, Minn.

OH, YOU KID! A laughter and coin raising novelty, for men only. Quickest seller ever was, 200% profit. Sample and particulars 15c. Winslow Mfg. Co., Dept. M., Portland, Me.

MEN AND LADIES—Useful household specialties; sell in every home; big profits. Agents earning \$200.00 monthly. Best proposition on the market. Write for catalogue of over 300 fast sellers. Henry Martin & Co., 5323 Greenwood Ave., Chicago.

HANDCUFFS, legirons, twisters, etc., for policemen; repairs, etc. Handcuffs, \$3.50 pair up. F. Widmayer Co., 2312 Broadway, New York City.

MAKE MONEY: try our plan, see Business Opportunities. Glines Co.

WE ARE SELLING REST-MORE Kitchen Cabinets direct to the home from the factory at one small profit. Credit on customer's terms. Send for catalogue. Have opening for local representatives—exceptional contracts. Indiana Cabinet & Mfg. Co., Andrews, Ind. Dept. P1.

I WANT EXPERIENCED, competent salesmen who are able to earn from \$2,000 to \$5,000 a year selling an article more useful than sewing machines, more profitable than cash registers. J. J. Weyer, 8 E. Mich. St., Chicago.

AGENTS WANTED to sell our new Pocket Skate Sharpener, one that will absolutely do the work. Retail 15 cents, big profits, quick sales. White Vend. Co., 5 West Madison, Chicago.

2254 OF OUR MEN averaged \$7.42 profit per day selling "Wear-Ever" aluminum specialties during July and August, 1909. Few of these men had any previous selling experience. Work made pleasant by our 175 page Instruction Book. No door to door canvassing. Let us show you what others have done. Address Desk 52, Aluminum Cooking Utensil Co., Pittsburg, Pa.

MANY-TOOL—Greatest pocket tool ever invented. 10,000 sold in Chicago, 75c each. Agents reaping harvest. Contains marking point, compass, T-square, rule, file, dividers, knife. Sample, 25c. Rose Co., 4732 Park Ave., Chicago.

HOUSEHOLD INVENTION. Agents; Capital; Manufacturers write. Box 579, La Crosse, Wis.

MERRY WIDOW HANDKERCHIEFS, the joke of the season, 'nuf said. Agents price, 15c pp. Percy Ewing, Decatur, Ill.

TABLE CRUMB COLLECTOR. New patented article and the only one of its kind, one needed in every home; free particulars. A. W. Grover Co., 41M, Attleboro, Mass.

BIG MONEY FOR AGENTS, selling our card board signs and price card tickets to merchants. Show the goods, they sell themselves. Sample outfit and full instructions, 25c. Michigan Novelty Co., Detroit, Mich.

AGENTS WANTED for Sash Locks, Hog Holder, Burglar Alarm, Chest Protector, etc. Catalogue free. Ewings, 190 Thatcher Place, Decatur, Ill.

AGENTS—New Invention; never before sold in your territory; horse owners wild about them; automatic hame fastener sells at sight; coin money; a fortune in your territory; free sample to workers; write at once. Automatic Fastener Co., G 727, Cincinnati, Ohio.

AGENTS handle our household specialty. Our selling plan is a winner. Premiums and liberal commission. Samples and particulars free. The Edwards Co., 708 Quincy Ave., Pawtucket, R. I.

OUR live household specialties will make you \$6 a day or more; write for proposition. Enoch Hayes, Fredonia, N. Y.

WALKING MADE EASY, by the new Tread-Heel-Air-Cushions, hygienic, invisible and easily adjusted. Big money for agents, dealers, catalog free. 40c per pair. Badger Supply Co., Mukwonago, Wis.

AGENTS Make \$5 daily selling our 11-piece kitchen set and other fast sellers. Stamp for particulars. Brand Agency, Times Square Station, New York City.

AGENTS—The latest. Five tools in one; key-ring, screw-driver, letter opener, pipe cleaner and bottle cap opener. Nickel plated sample by mail 10 cents. R. K. Eldridge Co., Quincy, Mich.

SALES AGENT, every county or state for "Kilfyre" dry extinguisher; \$25.00 weekly salary guaranteed to start. Address, Hayward, 34 Murray St., New York City.

AGENTS—If I knew your name I would send you our \$2.19 sample outfit free this very minute. Let me start you in a profitable business. You do not need one cent of capital. Experience unnecessary. 50 per cent profit. Credit given. Premiums, freight paid. Chance to win \$500 in gold extra. Every man and woman should write me for free outfit. Jay Black, Pres., 54 Beverly Street, Boston, Mass.

AGENTS SEE our New Selling Plan Doubles your Sales and Profits. Easy to sell 43 articles with one sample. Write for particulars and \$2.00 free offer. Fair Mfg. Co., Box 154, Racine, Wis.

BIG MONEY easily made selling Grab's Keyless Basket Bank. Big demand, unlimited field, 44,000 sold in two towns in 60 days. Hurry. Sample FREE. Victor M. Grab & Co., 1183 Ashland Block, Chicago, Ill.

AGENTS, TEACHERS, STUDENTS—Here's your opportunity. Shoes for flatirons; new device to iron with; sells like hot cakes, \$5 daily easily made; spare time valuable; investigate; begin at once, you can not lose; it's a winner. Information free. Dexter Supply Co., 334 Dearborn St., Chicago.

POPULAR MECHANICS wishes to secure an agent in every town and city in this country to sell our 6 volume set of Shop Notes. These books sell readily among machinists, shopmen, farmers, carpenters, blacksmiths and all who use tools. The commission to agents is very liberal. If interested write Mgr. of Book Dept., Popular Mechanics Co., 225 Washington St., Chicago.

WE WANT LIVE ENERGETIC AGENTS to sell our pure food cooking vessels direct to the consumer. Write at once for our proposition. The Wabash Pottery Co., Roseville, Ohio.

IN SIX MONTHS a boy made \$1,000 with our great Soap and Toilet Combinations. Be a Davis agent—work six hours a day—make \$200 a month. Get our profit sharing plan. Davis Soap Co., 80 Union Park Ct., Chicago.

AGENTS: Please write. Ingless Co., 1327 Prospect Ave., New York.

START A MIRROR FACTORY IN YOUR HOME or travel and make from \$10 to \$25 daily; we teach and trust you; 10c brings booklet; Part.; (None Free) Enlarge portraits in one hour; many other good things for agents. Start now; there's money in it. Hullinger's Mirror School, Francesville, Ind.

ALADDIN KEROSENE MANTLE LAMPS sell as fast as you can demonstrate them. Needed in every home. Generate gas from kerosene (coal oil) and give light more brilliant than city gas, gasoline or electricity. Our Sunbeam Burners fit other lamps. You are losing dollars every minute you hesitate. Write nearest office. Mantle Lamp Co., Desk 175, Chicago, Portland, Ore., Waterbury, Conn., Winnipeg, Can.

AGENTS—Our Pocket Pencil Holder sells to everybody. 25c. Terms free. Smith Specialty Co., 5 Dayton Pl., Worcester, Mass.

FASCINATING ELECTRIC STORE WINDOW display. Magic Optical Illusion Box. Makes articles appear and disappear continuously. To Agent, \$6 net. Description, how made, 10 stamps. 146 Erie Co. Bank, Buffalo, N. Y.

PARAGON SHORTHAND—Learned in one week. Valuable invention by expert stenographer; not by mere theorist. Speed capacity beyond reach of the hand. Easiest to read. Ten cents stamps for lesson and full particulars. A. Liehtentag, 1432 Camp St., New Orleans, La.

WE MANUFACTURE GLASS PAPER. Plain glass windows made to look like real stained glass. Easily applied. Sells to merchants, homes, churches, halls and other places. Samples of the paper with catalogue in colors and discount sheet sent for 10c. S. B. Parrish & Co., Lakeside Bldg., Chicago, Ill.

AGENTS WANTED—Sip's Magnetic Button Razor Sharpener does the trick, slick and quick. Sample 10 cents. Sip Mfg. Co., 910 Bergen Ave., Jersey City, N. J.

AGENTS WANTED—Earn \$4 to \$6 a day; necessities needed in every household; easy sales; repeat orders. C. DeVinney & Son, West DePere, Wis.

MEN, DO YOU WEAR SOCKS? If you do, send 25c for the greatest hosiery supporter ever put on the market, agents wanted everywhere. Write for our line of lightning sellers. J. M. Luers Agents' Supply Co., P. O. Box 457, Cincinnati, Ohio.

WE CAN GIVE a limited number of energetic men who can furnish references an opportunity to sell our apparatus among farmers. The business is very profitable. Davis Acetylene Co., Elkhart, Ind.

START NOW and take orders among your neighbors for reliable jewelry, novelties and extensively advertised tableware. Our beautiful catalog illustrating 1,000 holiday articles and our valuable book of salesmanship are free. You need no experience—risk nothing. Goods sent by prepaid express—safe delivery and satisfaction guaranteed. We furnish samples and give you large commissions or premiums of watches, diamonds and jewelry, also extra presents. Write for catalog. A. W. Holmes & Co., Manufacturing Jewelers, 62 Broad St., Providence, R. I.

EXPERIENCED SALESMAN, permanent business to represent us selling new modern duplicators, good profit, 100 copies in 15 minutes. Address C-curity Selling Co., Box 556, San Mateo, Cal.

CHECK PROTECTOR, Vest pocket size, 50c. Every business man should have one. Agents always wanted. Wharton Novelty Co., Marysville, O.

STOP PEDDLING—Send for our free prospectus. Something unusually alive for you. Write Brenner Co., Twin Bridges, Mont.

WE WANT LIVE AGENTS selling our high grade line of specialties; can make enormous profits, write for catalogue and prices. Garrelta, Box 46; Quincy, Ill.

EXPERIENCED AGENTS to represent us selling ladies' folding hand bags, 4 styles, 100% profit. Address C-curity Selling Co., Box 556, San Mateo, Cal.

AGENTS—You can make 60c profit on every dollar order you receive. Write for sample. N. Storms & Co., Minneapolis, Minn.

UNEQUALLED OPPORTUNITIES for Agents in handling our 3 Best Selling Staple Articles ever produced. Send 10c for 1 sample or 25c for the 3 and be convinced. The Capital City Supply Co., Jefferson City, Mo.

AGENCY! WANTED. E. Brewer, Route 2, Box 80, Joplin, Mo.

BE a chewing gum manufacturer at your home; no machinery necessary; 500 per cent profit; big demand; particulars free. R. Jensen, 1000 Thirteenth St., Denver, Colo.

AGENTS—Key checks, name plates, watch fobs, hotel and baggage checks; steel dies for stamping; sample free. Hart Manufacturing Co., 80 Guernsey St., Brooklyn, N. Y.

AGENTS make \$4.00 to \$5.00 a day selling handy clothes dryer. Sample 25c. Address Tomlinson Mfg., 358 Dix Ave., Detroit, Mich.

**AGENTS**—Now is the time. Make money for the holidays. Lightning selling household specialties. Particulars free. Central Mfg. Co., Dept. 3, 2740 Germantown Ave., Philadelphia, Pa.

**UNUSUAL OPPORTUNITY** for agents on a 25c article, particulars and small sample free. Bayro Company, 447 Baggs St., Detroit, Mich.

**AGENTS and Mail-Order men** we are making pocket knives with non-rusting blades of hardened copper. New and a big chance to make money. Box 372, Greenville, Pa.

**SEE MY AD** under Business Opportunities. A. Benson.

**OWN A BUSINESS.** Samples and Complete working plan good for \$4.00 daily, 12c. Employ help and double profits. Popular Culture Society, 1948 Estes Ave., Chicago.

**WANTED ELECTRICIANS, PLUMBERS** and mechanics in every town, to act as agents for De Witt soldering iron heater, new thing, liberal commission. G. M. Hamilton, 25 Wall St., Auburn, N. Y.

**AGENTS**—Stop peddling. When tired of ringing doorbells, send for our free prospectus and start a business of your own. Publishers Exchange, 3135 N. Darien St., Philadelphia, Pa.

**LOOK HERE** 75c profit every hour, selling 10c combinations; 2c stamp brings particulars, sample. Websters Advertising Combinations, Bridgeport, Conn.

**AGENTS**—Men and women we manufacture hosiery, replaced free when hole appears, easy sales, large profits, whole or part time. First reply obtains agency your city. Triplewear Mills, Dept. D., 724 Girard Ave., Philadelphia, Pa.

**ALL KINDS** most useful combination kitchen utensils ever manufactured. Agents wanted, fast sellers. Catalogue free. Western Supply Co., Montezano, Wash.

**BE YOUR OWN BOSS:** Start Mail-Order Business at home; devote whole or spare time. We tell you how; very good profits. Everything furnished. No catalog outfit proposition. For "Starter" and free particulars address, P. M. Krueger Co., 155 Washington St., Chicago, Ill.

**AGENTS**—Here's a corker; only pancake griddle in world that bakes square cakes; turns them; bakes six each time; 100 per cent profit. Canton Griddle Co., Canton, Ohio.

**BURGLAR PROOF LOCK.** "The Cannon" locks windows with 1 to 6-inch opening, 25c each. Agents send for prices. Cannon Mfg. Co., 1318 Asbury Ave., Evanston, Ill.

**BIG PROFITS.** Reliable manufacturing jeweler wants agents to sell 1,000 extensively advertised and fully guaranteed articles. Experience unnecessary. All goods sent prepaid. Extra premiums of watches, diamonds and table-ware. Write for finest catalog ever printed, valuable book of salesmanship and booklet of offer—all free. A. W. Holmes & Co., 62 Broad St., Providence, R. I.

**BE INDEPENDENT!** Start a mail order business in your own home. We tell you how, and furnish everything needed wholesale. An honorable and profitable business for man or woman. Particulars free. Many make \$3,000 a year. Murphy Mfg. Co., South Norwalk, Conn.

**SELL "DEN" PICTURES.** Immense profits; catchy; sell on sight. My plan ensures success. \$2 started me four years ago. Third year spent \$15,000.00 in advertising alone. Will show you how free. Address F. E. Armstrong, President Gordon Art Co., Dept. P., New York City.

**AGENTS** make big money selling our new sign letters for office windows, store fronts, and glass signs. Any one can put them on. Write today for free sample and full particulars. Metallic Sign Letter Co., 406 N. Clark St., Chicago.

**AGENTS WANTED**—A rare opportunity presents itself for a high class salesman to handle an article of utility needed on every street, in every home and store as well as halls and churches. Substantial commissions or straight purchase plan. Standard, 13 W. Michigan St., Chicago.

**AUTOMATIC POTATO PEELER.** Peels 12 potatoes perfectly in a minute. 250 other new patents. Big profits. Exclusive territory. Frank Edgren Company, Milwaukee, Wis.

**GET A LIVE ONE**—Agents making twenty dollars per day selling "Climax" Note Book Holders to stenographers and business houses. Sell at sight. Good territory open. American Specialty Co., Bridgeport, Conn.

**MEDALLIONS SELL AT SIGHT.** 300 per cent to 500 per cent profit. Make up your own goods and be independent. "It's easy." Catalog free. Fred Resag Co., 1205 W. Randolph St., Chicago.

**MEN WANTED** to sell the widely advertised Little Giant Household Pump. Saves Plumbers bills. Removes all stoppages in waste pipes, every one can afford it. Big commission. Write to J. E. Kennedy, Dept. P., 41 Park Row, New York.

**AGENTS WANTED**—Big Money! No experience required. Portraits, Bromides, Photo Pillow Tops, 30c. Frames at our factory prices; credit given. Catalogue and samples FREE. Dept. 8R. Ritter Art Studio, Van Buren St., Chicago, Ill.

**WANTED AGENTS**—MACHINISTS ATTENTION! Do you want to increase your salary? New, revised edition Saunders' "Hand Book of Practical Mechanics," fills the bill for every day shop reference. Machinists say: "Can't get along without it." Shop Kinks, secrets from note books. Tough problems figured by simple arithmetic. Pocket size price postpaid, \$1.00 cloth; \$1.25 imitation leather; \$1.50 real leather flap. Big profits, sells itself. Send for list of books. E. H. Saunders, 216 Purchase St., Boston, Mass.

**WANTED**—Buyers and agents to sell our cement block and fence post machinery. Send for circulars and prices. Address, W. L. Keller Cement Block Machine Co., Kearney, Neb.

**AGENTS**—Portraits, 35 cents; frames, 15 cents; sheet pictures, 1 cent; stereoscopes, 25 cents; views, 1 cent. 30 days' credit. Samples and catalog free. Consolidated Portrait Co., 1198 W. Adams St., Chicago.

**AGENTS WANTED**—Something new, sells on sight, \$3 to \$7 a day guaranteed our book "Piling Dollars" sent FREE. Address, Darling Bros., Derry, N. H.

\$150.00 worth goods free; free advertising to sell them, and \$60 expense allowance first month, to start you as Manager for big Chicago mail order house. Address President, 1274 State Street, Chicago.

**AGENTS** make 500 Per Cent Profit selling Our Novelty Signs. Any one can put up our New Gold and Silver Sign Letters, and make \$5.00 per day. Enormous demand. Catalogue and particulars free. M. O. Sign Co., 4741 State St., Chicago.

**AGENTS**—\$5 daily selling our Handy Tool, 12 articles in one. Lightning seller. Sample free. Thomas Mfg. Company, 462 Third St., Dayton, Ohio.

**AGENTS** are coining money selling our great combination tool, the Washington Hatchet. Ten tools in one. Sells at sight to farmers, housekeepers, storekeepers, etc. We can show you how to make from \$3 to \$10 a day; experience unnecessary. Write today for our agents' offer. H. Thomas Mfg. Co., 562 Third St., Dayton, O.

**WANTED**—Capable agents to handle new, high grade, up-to-date articles; lightning sellers in all homes, offices, stores, shops, \$3 to \$10 daily. Thomas Mfg. Co., 662 Third St., Dayton, Ohio.

**ONLY THINK!** \$30 a Week Easy with our NoSew Hooks and Eyes, and 70 other Big Money Makers; 6 brand new sellers; everybody buys. Anybody can sell. Biggest profits. Outfit free. P. M. Miller & Co., Box 155, Muskegon, Mich.

**AGENTS**—Sell Patented Radiumite Self-Honing Strop. Just being put out as an agency proposition. Strop covered by 16 patents. A \$2.00 razor given free with every strop sold. Strop retails for \$1.50. Millions being sold and agents coining money. Throw away old, worn-out propositions for something new and salable. F. J. King made 33 sales one Saturday afternoon in two hours. Outfit free. Thomas Mfg. Co., 762 Third St., Dayton, Ohio.

**DASHBOARD LINE HOLDER,** beautifully enameled, best snap for agents on the market; easily attached to any dashboard; holds lines securely while horse and buggy are standing. 24c. Illustrated catalogue free. Eureka Company, Wheaton, Ill.

**AGENTS**—\$75 monthly. Combination Rolling Pin. Nine articles combined. Lightning seller. Sample free. Forshee Mfg. Co., Box 248, Dayton, O.

**IF THERE WERE NO TELEPHONES** in your territory now, and you had the exclusive right of selling them there, your proposition would not be as good as one I have to offer you now, if you are the man or men. References First National Bank, Chicago. M. L. Pitner, 183-189 Lake St., Chicago.

**EXCEPTIONAL OPPORTUNITY** for energetic solicitors with grit and selling power. Article absolutely new and guaranteed. Tremendous seller. Everybody buys if shown. 60c to \$2 profit each sale. Virgin field awaits hustlers everywhere. Write today. Sanitax Co., 2309 Wabash Ave., Chicago.

**AGENTS**—Why can't you who sell so many inventions of others invent something yourself and get "royalties" instead of "commissions"? Read our free books—"Inventions Wanted" and "Inventor's Guide"—and think it over. There's big money in inventions. Write H. C. Evert & Co., 121 Smithfield St., Pittsburgh, Pa.

#### MALE HELP WANTED

**AN ENGINEER** in each town to sell the best rocking grate for steam boilers. Write Martin Grate Co., 277 Dearborn St., Chicago.

**WANTED**—RAILWAY MAIL CLERKS—CUSTOM HOUSE EMPLOYEES. Many examinations everywhere soon. Salary \$800 to \$1,600 yearly. No "lay-offs," short hours. Annual vacation. Salary twice monthly. Thousands to be appointed during 1910. Country and city residents equally eligible. Common education sufficient. Political influence unnecessary. To advertise our schools we are preparing candidates free. Write immediately for Schedule. Franklin Institute, Dept. M. 21, Rochester, N. Y.

**WANTED**—Automatic Screw Machine Operators for Brown & Sharpe Automatic machines. 36 cents per hour. Address Department 1056, Western Electric Company, Chicago, Ill.

**WANTED**—RAILWAY MAIL CLERKS—CUSTOM HOUSE EMPLOYEES. Many examinations soon. Salary \$600 to \$1,600. Rapid advancement. Steady work. Short hours, and annual vacation with full salary. Salary paid twice monthly. Thousands of appointments during 1910. City and country residents stand equal chances. Common education sufficient. Political influence unnecessary. To advertise our schools we are preparing candidates free. Write immediately for schedule giving examination dates and places. Franklin Institute, Dept. M., 21, Rochester, N. Y.

**WANTED**—Telephone Switchboard men; must thoroughly understand telephone switchboard circuits. Address Department 1056, Western Electric Company, Chicago, Ill.

**SPECIALTY SALESMEN**—Our Premiums for general country stores. References. Big Commissions. One Grip. Bunch Co., 1245-49 State St., Chicago, Ill.

**WANTED**—Die Makers, high grade men accustomed to small accurate work on compound dies. Address Department 1056, Western Electric Company, Chicago, Ill.

**WANTED** immediately Lumber salesman, also Shipper and Lumber superintendent in Lumber concern, who can take financial interest in same. Address P. O. Box 659, Vancouver, British Columbia.

**WANTED RAILWAY MAIL CLERKS**—CUSTOM HOUSE EMPLOYEES. Many examinations everywhere soon. Thousands of appointments during 1910. Salary \$600 to \$1,600. Rapid advancement. Annual vacation with full pay. Steady work. Common education sufficient. Country and City residents equally eligible. Candidates coached free. Write for Schedule, Franklin Institute, Dept. M. 21, Rochester, N. Y.

**MEN WANTED**—Young, strong, account increasing business on all railroads, for firemen or brakemen; \$75 to \$100 monthly; rapid promotion. State age, weight, height. Railway Association, Room 89, 227 Monroe Street, Brooklyn, New York. Distance no bar. Positions guaranteed competent men. Experience unnecessary.

**RAILWAY MAIL CLERKS—WANTED**—Commencement salary \$800. Rapid advancement to \$1200 or \$1400. Examinations everywhere soon. Common education sufficient. Preparation free. Write immediately for Schedule. Franklin Institute, Dept. M, 21, Rochester, N. Y.

**GOOD PAYING SITUATIONS OPEN**—Cash weekly made checking, attention advertising material for your locality. Enclose stamp for reply. Dept. A, Pandora Mfg. Co., London, Ont.

**RAILWAY MAIL CLERKS.** Commencement salary \$800. Many examinations everywhere soon. Preparation free. Franklin Institute, Dept. M, 21, Rochester, N. Y.

**WANTED: EVERY BOOKKEEPER TO READ** "How to Become a Head-Bookkeeper, Auditor or Public Accountant." Worth Reading. Will send it Free. Chas. A. Sweetland, 8 Boyleston Bldg., Chicago.

**WANTED—RAILWAY MAIL CLERKS—CUSTOM HOUSE EMPLOYEES.** Many examinations everywhere soon. Salary \$600 to \$1600. Rapid advancement to higher Government positions. No "Layoffs" because of hard times. Short hours and annual vacation with full salary absolutely certain. Salary paid twice each month. Thousands of appointments will be made during 1910. City and Country residents stand the same chance for immediate appointment. Common School education sufficient. Political influence not needed. To advertise our schools we are preparing candidates free. Write immediately for Schedule giving dates and places of the Examinations. Immediate attention is necessary. Franklin Institute, Dept. M, 21, Rochester, N. Y.

**WANTED—First class specialty salesman, one acquainted with saloon, drug and grocery trade. References required. Western Specialty Co., 309-310 Globe Building, Seattle, Wash.**

**RAILWAY MAIL CLERKS.** Commencement salary \$800. Many examinations everywhere soon. Common education sufficient. Preparation free. Franklin Institute, Dept. M, 21, Rochester, N. Y.

**WANTED BOYS**—Moving Picture machine with complete outfit and films. Free for a few hours work. Send for catalogue. Howard Mfg. Co., 158 Jay St., Schenectady, N. Y.

**RAILWAY MAIL CLERKS—Wanted.** Commencement salary \$800. Rapid advancement to \$1200 or \$1400. Short hours. Steady work. Annual vacation with full salary. Examinations everywhere soon. Common education sufficient. Preparation free. Write immediately for Schedule. Franklin Institute, Dept. M, 21, Rochester, N. Y.

**RAILWAY MAIL CLERKS.** Commencement salary \$800. Rapid advancement to \$1400. Examinations everywhere soon. Preparation free. Write for Schedule. Franklin Institute, Dept. M, 21, Rochester, N. Y.

**RAILWAY MAIL CLERKS.** Salary \$1000. Examinations everywhere soon. Preparation free. Franklin Institute, Dept. M, 21, Rochester, N. Y.

**FIVE HUNDRED STRONG YOUNG MEN WANTED** Immediately for firemen or brakemen on all railroads. Good vision. Account increasing business. 800 men sent to positions last two months. \$75-\$100 monthly. Promotion. State age, height, weight. Send stamp. Railway Association, Room 89, 227 Monroe St., Brooklyn, New York.

**WANTED**—High class salesman to sell greatest advertising novelty of the day. All classes of trade buy, and 50% reorder. Salesman's profit \$6.25 upward on each order. Exceptional money making opportunity. For attention give full details first letter. Novelty Dept., 160 Adams St., Chicago.

**BE A DRAUGHTSMAN**—Make \$125-\$150 monthly, we guarantee you actual draughting room experience in Architectural, Electrical, Mechanical, Structural, Gas Engine Drawing, etc., books and tools furnished. Write catalogue. Columbia Correspondence School, Dept. J., Drexel Bldg., Philadelphia, Pa.

**TRAVELING SALESMAN EARN \$1,000 to \$3,000 yearly.** Write for free book "How Salesmen Succeed." Graduates assisted to positions with reliable firms. Bradstreet System, Dept. 363, Rochester, N. Y.

**I WANT TO START YOU** in business: work in spare time, will pay you from \$100 to \$500 per month. \$10 capital. No canvassing. Increase from profits. A new idea, never fails. Free particulars. F. E. Abbott, Desk BL, Omaha, Neb.

**WE EXPECT** to have positions for a number of men as automobile car drivers, also interurban railroads; promotions guaranteed; only sober reliable men of age, who care to invest, need apply; experience unnecessary. Send four stamps for applications. Western Transportation Co., American Nat'l Bank Bldg., St. Paul, Minn.

**CHAUFFEURS**—\$5 per day paid to competent automobile drivers; a complete instruction book that will qualify you for these positions will be sent postpaid for 25c. This valuable book tells all about driving and adjusting automobiles; explains all gasoline engine troubles; satisfaction guaranteed or money refunded. George N. Pearson, Bala, Pa.

**AGENTS WANTED** for our new 25c Darning Machine; just out. Weaves new heel or toe in sock in a few minutes. One agent sold 288 in one day. Send 15c for sample or \$1.25 for doz. Hutton Co., Walnut St., Desk 2, Philadelphia, Pa.

**MANUFACTURERS WANT INVENTIONS.** We have hundreds of letters telling us what they want. Can't you invent something? Little ideas bring big fortunes often. Our free books—"Inventions Wanted" and "The Inventor's Guide" will start your brain working on practical much-needed inventions. Write for these books. Make your brain work for you. Advice and consultation about patents free. H. C. Evert & Co., 121 Smithfield St., Pittsburg, Pa.

**WANTED**

**WANTED**—I. C. S. Complete Steam Electrical Course and A. S. of C. Cyclopedia of Engineering. Latest editions only. John Bendel, Copper Hill, Arizona.

**WANTED**—Columbia Chainless Bicycle, Coaster Brake and Clincher Tires, good condition, cheap for cash. Lock Box 262, Cottonwood Falls, Kan.

**WANTED**—Second hand Motor Cycle for cash, give description. Clarence E. Cole, Box 223, Edinburg, Ind.

**PUBLIC DRAUGHTSMAN,** 3411 Abner Pl., St. Louis, Mo.

**WANTED**—An Engine (must be cheap). A. Wolke, Louisville, Ky.

**WANTED**—A cheap motorcycle (not particular about condition). A. Wolke, Louisville, Ky.

**WANTED**—To manufacture and put on the market New Novelties and Hardware Specialties. Address White Vending Co., 5 W. Madison St., Chicago, Ill.

**MOTORCYCLE, AUTOMOBILE.** Must be cheap. Will pay cash or exchange for same. T. F. Crawley, Bainbridge, Ga.

**WANTED**—AGENCY for small gasoline engine for farm use. Beaumier Iron Works, Brenham, Tex.

**WANTED**—Copies of Scientific American previous to 1899. Joseph Parker, Bedford, Va.

**WANTED**—Brazing and light machine work. Becker & Shoemaker, Exchange Pl., Elmira, N. Y.

**WANTED**—Gasoline Runabout in good condition, will pay cash. P. G. Hodge, R. F. D. No. 1, Fitzwilliam Depot, N. H.

**WANTED**—Aeroplane Engine fifteen to forty horsepower. Address "Engine," Palouse, Wash.

**WANTED**—Small Dynamo, Volt Meter, Small Gas Engine and Bike attachment. A. Warfel, Cadiz, Ohio.

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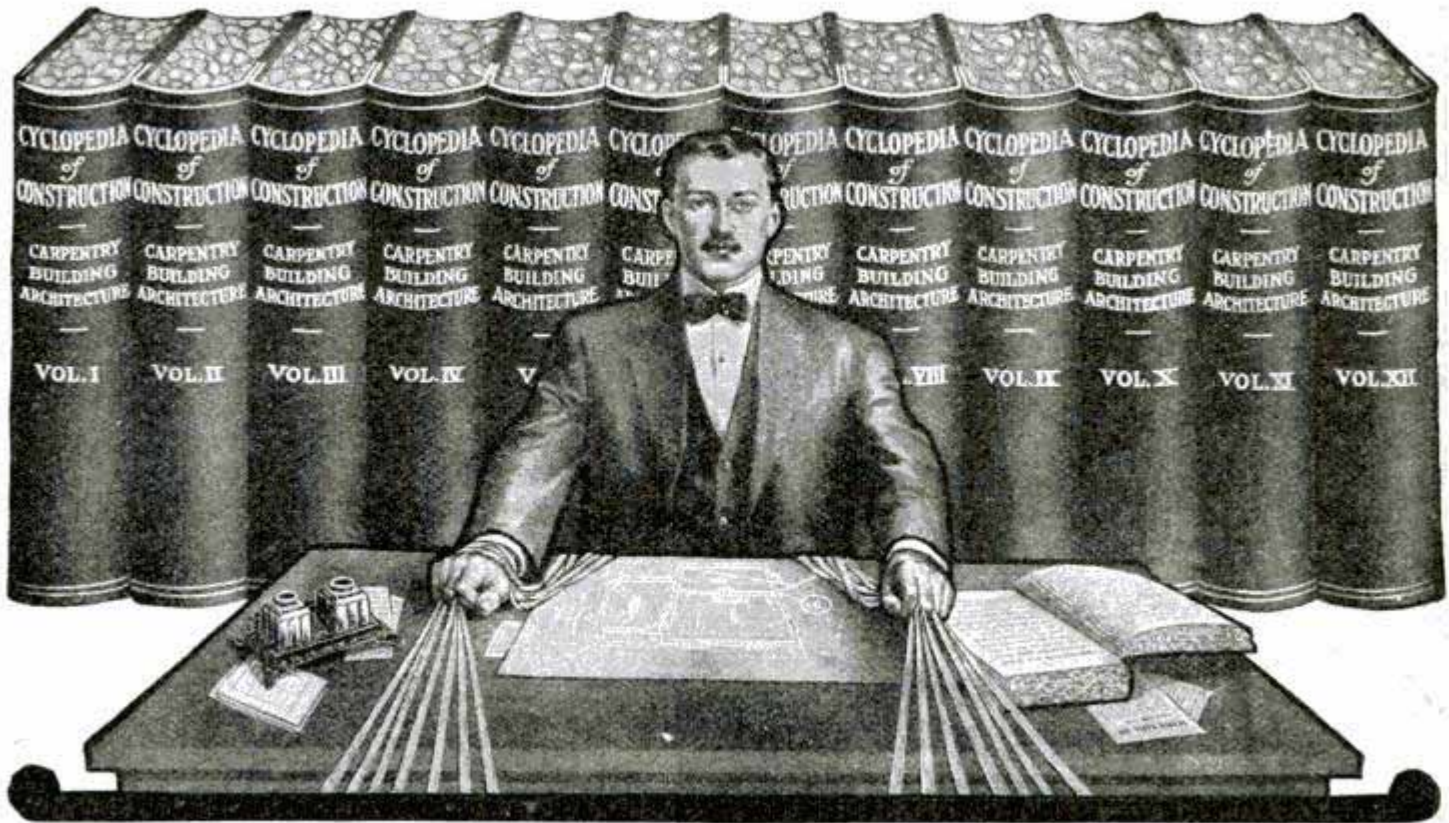
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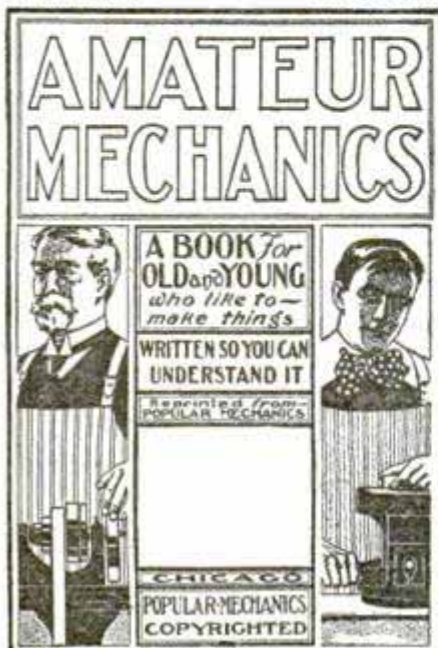
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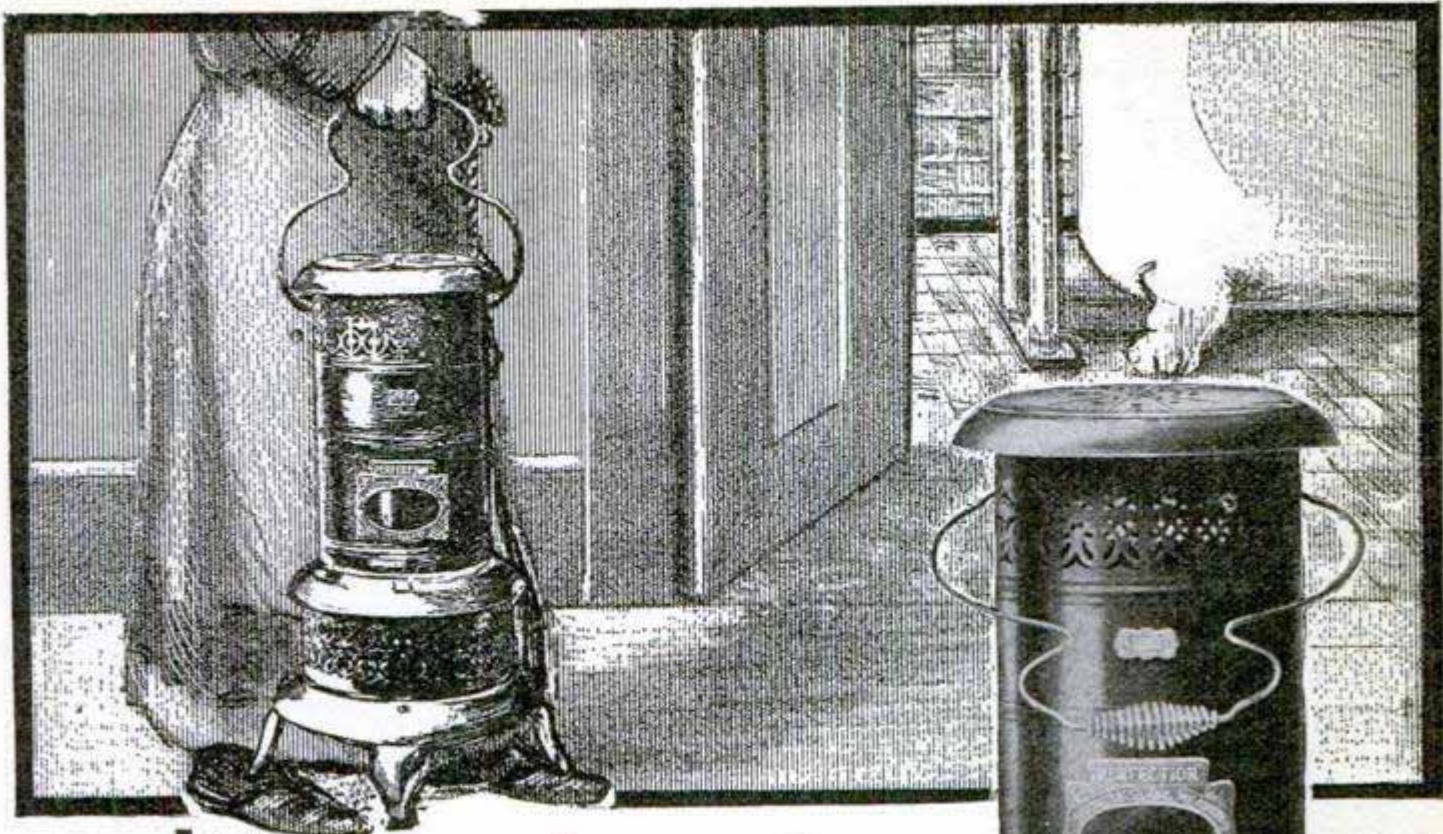
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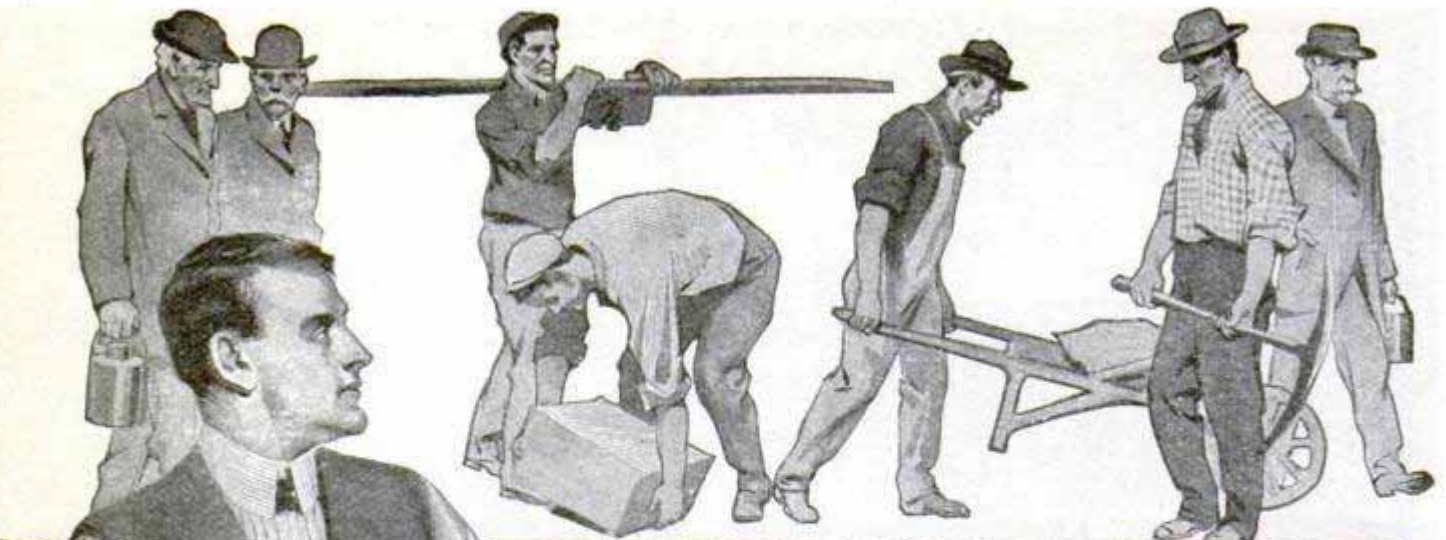
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(Popular Mechanics 12-09.)

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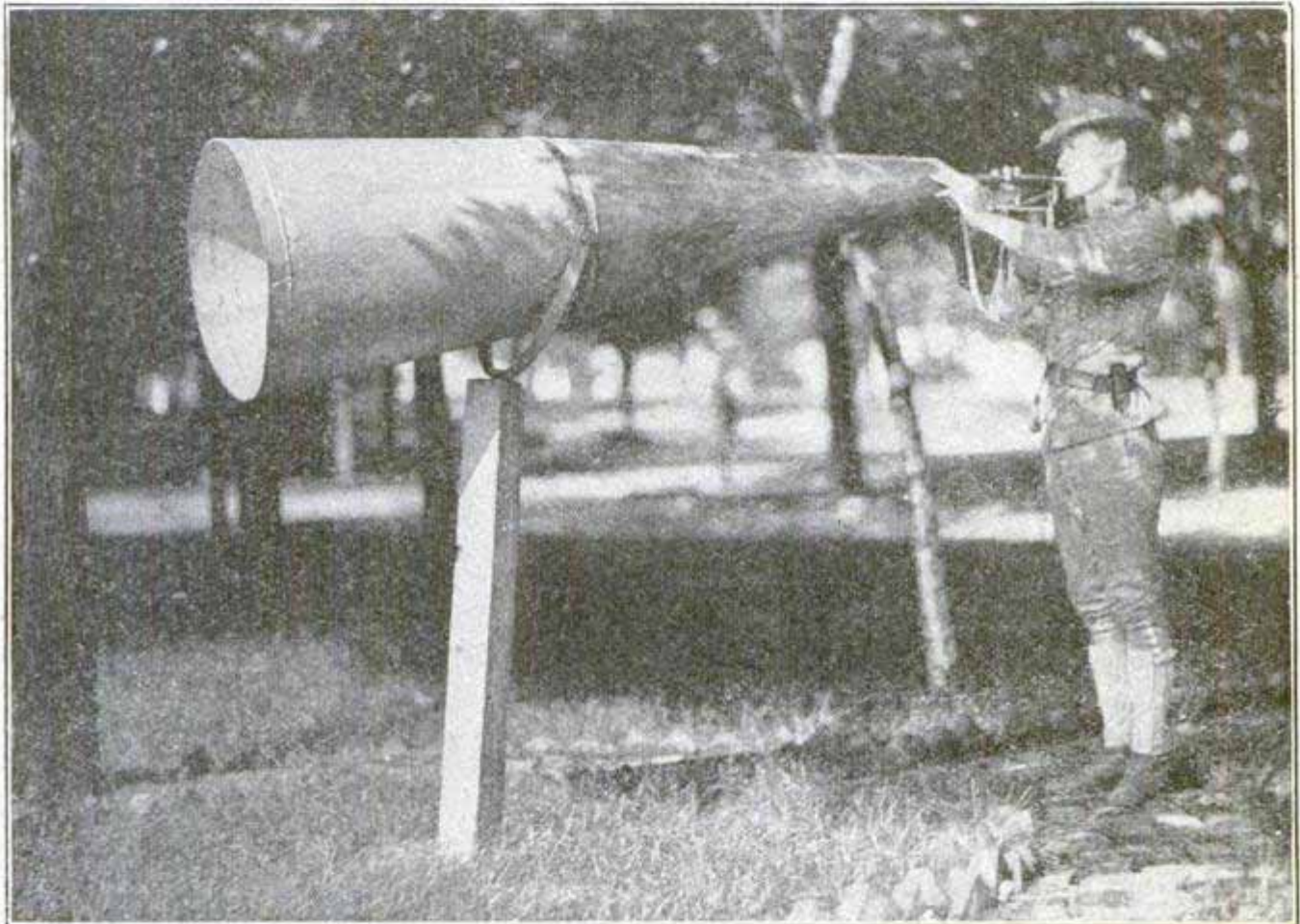
# Popular Mechanics

Written So You Can Understand It

Vol. 12

DECEMBER

No. 6



Magnifying the Volume of Bugle Calls

## BUGLE CALLS THROUGH MEGAPHONES

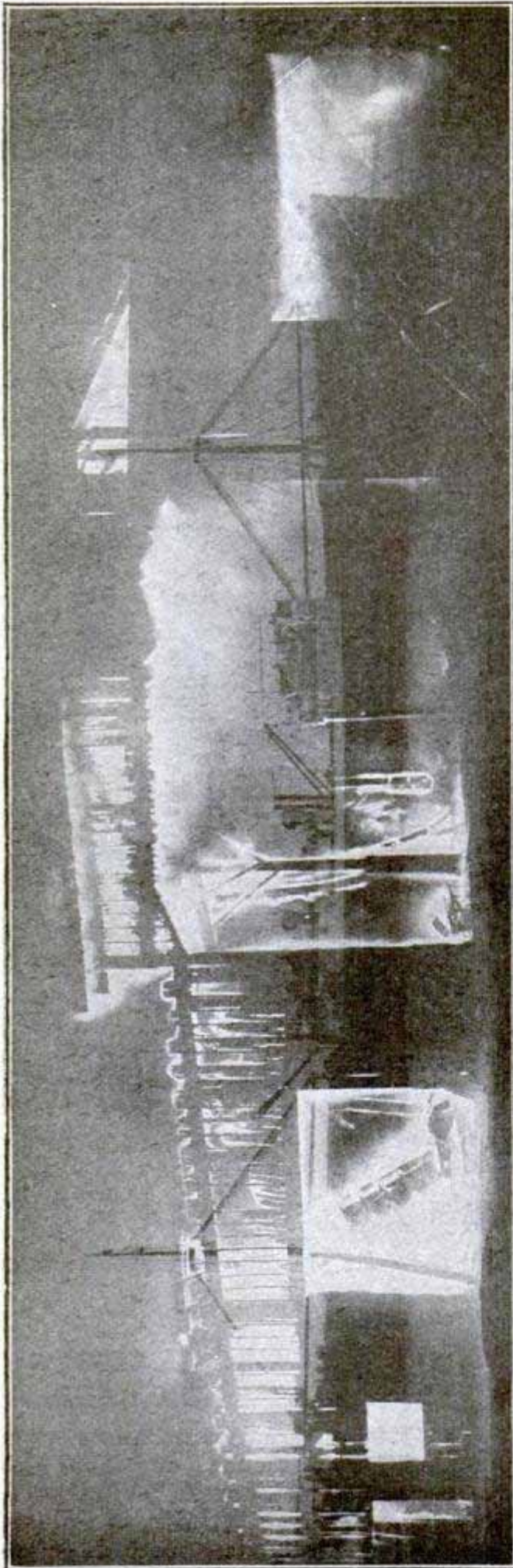
The megaphone, as an adjunct to the bugle, is becoming almost as important in army life as the latter instrument itself. Bugle calls blown through a megaphone carry two or three times the distance of such a call blown in the ordinary way. At western army posts where the sending of bugle calls to distant points is often desired, megaphones and buglers are situated at points about a mile apart,

and the calls are relayed from point to point.

---

## AMERICAN WINS INTERNATIONAL BALLOON RACE

The 1909 International balloon race for the Gordon Bennet cup, held the early part of October in Switzerland, was won by Edgar W. Mix, of Columbus, Ohio. He landed north of War-



saw, the distance, according to the scale of miles on geographical maps, being about 700 miles.

Mix landed in the midst of a large pine tree in the forest of Gutova, and on discovery was turned over to the police, in whose hands he remained until his reason for landing on Russian soil was fully explained and passed upon.

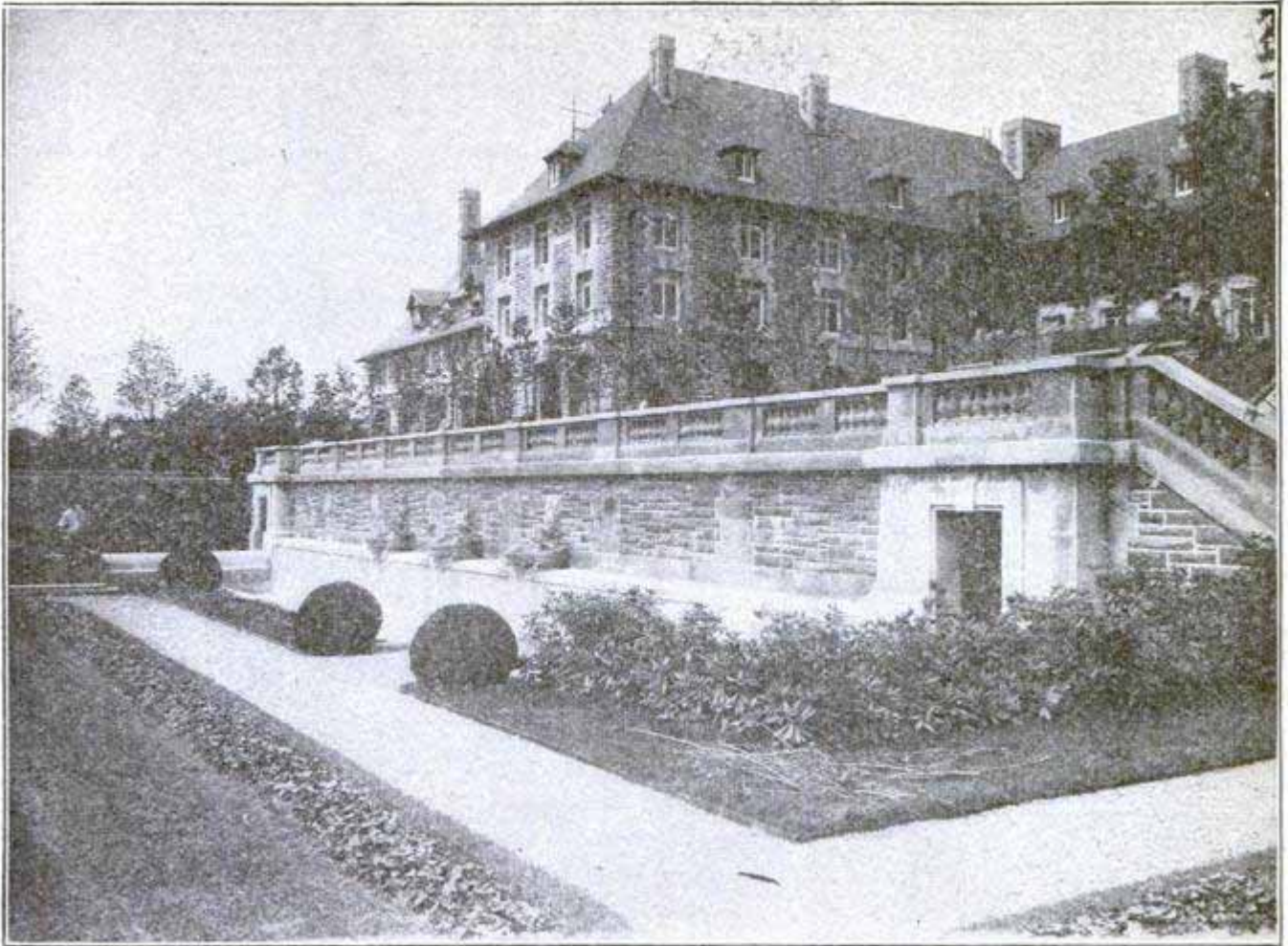
Less interest was displayed over the event this year than in the past few years, the great advance in dirigible airship navigation and aeroplane flights relegating the ordinary balloon to the rear.

### EXTRAORDINARY RESULT OF DOUBLE EXPOSURE

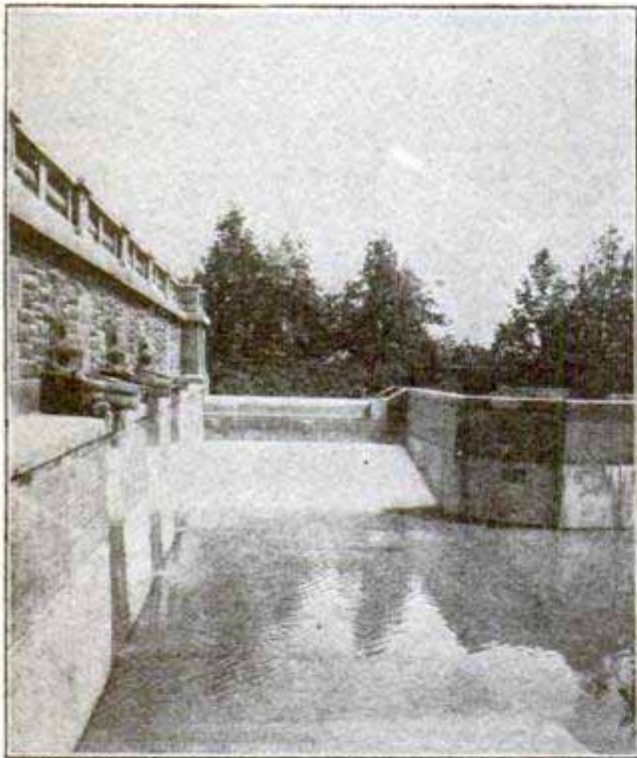
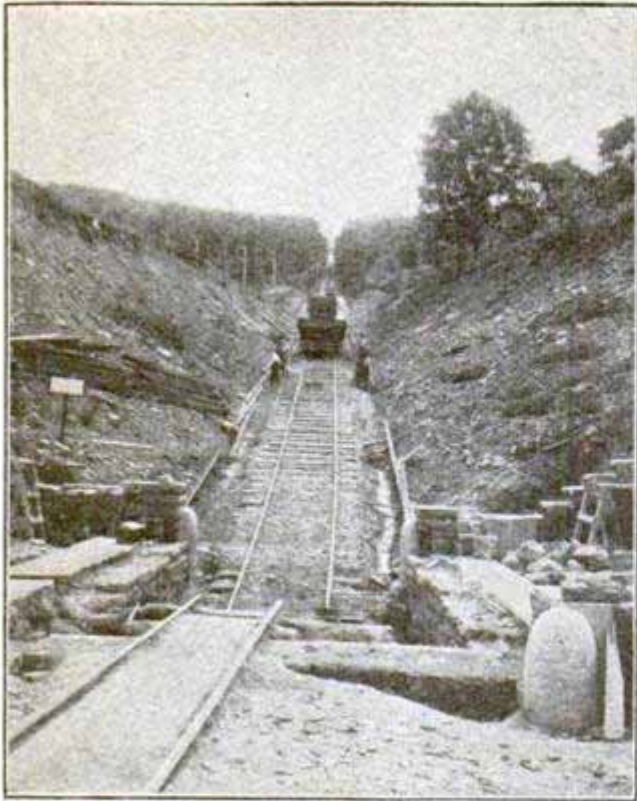
The impression given by this photograph was not intentional with its photographer, M. E. Verkin, of Galveston, Tex. Early in the afternoon he had made an exposure of a ship leaving port, and had left his camera in the warehouse on the pier. In the evening the warehouse caught fire and Verkin rushed into it after his camera, escaping just a moment before the roof fell in. Then he commenced taking photographs of fire, but, excited over his narrow escape, the first time exposure he made was on the plate he had used in the afternoon in photographing the ship. The result was as shown.

### VIEWS OF HARRIMAN'S HOME

Although Edward Harriman was the greatest railroad operator the world has ever known and a tireless worker in his chosen field, he also gave much time and consideration to a more private construction task—that of a beautiful estate, at Arden, in Orange County, N. Y. Views of this estate, which was practically completed before his death, although much work of improvement was yet to be done that might take several years, are shown in the illustrations. In one is the house in which the magnate died, and another gives an excellent idea of its beautiful gardens and the wonderful



Edward Harriman's Home—View Over the River from Gardens



Inclined Railway to Estate—View of the Swimming Pool

outlook over a forest of trees to the river and hills. The inclined railway built to connect his home with the railroad web of the United States, is also shown, as well as a closer view of the swimming pool, which is likewise visible in the foreground of the photograph of the house.

Wilbur Wright broke a record by turning in the air in 18 seconds.

## FRENCH TAXATION OF AUTOMOBILES

On January 1, France will begin taxation of automobiles owned by foreigners, according to their horsepower. Automobiles of not more than 12 hp. will pay \$1; of not more than 24 hp., \$1.40; of 30 hp., \$1.80; of 60 hp., \$2.40. Each additional horsepower over 60 will cost \$3.00.

The French law-makers believe that tax should be paid according to horsepower, as the heavier and speedier the car, the harder is the wear upon the roads.

## PREPARATION OF JEWISH "KOSHER" MEAT

"Kosher" meat, according to many experts, is the most reliable of all meats. The first condition of this meat is that it must come from an animal killed by a shocket. The shocket is an expert meat inspector under the laws of the Talmud, a section of the Jewish civil and canonical law, and can only practice his art when he is accredited by a learned rabbi or has become versed in the law and learned in his handicraft in one of the Talmudic schools, to be found in small numbers in the east of Germany and in Poland.

He seldom carries on any other business than that of a shocket, and even, as a rule, considers it beneath his dignity to assist at the cutting up of the animal killed by him, leaving that business entirely to the butcher. He generally receives for his services to a butcher a fixed salary of from \$40 to \$60 per month, and has a private income through killing for private Jewish families.

It is his duty to kill and examine every animal intended to furnish food for orthodox Jews. He kills by cutting the throat with a sharp knife, then carefully examines the vital organs. If no traces of disease are found, the animal is then "borsted." This consists of the removal of all bloody veins and gristle, which requires a vast amount of labor, not to mention the loss in

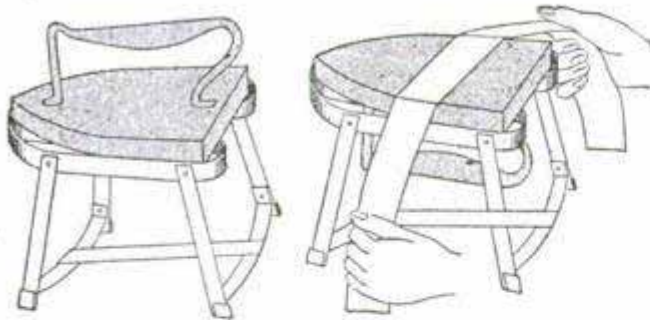
weight caused by the careful cleaning the meat receives before it is put on sale. The blood of any animal is considered unfit food for a Jew, but the heart, lungs, liver, kidneys, etc., are "kosher" if carefully borsted.

The killing knife has a blade about 20 in. long and 2 in. wide, and the cut almost severs the head from the body. It is the law that the animal must be in perfect health when touched by the shocket's knife, and this is the reason that the animals are not made insensible by blows on the head before killing them, as is the general practice.

### "TOPSY-TURVY" IRONING SCHEME

It often happens in ironing neckties, ribbons, and other such articles that it is not desirable to crush them between the iron and the ironing board. Therefore a French inventor has devised a scheme by which the usual method of ironing is reversed, the article being drawn over the iron instead of the iron being drawn over it.

It consists of a holder upon which the iron can be placed upside down. In drawing the article over the iron, only

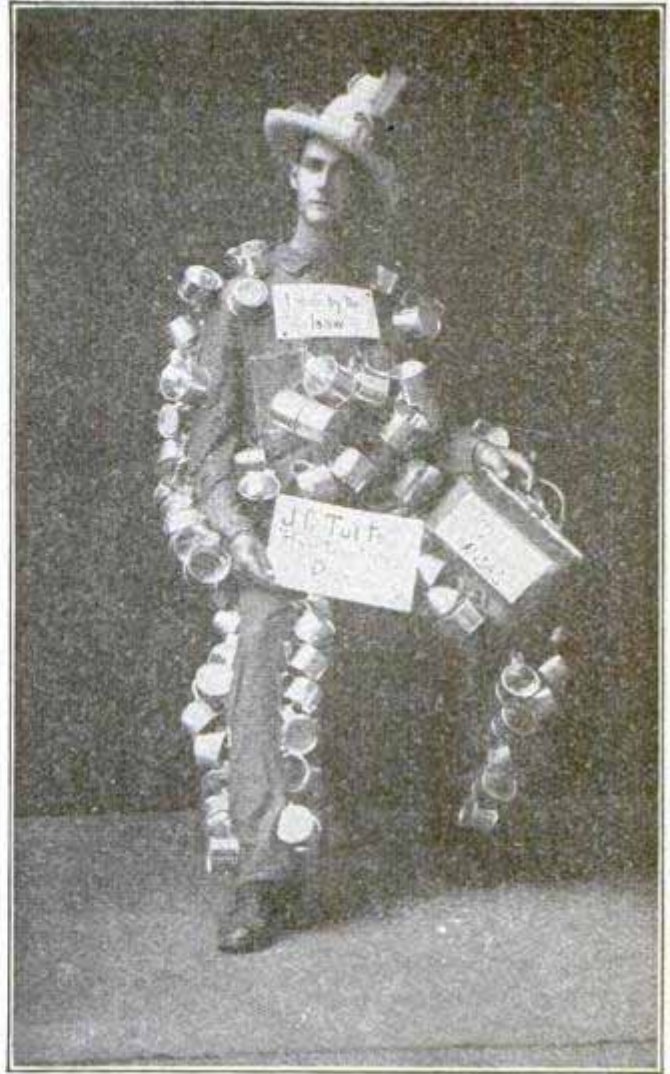


How the Iron Is Used

the side being ironed receives the pressure, and the other side remains free instead of being crushed.

### KANSAS PROHIBITS USE OF COMMON DRINKING CUPS

Kansas has become the first state to abolish the common drinking cup, in a law that states that: "The use of the common drinking cup on railroad



Fun with the Kansas Cup Law

trains, in railroad stations, in the public and private schools, and state educational institutions is hereby prohibited from and after Sept. 1, 1909."

The law thus absolutely sounds the death knell of the tin cup in favor of a fibre cup that must be destroyed after being drunk out of once, or a cup that must be thoroughly washed after each drink, as are china tea and coffee cups. The reason for the law is the fear of infection from cups used by many people.

A somewhat interesting and laughable incident in connection with the enforcement of the new law in Wellington was the manner in which J. C. Tutts, restaurant keeper of that city, utilized it as an excuse for an advertising campaign. He sent out a sandwich-man to whose costume 150 tin cups were sewed, and who bore upon his back, chest, and in his hands, placards of an illuminating nature.

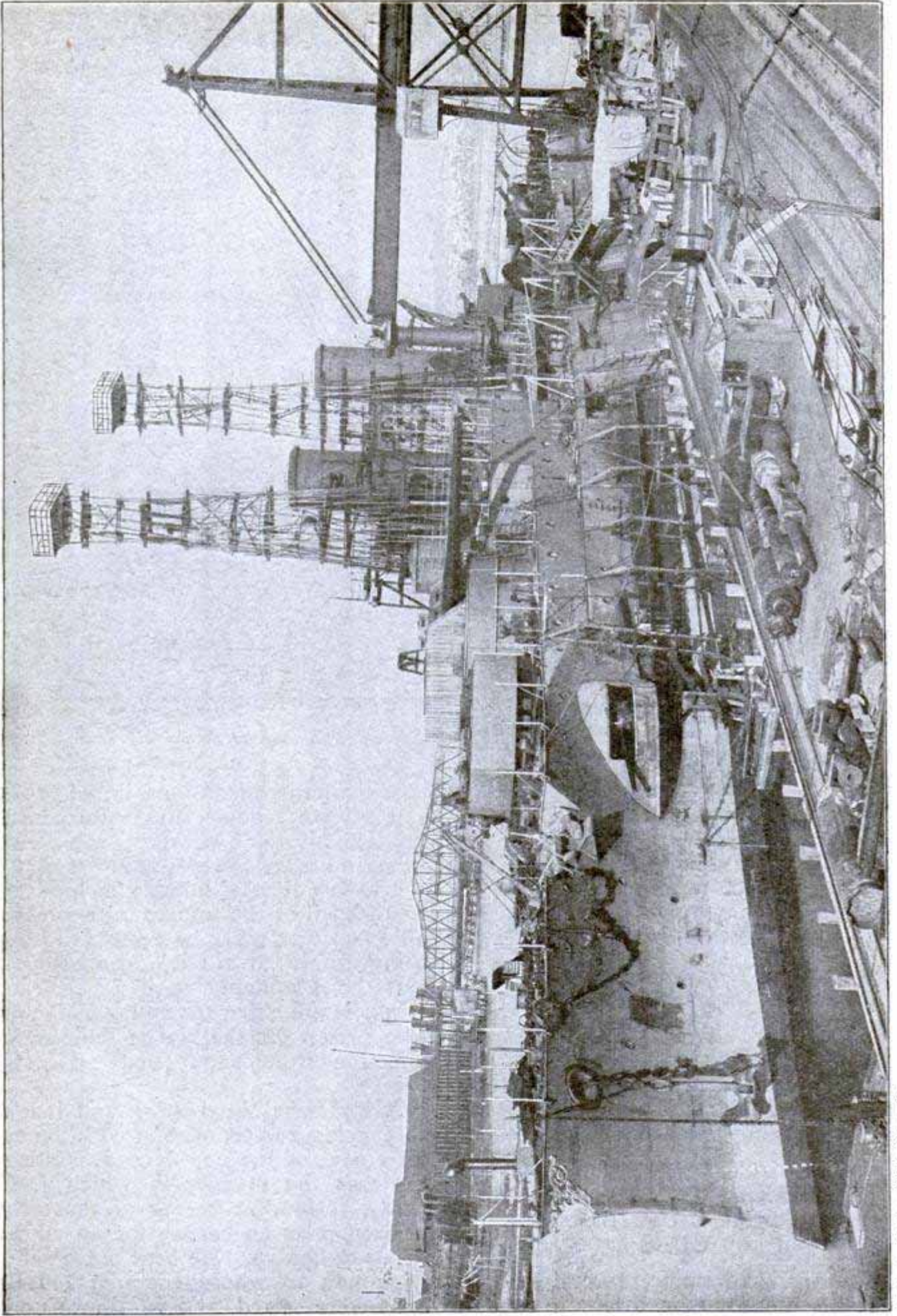


Photo by Boston Photo News Co.

The Nearly Completed "North Dakota"



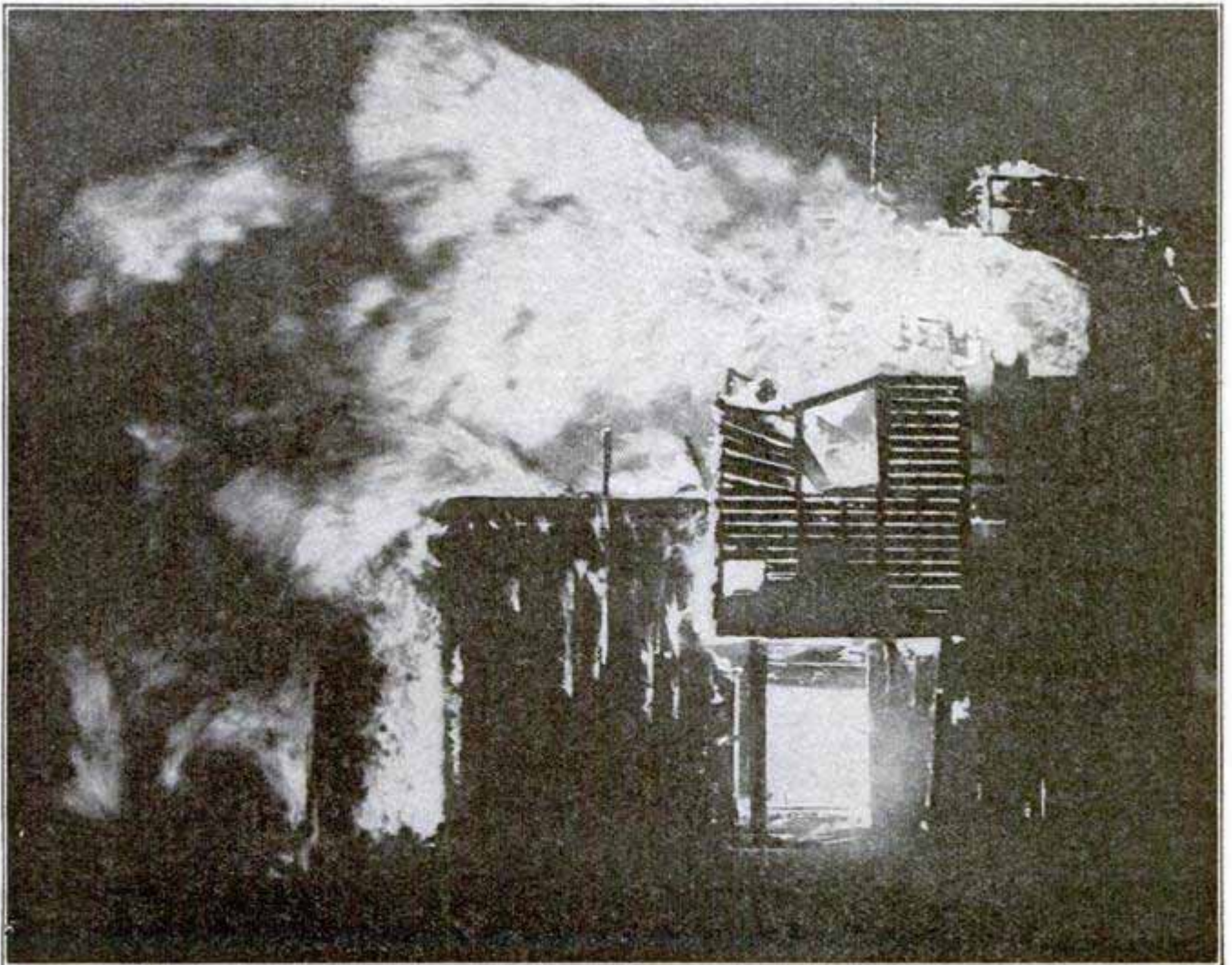
### THE FIRST COMPLETED U. S. "DREADNOUGHT"

The U. S. S. "North Dakota," the first of the American "Dreadnoughts" to be ready for battle, is shown in this illustration, 94 per cent completed. Practically all that remained to be done at that time was the affixing of the armor of No. 4 and No. 5 turrets. She has a displacement of 20,000 tons, and was built for a speed of 24 miles an hour. Two of the big guns are clearly visible just forward of the first fighting-top.

### BURNING OF ABANDONED WATERWORKS CRIB AT CLEVELAND

This picture was taken in pitch darkness four miles out in Lake Erie. It shows the destruction of Crib No. 2

which was used in the construction of the Cleveland waterworks tunnel. The crib had served its purpose and complaint was made that it was becoming a menace to navigation. The city ordered it removed. The contractors to whom the work was awarded decided to burn the superstructure and dredge out the foundation. The immense hulk which contained more than 3,000,000 ft. of lumber, was saturated with barrels upon barrels of oil and gasoline. Every available space was packed with oil waste. In ten minutes from the time the torch was applied the entire mass was a raging furnace of flame. In two hours there was nothing left of the superstructure, and one by one the embers hissed and went out at the water's edge. A throng of people watched the unique illumination from the shore and a procession of boats formed a naval parade about the roaring pile.



Waterworks Crib Makes Splendid Bonfire



Supported by an Auto Tire

### NEW USE FOR AUTO TIRES

Both old and new automobile tires became very popular at continental watering places last season as swimming accessories. Rigidly inflated they make a much more satisfactory article to dive through or support oneself with than the ordinary life preserver or swimming bags.

### ENGINEER FOR 51 YEARS CONTINUOUS

In a recent issue the record was given of Albion B. Smith, a railroad engineer who had been in service for 40 years, and who was believed to be the oldest active locomotive driver in the United States. He now has a contestant for the honor in James Farley, an active engineer on the Missouri Pacific who entered its service in 1852. In 1858 he was promoted to position of engineer, and has held it ever since, a period of 51 years.

### RAILROAD BRIDGE OF NOVELTIES

A railroad drawbridge, spanning the Missouri river at St. Joseph, Mo., was constructed with extension cross sills for a wagon drive on each side of the single track, but owing to the fact that wagon traffic has been easily handled on one side, the other was never completed. After several years of operation in this manner, however, it has been discovered that the weight of wagon traffic on one side, as opposed to the lack of weight on the other, has over-balanced the bridge to such an extent that the swinging of the draw span is unsatisfactory. Consequently the railroad company has now erected several wooden cribs 20 ft. long by 3 ft. wide, and deep enough to hold 6 tons of crushed stone each, on the uncompleted side to serve as a counter-balance.

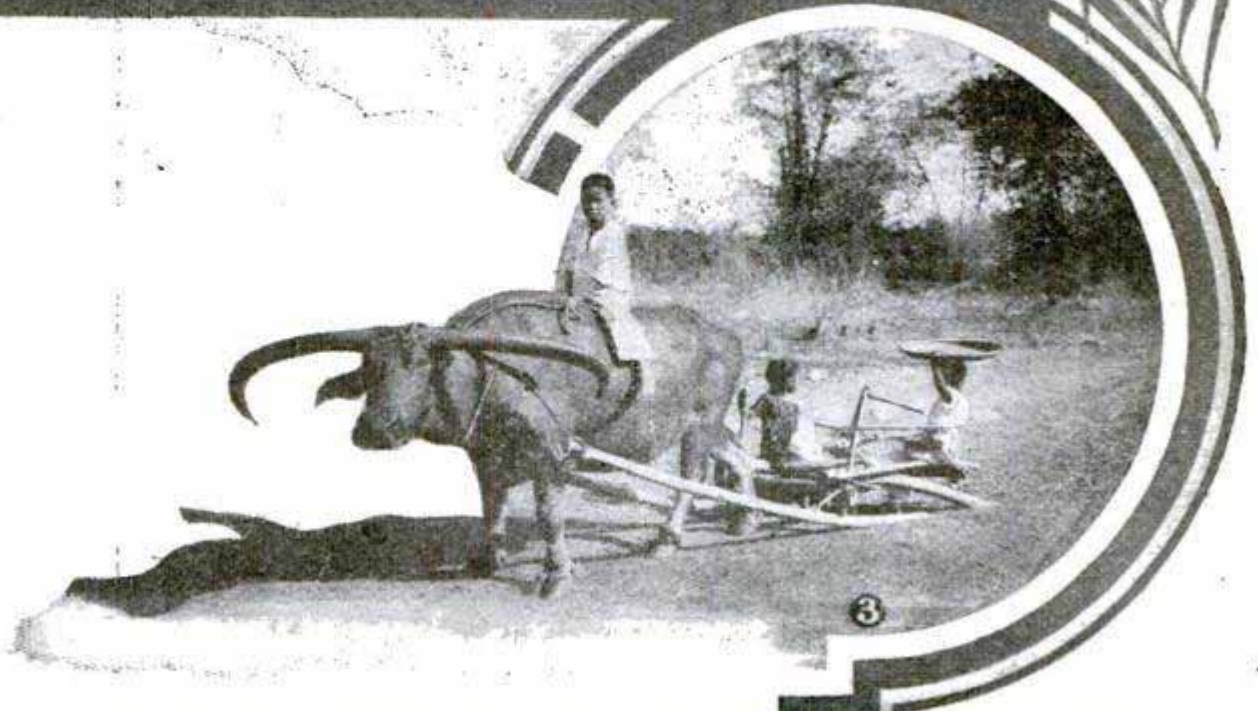
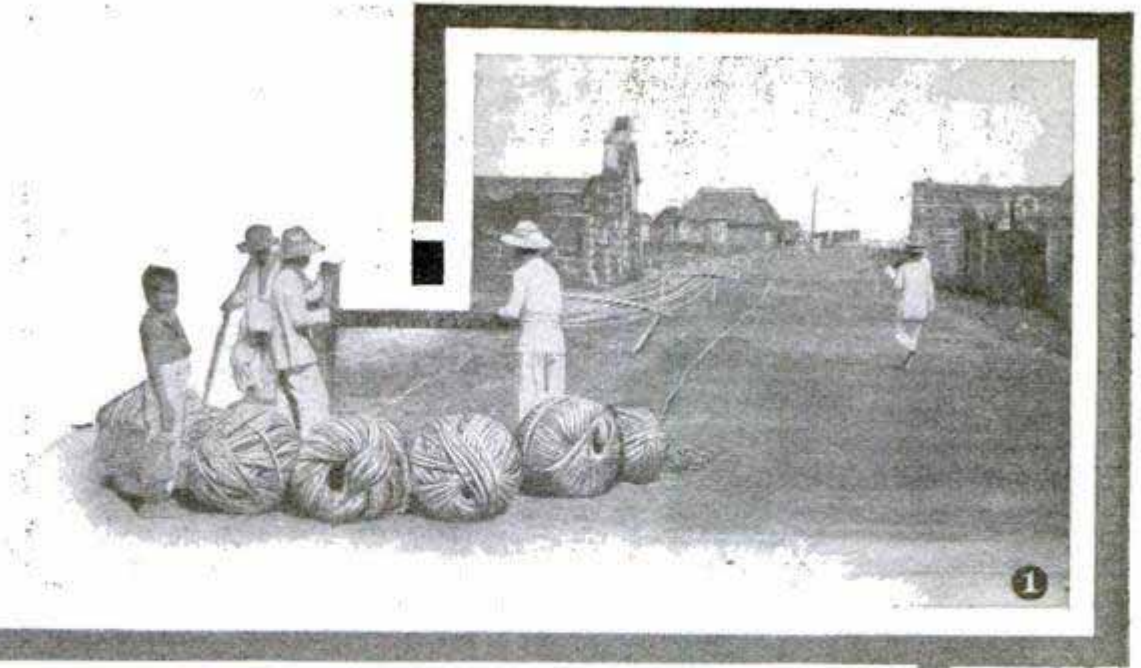
### PRIMITIVE OCCUPATIONS OF THE FILIPINOS

While the Filipinos to a great extent still follow primitive methods in their work, there is, nevertheless, a touch of cleverness about them when the means at hand are taken into consideration. The illustrations clearly show this.

In picture No. 1. is an old-fashioned rope walk with the rope-makers busy at work. It is located on the outskirts of Manila, where one might expect to find an up-to-date factory. In reality there is one located near it, with all modern machinery and implements, but as yet the rope walk continues to exist.

A crude sugar refinery, capable of turning out large quantities of roughly refined sugar for native consumption, is shown in No. 2. It is conducted by Chinese, as is the majority of such refineries in the islands.

Photograph No. 3 is a carabao sled, with the animal attached. The sled is made of bamboo, and it is with such vehicles that the poorer families haul supplies and travel from place to place. No. 4 is the laborious method by which the Negritos, a mountain tribe inhabit-



No. 1, Philippine Rope Walk—No. 2, Crude Sugar Refinery—No. 3, Carabao and Sled

ing southern Luzon, grind rice. The receptacle which holds the grain is dug out of hard wood. The rice is



No. 4, Grinding Rice in the Hill Country—No. 5, Primitive Weaving Stand

tamped with bludgeons, two or three children usually working at the same time.

In towns and cities, looms and other modern machinery is used to some extent for the spinning and weaving of hemp, but the hill women still use the crude means shown in Fig. 5. Her

child is shown sleeping on her back as she works. No. 6 shows a more pretentious rice mill than that in No. 4. It is the kind used in the towns, and although much superior to the pestles of the hill tribes, it is crude.

One of the ferries that ply on the many canals of Manila is shown in No. 7. It carries passengers from one bank of the canal to the other, one cent per head being the charge. The government is now building bridges across many of the canals, but the owners of the raft-ferries still pole their crude craft at a profit.

The pottery market, shown in Fig. 8, is usually a very busy place. The only cooking utensils used by the natives are made of clay, and consequently the sales are numerous, the wares retailing at prices ranging from 10 to 30 cents. The utensils are made by Filipino and Chinese potters.

### KISSING THROUGH DISINFECTED SILK GAUZE

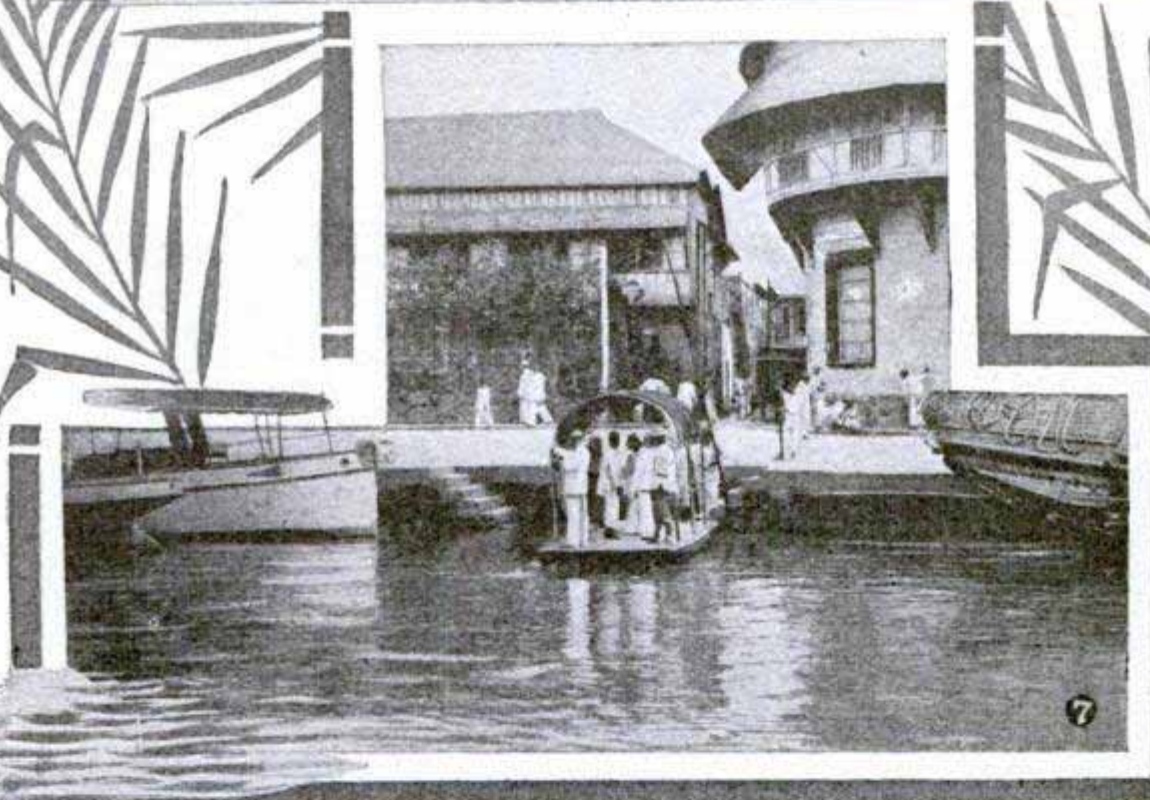
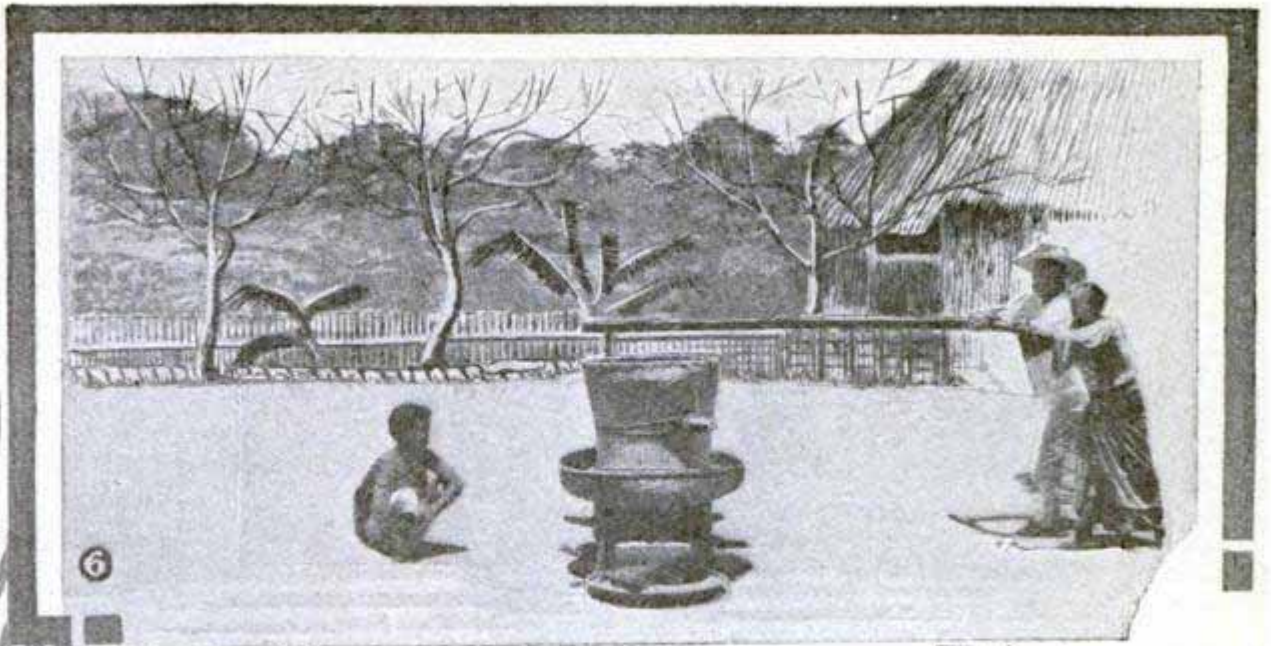
A German inventor has devised the little contrivance here shown to prevent infection from kissing. It is made of silk gauze, in an ivory or metal frame. The gauze is soaked in disinfectant, and to this is added the scent of roses, cloves or peppermint.

It is more of a joke than a serious invention, so also are the stories being published in many European newspapers concerning American children who are wearing hat bands with the words "don't kiss me" upon them, the



Sanitary Kisses

idea being to prevent the infection that may come from promiscuous osculation.



No. 6, Rice Mill of the Towns—No. 7, Canal Ferry in Manila—No. 8, Where Pottery Utensils Are Bought

### UNIQUE DOG TEAM

The owner of this unique dog-propelled vehicle, which he calls a "dogo-mobile," has traveled 10,000 miles with



10,000 Miles by Dog Team

the aid of his dogs. The dogs, as the illustration clearly shows, are hitched to the rear and push the cart, while its occupant steers by means of a handle attached to the front wheels.

### ENGLAND OWNS WIRELESS STATIONS

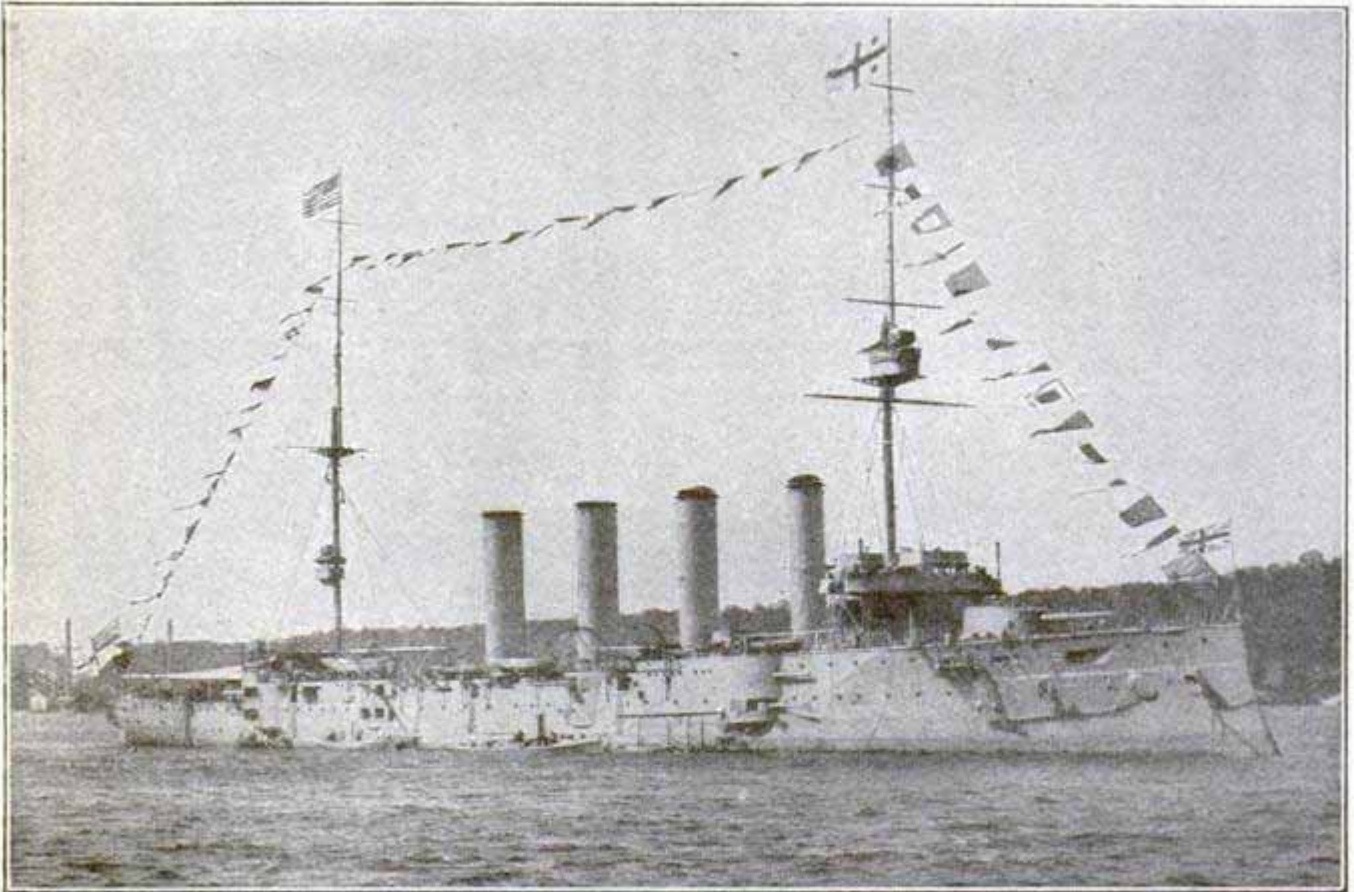
The British government has bought all the coast stations of the Marconi wireless system in England, with the exception of the long-distance stations at Poldhu and Clifton, for a consideration of \$75,000. The government also gets the right to use all existing patents and all improvements made during the next 14 years.

The two long-distance stations are kept by the Marconi company for its trans-Atlantic service. The rest of the system will be under the control of the postoffice department, and the stations will be opened for communication equally with all ships, irrespective of their wireless system.

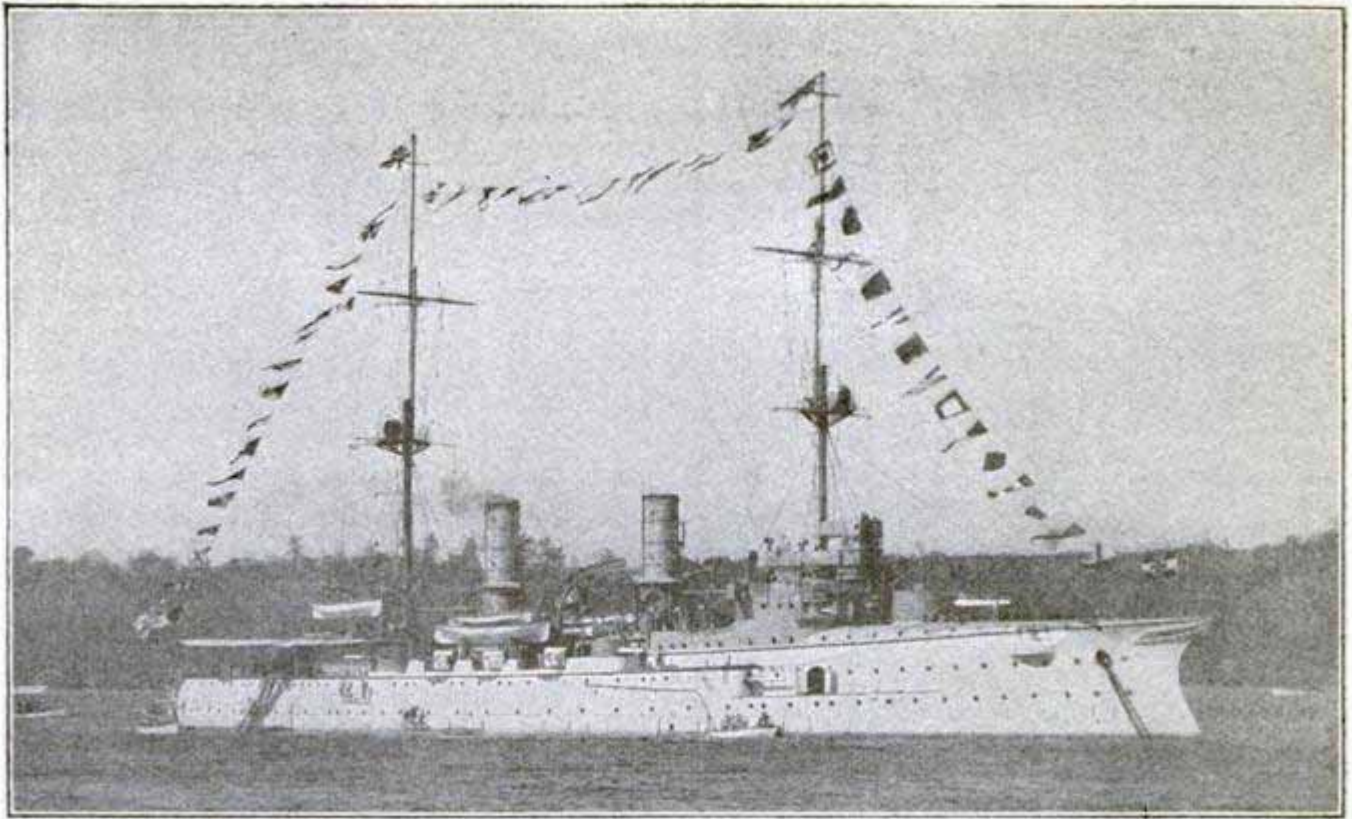
### STRANGE WARSHIPS IN AMERICAN RIVER

During the Hudson-Fulton celebration 16 foreign warships, one of which

at least is more powerful than any American battleship yet launched, rode



English Warship "Drake"

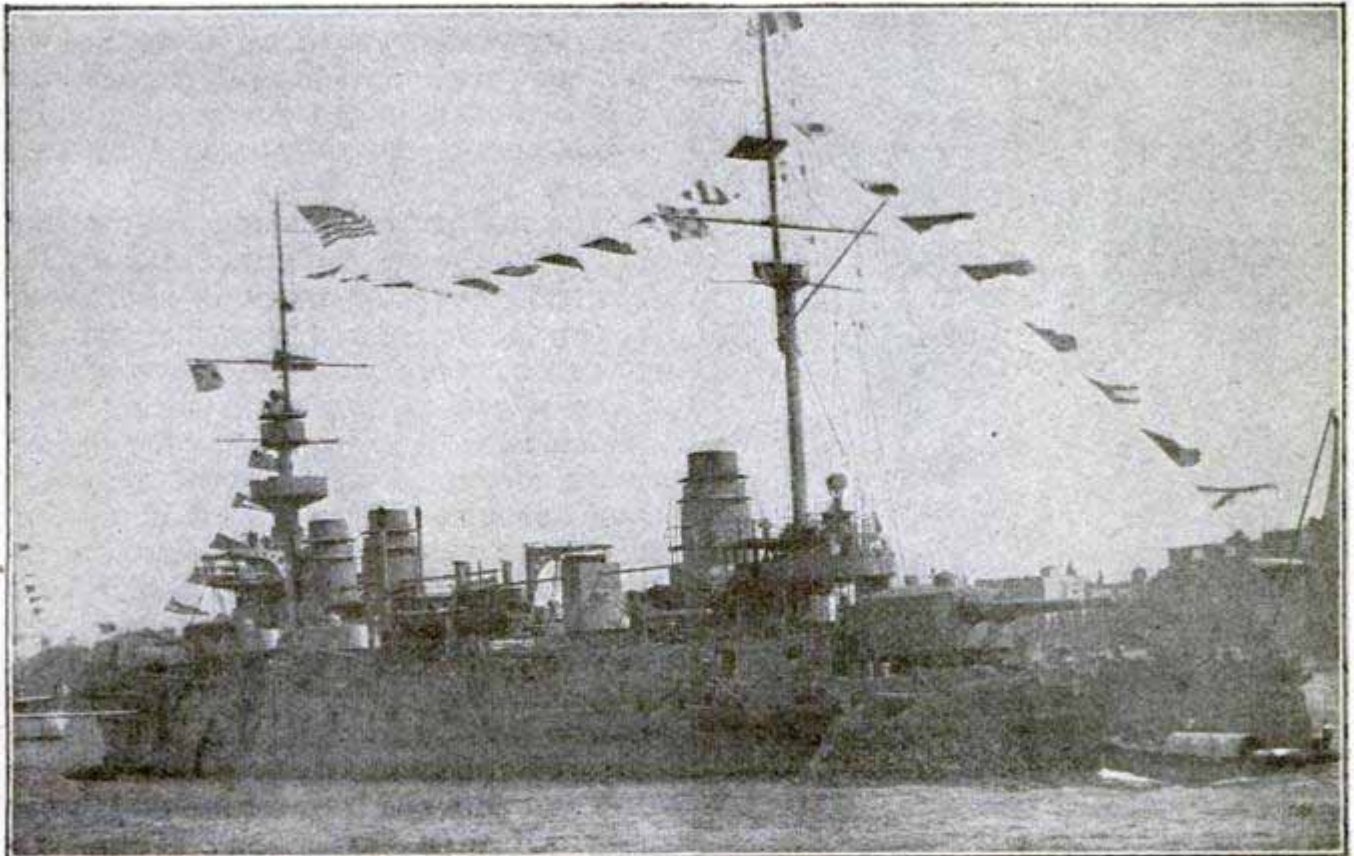


The German Representative "Dresden"

majestically on the waters of the Hudson river as the representatives of seven governments. Four of these fighting ships were British, four were German, three were French, two were

Italian, and the others represented Holland, Mexico, and Argentine.

The accompanying illustrations show the English "Drake," the German "Dresden," and the French "Liberte."



The "Liberte," Representative of France

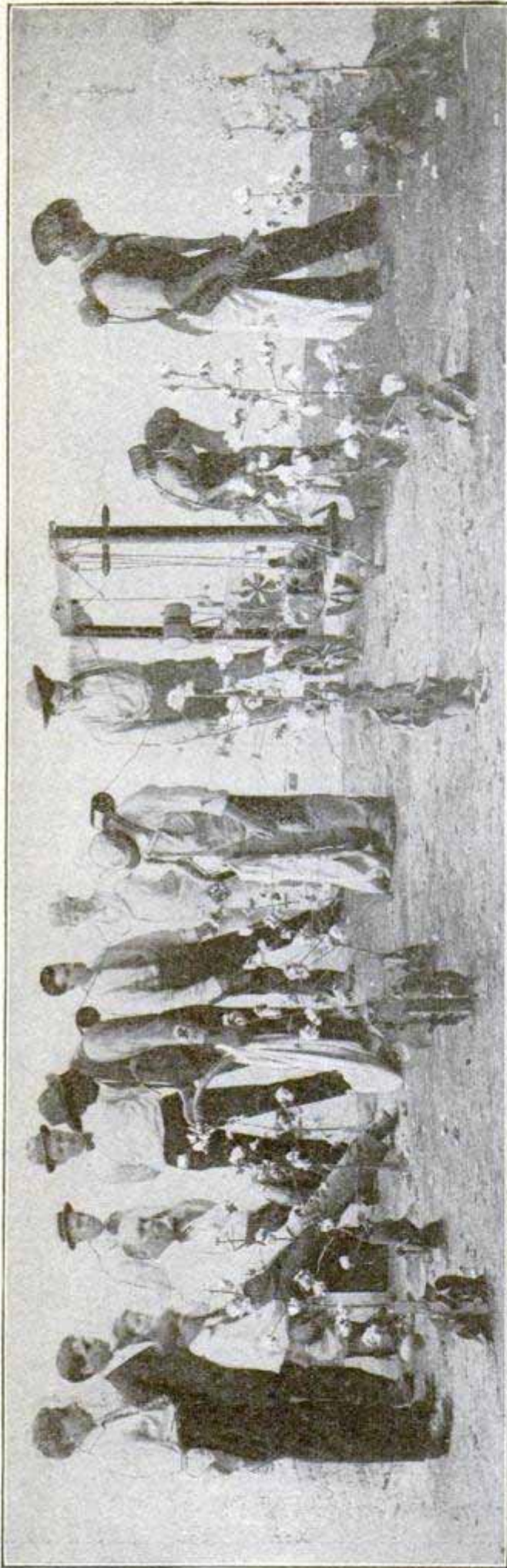
### PICKING COTTON BY ELECTRICITY

An inventor of Augusta, Georgia, familiar with conditions in the cotton fields of the South, has designed a mechanical cotton picker which is believed, from experimental tests, to be successful.

The great difficulty in devising a practical cotton picker is the fact that cotton, unlike the majority of crops, does not ripen consistently and therefore the fields must be gone over several times, and each time carefully so that the unripe cotton may not be injured, instead of in one plant-destroying harvest as is the case in the gathering of grains.

A machine, therefore, to be successful must almost have the human power of reasoning, by which to select the ripe cotton and leave the unripe, and it is the fact that this machine does not do away with this human reasoning that constitutes its claim for success. Unlike previous inventions for picking cotton, it does not aim to do away with picking by hand, but simply to make such picking about 10 times as rapid. It consists of a central plant on wheels for generating electricity, from one to 20 lines of electric wires, a small motor for each wire carried on the back of a negro picker, and a revolving picking tooth and conveyor operated by each negro.

The method of working the machine is clearly shown in the illustration. The electric generator truck is sufficiently narrow to be pushed along between the rows of cotton, and the wires leading from it are contained on spring reels, which allow it to run out as the pickers work further away from the generator and automatically winds it in as they approach closer. The motor on the negro's back is too small and light to be cumbersome or heavy, and the picker and tube conveyors weigh but  $1\frac{1}{2}$  lb. This picker is applied to a ripe cotton boll by the operator, a button is pressed and the tooth grips out the cotton and conveys it to a tube which carries it into a bag swung around the shoulders. The picker robs the boll of





its cotton instantly it is applied, and it is this rapidity that constitutes the machine's claim as a labor saver where many other devices have failed.

in the winter good skating is possible, if the canal is located in a section of the country where the temperature falls sufficiently to freeze.



One Pleasure Afforded by Irrigation Canals

### IRRIGATION CANAL AT HIGH WATER

Aside from its mission of providing otherwise arid or semi-arid land with great drinks of crop-producing water, the irrigation canal affords several means of amusement for the people fortunate enough to live near it. This illustration shows a western irrigation canal at high water, with three boys of the neighborhood afloat on its smooth surface in a boat of their own construction. Such canals also afford opportunity for fishing in a small way, and

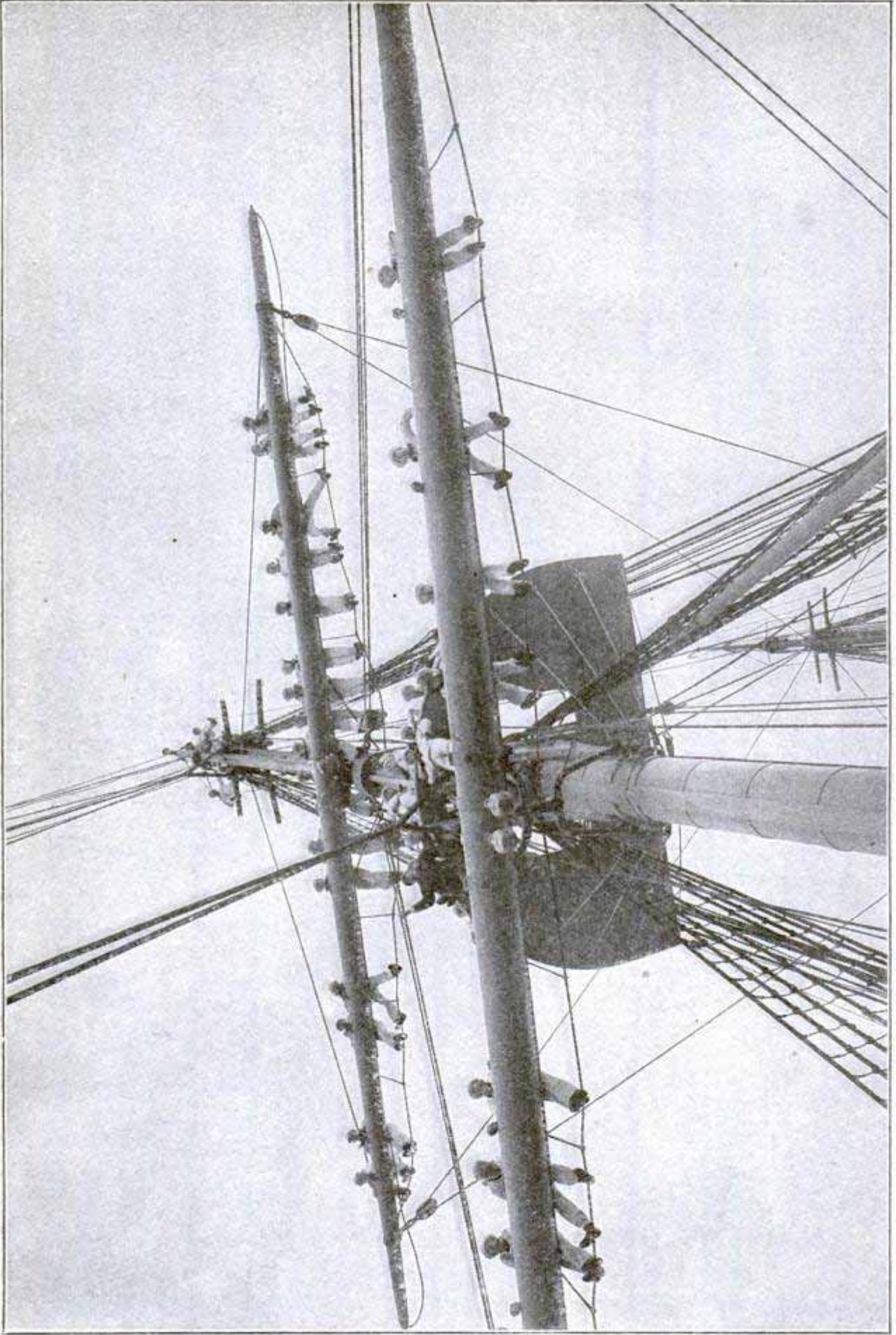
### CLOUDBURST STRIKES RAWHIDE, NEVADA.

On the evening of Aug. 31, a cloudburst struck Rawhide, one of the famous mining towns of Nevada, with the result shown in the illustration, which gives an entirely novel and unnatural idea of its main street with the water 3 ft. deep.

Six months of the year Rawhide is without a drop of rain, but when it does come, the citizens of that community do not relish it in quite such large quantities.



Rawhide's Main Street Converted into River



LIFE IN OUR NAVY—No. 5, On the Training Ship "Constellation"

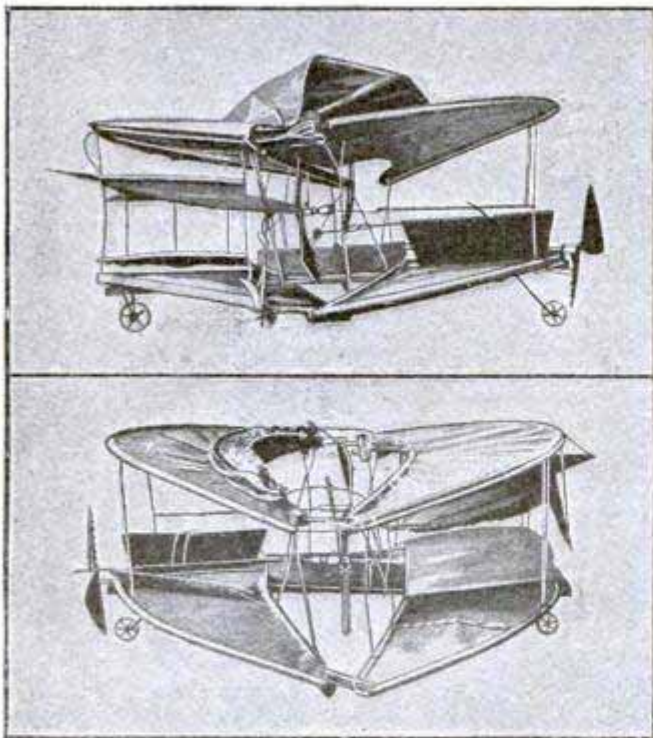
## HONOR HENRY HUDSON'S CONTENDER

Less than a week after the Hudson-Fulton celebration nearly 20,000 Italians, of New York, smothered in flags, bunting, and gay uniforms, paraded down Broadway to the Battery and unveiled a statue of Giovanni de Verrazano, whom historians describe as the first trans-Atlantic voyager to arrive in New York harbor.

With no intention to belittle Henry Hudson's achievement, Italians maintain that Verrazano discovered the Hudson in 1524, or 85 years before the "Half Moon's" arrival, but the Florentine navigator left no detailed report of his exploration of the river. On this account he has received but little recognition in America.

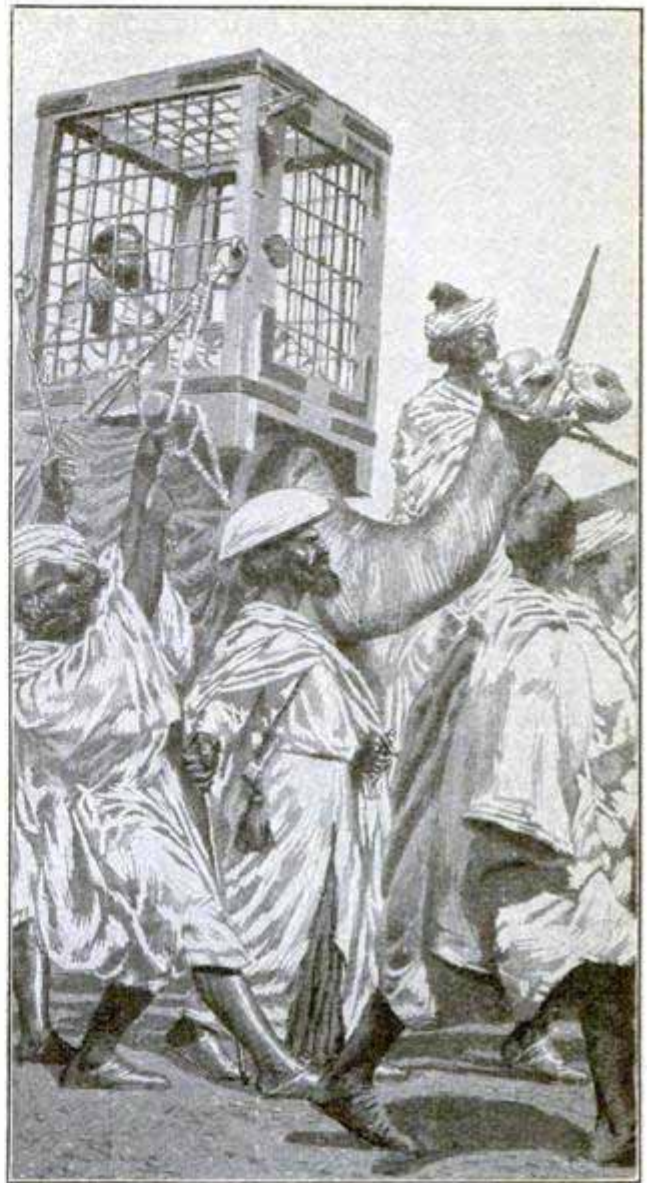
## AEROPLANE WITH PARACHUTE HOOD

In an endeavor to add to the chances of safety in aerial flight, a European inventor has devised an aeroplane parachute hood to be brought into action should an accident occur and the machine start to fall. The illustrations



The Safety-Hood in Action—Folded Aside  
During Flight

show the hood in position for descent and how arranged during flight.



First Stage of a Horrible Torture

## THE HORRIBLE DEATH OF MOROCCO'S PRETENDER

The torture and execution of El Roghi, pretender to the throne of Morocco and most feared enemy of the present Sultan, Moulai Hafid, was as horrible as any act perpetrated in the Middle Ages, that period in which such atrocities were given full sway. For four days he was exposed to the people in a cage, as shown in the illustration. The photograph from which it is reproduced was taken while the pretender was being brought to Fez on a camel's back.

Following the period in which he was exposed to the jeers and missiles of the public in front of one of the gates of the palace he was placed in prison and constantly tortured in order to make

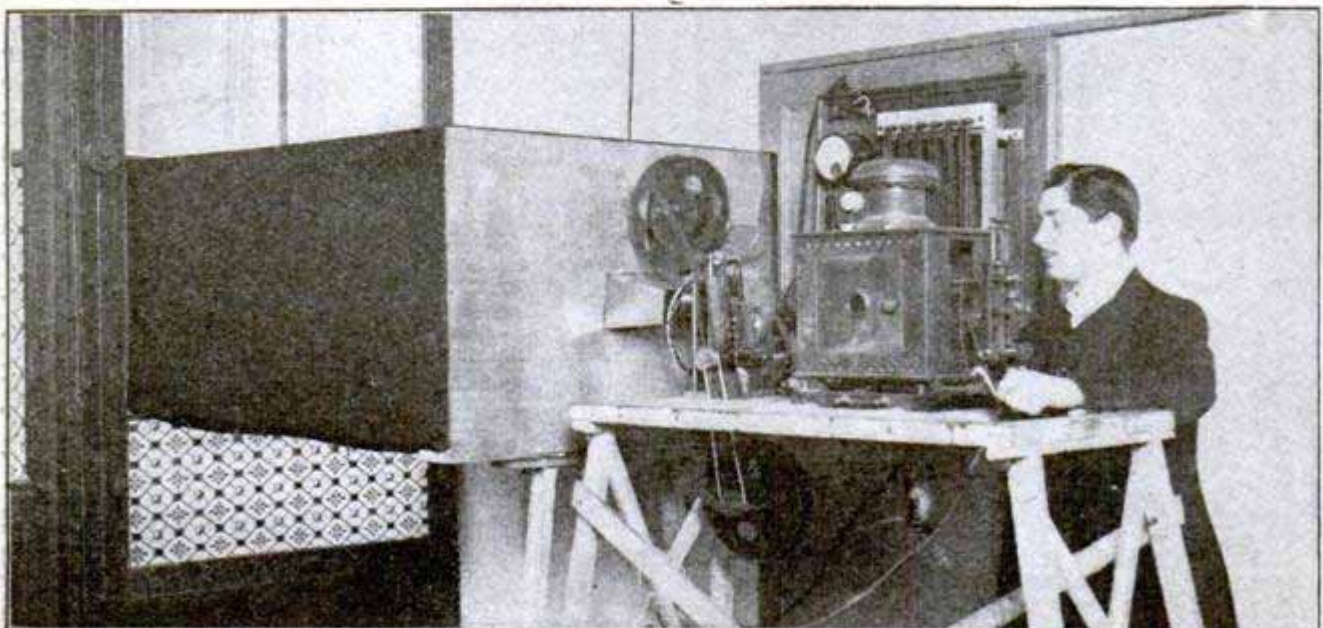
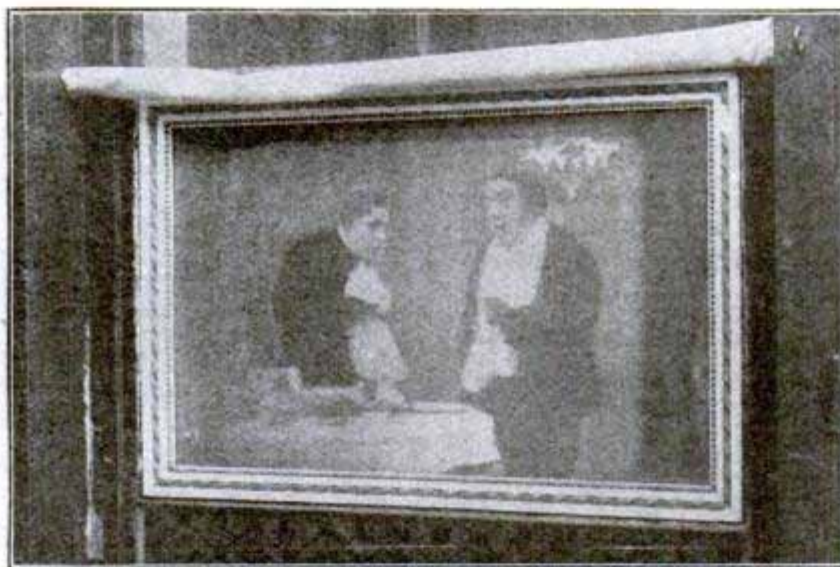
him disclose his supposed hidden treasure. Then, after the European consuls officially protested against such cruelty to the Sultan's very face, he caused El Roghi to be disemboweled alive and his remains, limb by limb, fed to the animals in his menagerie.

The details of the execution differ to some extent, some writers insisting that the Sultan personally thrust his victim into a cage of lions, removing him after his arms had been eaten off, then saturated the still live body with oil and burned him up. Other reports say that his head was bent back and molten lead poured into his nostrils. In the main, however, the story of his disembowelment alive is officially considered correct.

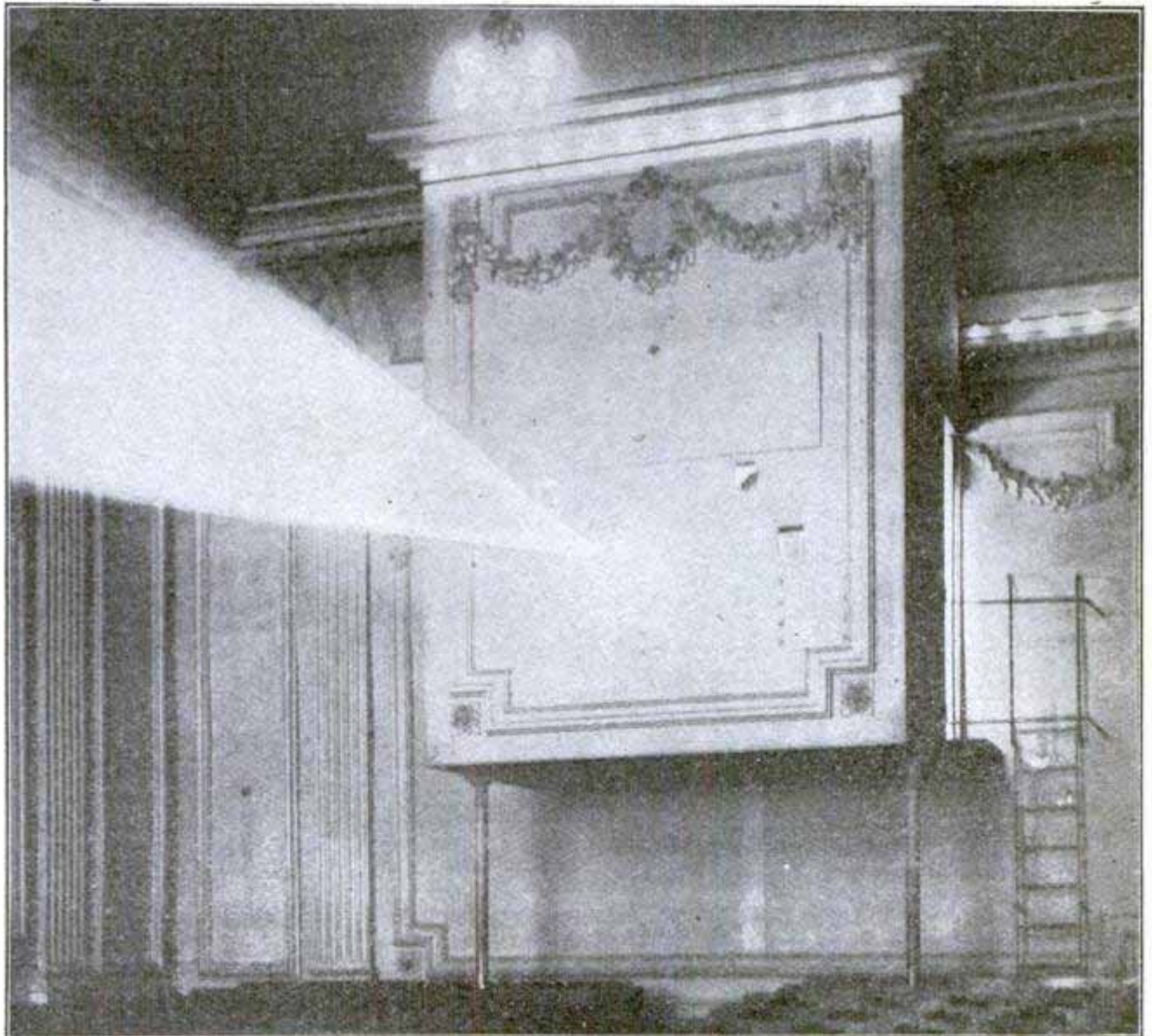
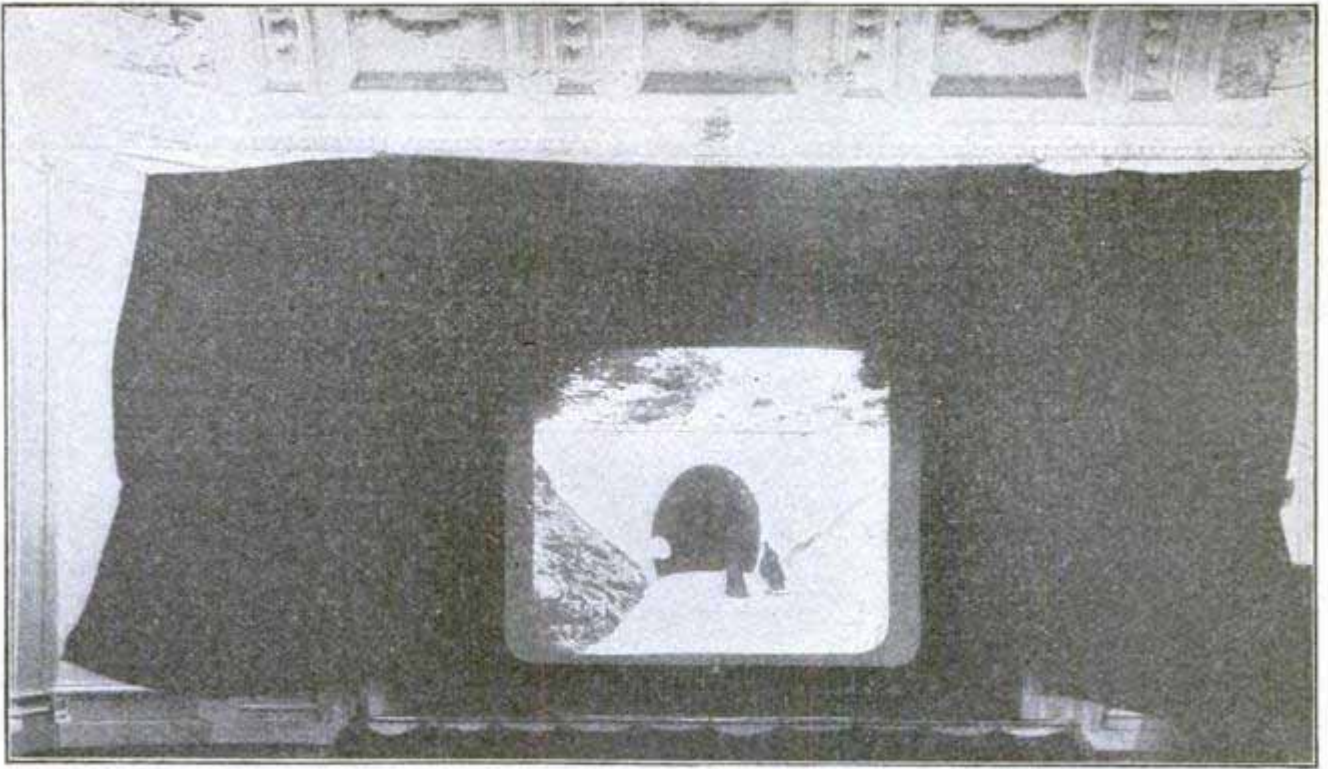
## MOVING-PICTURES IN BROAD DAYLIGHT

That the total darkness in which the spectators of a moving picture show sit during a performance is not necessary is graphically shown by these illustrations of two such amusement places in Paris where broad daylight is allowed to enter during the day and electric illumination is present at night.

The two systems shown are the arrangements of two different Parisian inventors who were impelled by the knowledge that the necessity of darkness, which is the most disagreeable feature of such shows, would have to be overcome before complete success



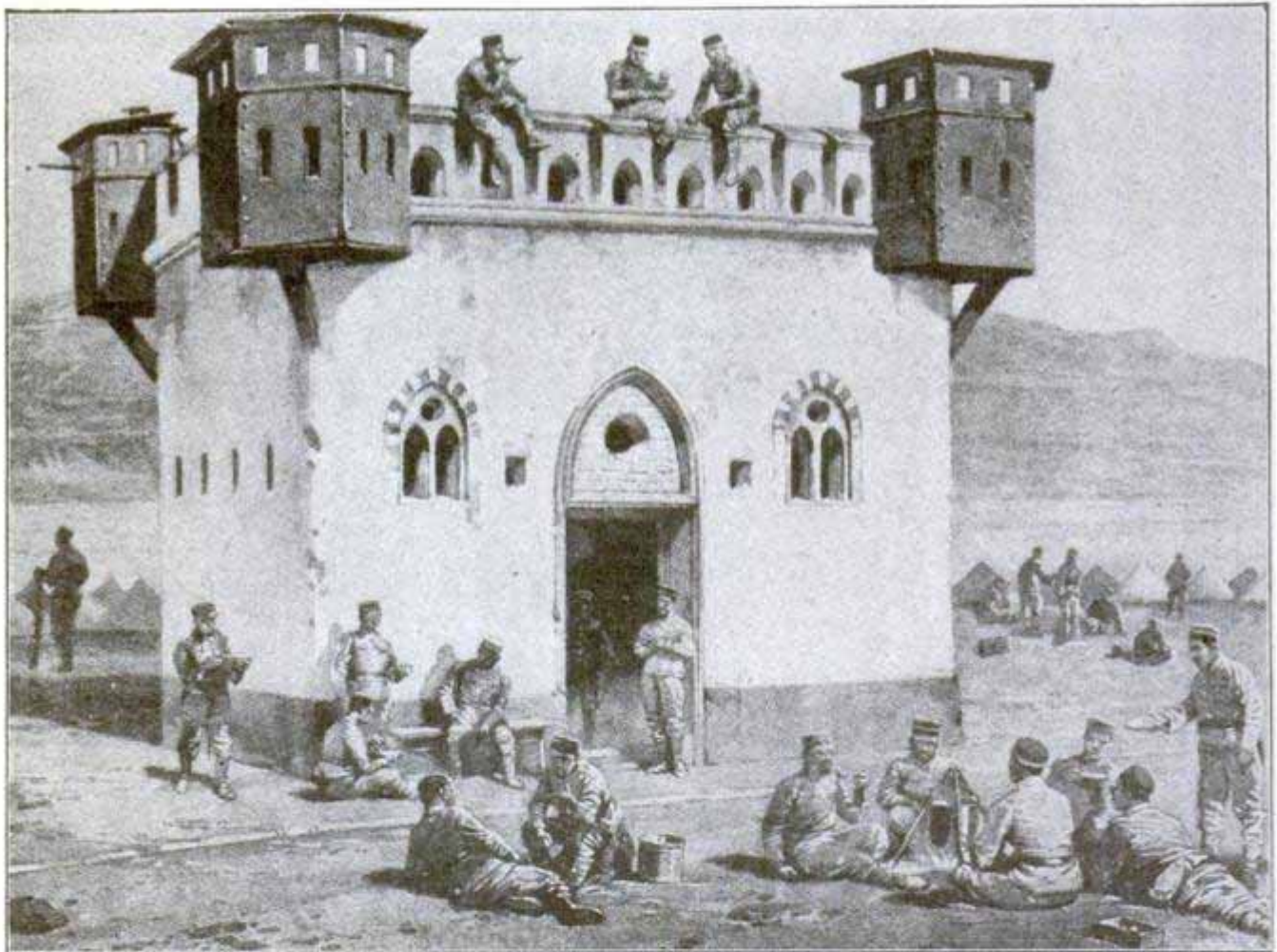
Projecting Moving Pictures in Daylight, Second System



Projecting Moving Pictures in Daylight, First System

were possible. The first system, shown in two of the illustrations, does not differ materially from that of the ordinary apparatus as far as the position of the screen and picture machine are concerned. The screen is painted white and very slightly tinted in rose, and dark curtains, hung a short distance in front of it, protect it from the light of the stage and the electric clusters and ceiling lights. The spectators see the pictures as clearly as though the theatre were in darkness, the eyes are not fatigued by the glare on the screen as is the case when the spectator sits in darkness, and it is possible to read a book or paper if bored by the set of pictures being shown.

In the second system, as is shown by the first and second illustrations, the picture machine and operator are located on the stage behind the screen. A dark room or box is formed between the machine and the screen, through which darkness the pictures are projected. The screen in this instance is an unpolished pane of glass, the rough side turned toward the spectators. This translucent glass is only illuminated from behind, and its unpolished outer surface, in some instances aided by a second pane of glass, slightly smoked, keeps the illumination from the auditorium of the theatre from interfering with the clearness of the scenes projected.



Fort with Boiler-Plate Armor

### CURIOUS SPANISH FORT AT MELILLA

The forts used by the Spanish force at Melilla as a protection against the Moors are a curious combination of the ancient and modern blockhouse. The

main portion is of plaster, converted into a defensive stronghold by boiler-plate fighting-tops at each corner of the roof.



Snow Scene in North Dakota, Railroad Drifted Over Shortly After the Snow Plow Had Passed

### MACHINE RENEWS RAILS WHILE IN USE

According to the U. S. consul at Sydney, an Australian inventor has designed a machine that is being successfully used for prolonging the life of street car tracks. It is known as a rail-planer, and its work is to restore a rail to its original level and evenness of surface. One of the contracts of the concern manufacturing the machine calls for the deepening of the groove in the flat rails in which the flange runs, and the reduction of the narrow outside lip to the level of the rest of the rail. All this will be done in one operation as the machine moves forward on the track. Accuracy of cut with the moving machine on an uneven track is secured by the adoption of self-adjusting machinery.

The claim of the inventors of the machine is that by restoring a rail in this manner the cost of putting down a new

rail is postponed for many years, and the inconvenience that follows the tearing up of the track is obviated.

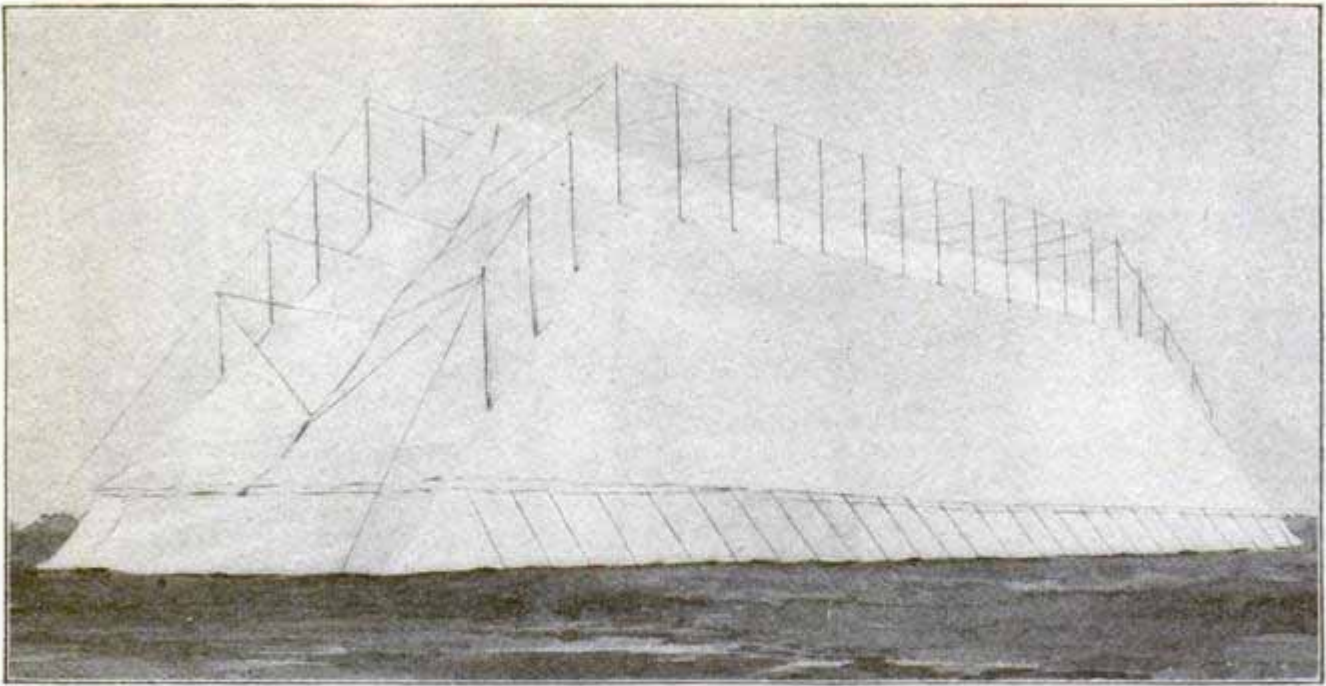
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### TO ENCOURAGE IRON INDUSTRY IN BRAZIL

Immense deposits of iron ore exist in Brazil, and to stimulate the industrial development of this valuable national resource President Pecanha has asked from his congress the authority to give a company or companies formed for the purpose such government aid as might be necessary. General F. de Sousa Aguiar, just retiring from the office of prefect of the federal district, has been appointed as a commissioner to go abroad for the purpose of securing the capital desired.

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Six hundred Chicago industrial workers met violent death while at their tasks during the past year.



Military Shed for Dirigibles

### PORTABLE AIRSHIP SHED

One of the latest dirigible airship garages in Germany is a huge affair of canvas that can be quickly taken down, loaded on wagons, and transported to other localities. At present it is erected on one of the military fields near Berlin; it is designed especially for military use in times of war. Its supports are two parallel lines of poles, not unlike those used to erect large circus tents.

### ARMY WIRELESS IN ALASKA

The U. S. army wireless telegraph system in Alaska, is, on the whole, one of the most perfect installations in any part of the world, regardless of mountain ranges and climatic conditions. Reports are continually received of extraordinarily clear service, the last of these coming from Nome. On the night of Sept. 23 the station at that point worked well both ways with the steamer "Minnesota" en route to Japan, at that time about 200 miles south of Mimak Pass and 1,300 miles distant.

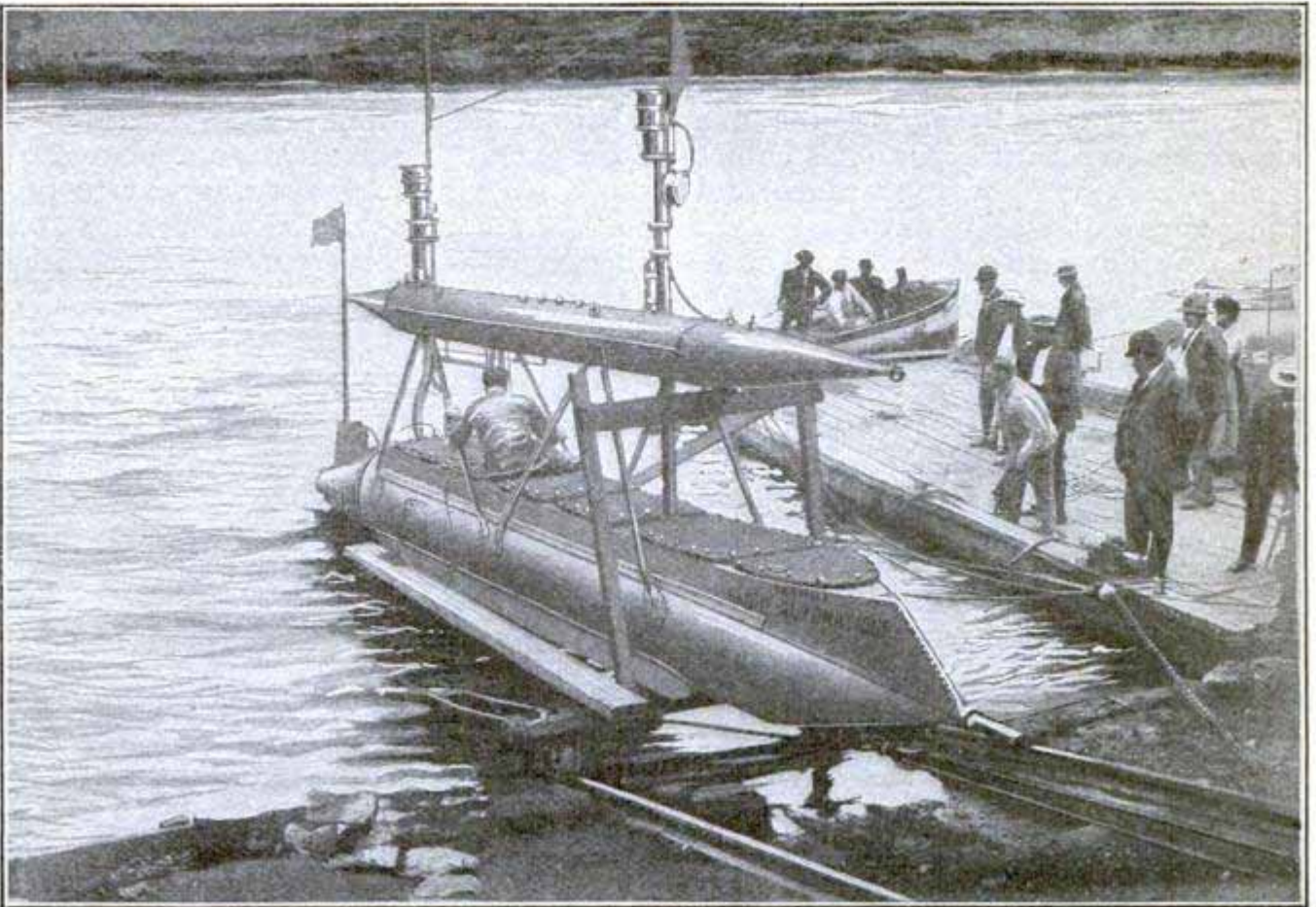
### HUDSON-FULTON WARSHIPS ACCLAIM NEW PRINCE

When official news that Cecilie, Crown Princess of Germany, had given birth to a son reached the flagship of the German fleet at the Hudson-Fulton celebration the tidings were signaled to all other warships in the Hudson river. Immediately a cannonading such as never had been heard there before broke forth. Each ship fired a royal salute of 21 guns, and all of the vessels dressed in gay colors in celebration of the event. Admirals and other officers in gold braid and medals visited the German flagship, where they extended congratulations to the commander, who cabled them to Berlin.

### DIRECTING TORPEDO BY WIRELESS

The wireless torpedo, or so-called torpedo boat, of M. Gabet, the French inventor, and his method of directing it in trial experiments, is clearly shown in these illustrations. The first illustration shows the death-dealing apparatus being launched, and the second is the motorboat by which the inventor directs its course. In the bow of the motorboat is the apparatus by which he sends the Hertzian waves, which are caught by the antennae rising from the upper deck of the torpedo and conveyed to the mechanism controlled by them.



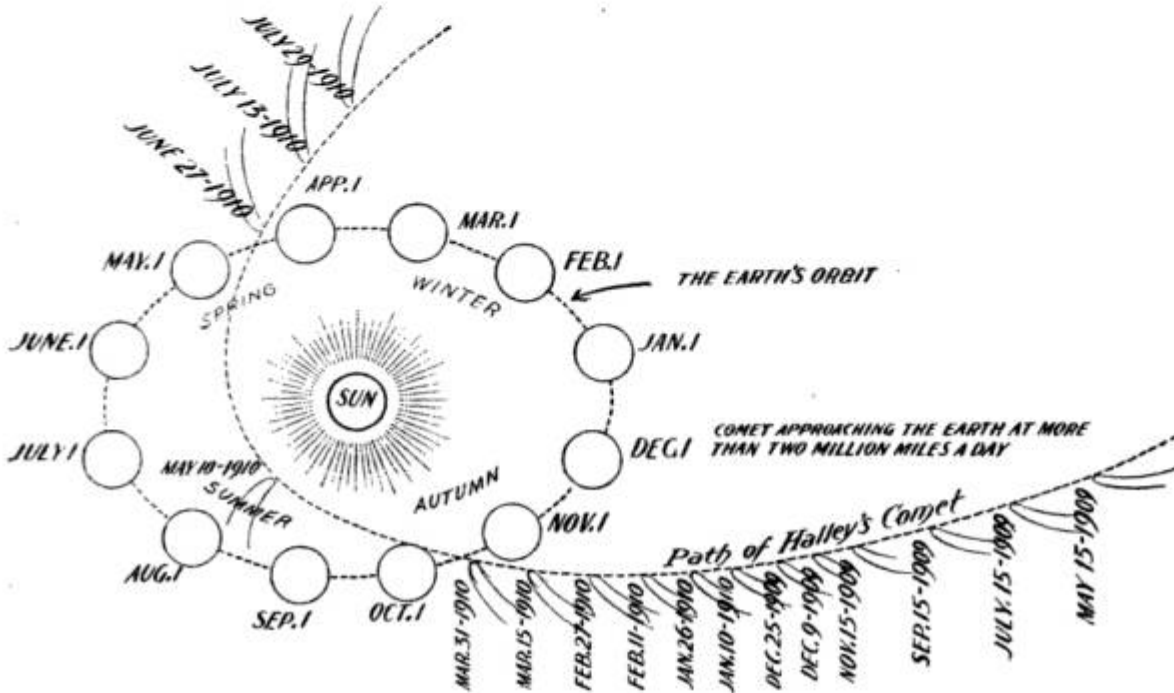


The Wireless Torpedo—Boat That Controls It from a Distance

## THE COURSE OF HALLEY'S COMET

Scientists and astronomers all over the world watched eagerly for the long expected return of Halley's comet after its 75 years of disappearance, and were rewarded by catching first sight of it in September. It will not, how-

be noted that the points in the diagram where it enters and leaves the earth's orbit are not its nearest approaches to the earth, although they appear to be so. The comet's position on May 10, shown in the diagram, is the point



Courtesy London Illus. News from Sketch by W. F. Denning, F. R. A. S.

Diagram Showing Course of Comet

ever, be visible to the naked eye until sometime next spring, the period of its greatest brilliance occurring in May.

This comet, which is the most famous in history, first appeared in 1682 and was given the name of Halley because of that astronomer's profound investigation of it. He fixed its period of revolution around the sun at about 75 years, and predicted that it would appear again in the early part of 1759. He did not live to see his prophecy fulfilled, but it duly returned—the first body of the kind to verify such a prediction—and was detected on Christmas day, 1758. It appeared again in 1835, passing within 5,000,000 miles of the earth, comparatively close. Then according to all calculations it was to appear again to the naked eye in the spring of 1910, this prediction now again being fulfilled.

The illustration gives the relative course of the comet and the earth from May 15, 1909, to July 29, 1910. It should

where it is nearest the earth. The distance given is 10,000,000 miles, which, if the prediction is correct, will mean that it will not approach within 5,000,000 miles as close this visit as on the visit of 1835.

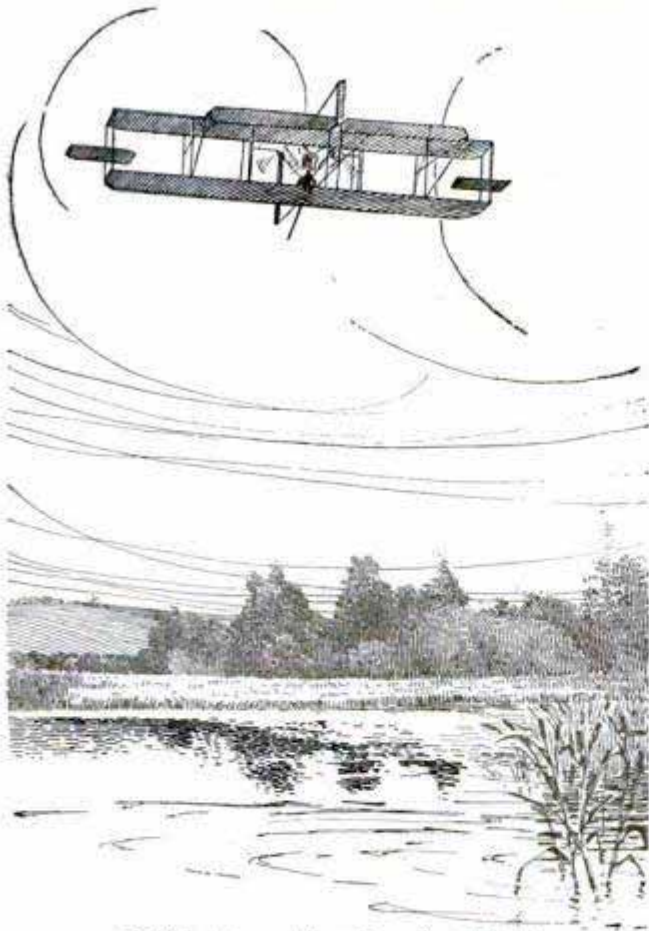
A comet, according to Cecil G. Dolmage, LL. D., F. R. A. S., is, briefly, an illuminated filmy-looking object, made up usually of three proportions—a head, a nucleus, or brighter central portion within this head, and a tail. It comes up into view out of the immensities beyond, moves toward the sun at a rapidly increasing speed, and, having gone around it, dashes away again into the depths of space.

The spectroscope shows the presence of hydrocarbon compounds, and at times, also of sodium and iron, in comets. Some of the light which comes from them, however, is merely deflected sunlight. The fact that the tails of comets are always directed away from the sun, has given rise to

the idea that this is caused by some repelling action emanating from the sun itself, which is continually driving off the smallest particles. Two leading theories have been formulated to account for the tails themselves upon this assumption. One of these, first suggested by Olbers in 1812, and since then carefully worked out by Bredikhine, presumes an electrical action emanating from the sun; the other, that of Arrhenius, supposes a pressure exerted by the solar light in its radiation outwards into space.

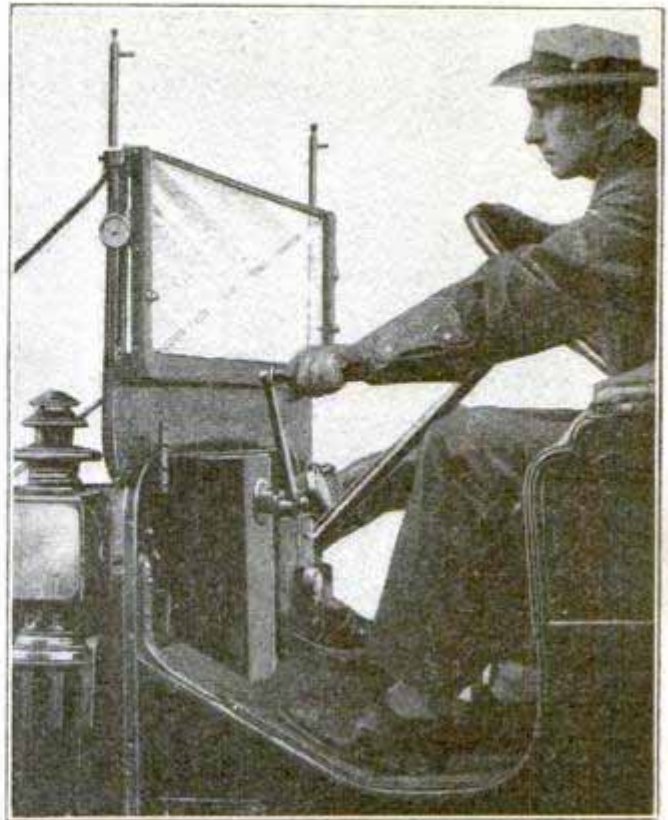
### ENGLAND'S FIRST SUCCESSFUL AEROPLANE

England, through the work of Col. Cody, an American holding a commission in the British army, can now feel that she is not altogether behind in the science of heavier-than-air aerial flight. Cody recently flew 8 miles in  $9\frac{1}{4}$  minutes in his new army aeroplane.



British Army Aeroplane in Flight

The means of maintaining a balance on this machine is very much like that adopted by Curtiss.



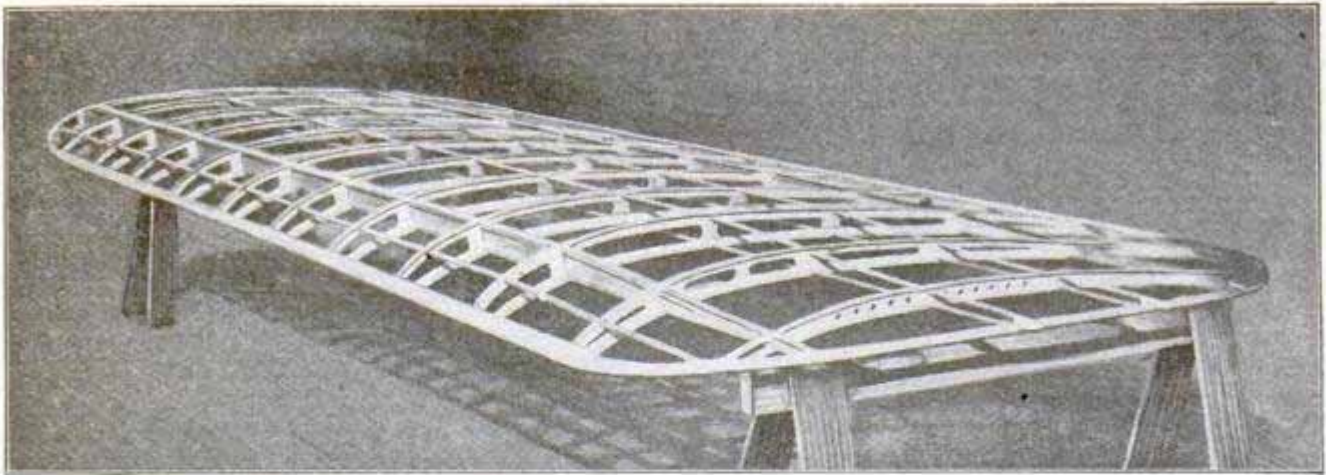
How the Cranking Device Works

### CRANKING AUTOS FROM DRIVING SEAT

The cranking arrangement in this illustration overcomes the necessity of stepping from the automobile to start the engine. It consists of a countershaft running above the motor, connected at the front end to the crankshaft by means of a sprocket, chain and ratchet device, and at the rear end to a crank mounted on the dash. This crank is shown in the accompanying illustration.

The ratchet on the crankshaft disconnects the countershaft and gearing as soon as the engine starts. A considerable gear reduction in the sprockets makes the crank easy to turn. The same kind of device is used on motorboats in which the engine is installed under a hood in the bow.

Heavy rains averted the threatened destruction of jack pine timber in one of the wooded sections of the country by literally washing the worms from the infested trees and drowning them in the flooded ground.



Stripped Wing of Bleriot Aeroplane

### FIRST "BLERIOT" IN AMERICA

The first Bleriot monoplane of some fifteen or more contracted for by American enthusiasts of aerial sport arrived in New York in October, but demonstrations of the type of machine that flew across the English channel were delayed for some time because the wings, or main supporting surfaces arrived in an uncovered state.

This fact, however, gave an excellent opportunity for the photograph here shown, which gives a clear idea of the construction of the framework. The size of the wing, of which there are two to the complete machine, is a little more than 13 ft. long by  $7\frac{1}{4}$  ft. wide. It weighs about 17 lb. bare, and 22 lb. with covering, and its material is

mainly white pine, hollowed and lightened, with a back supporting edge of aluminum. Baldwin rubber-silk balloon material was used as a covering.

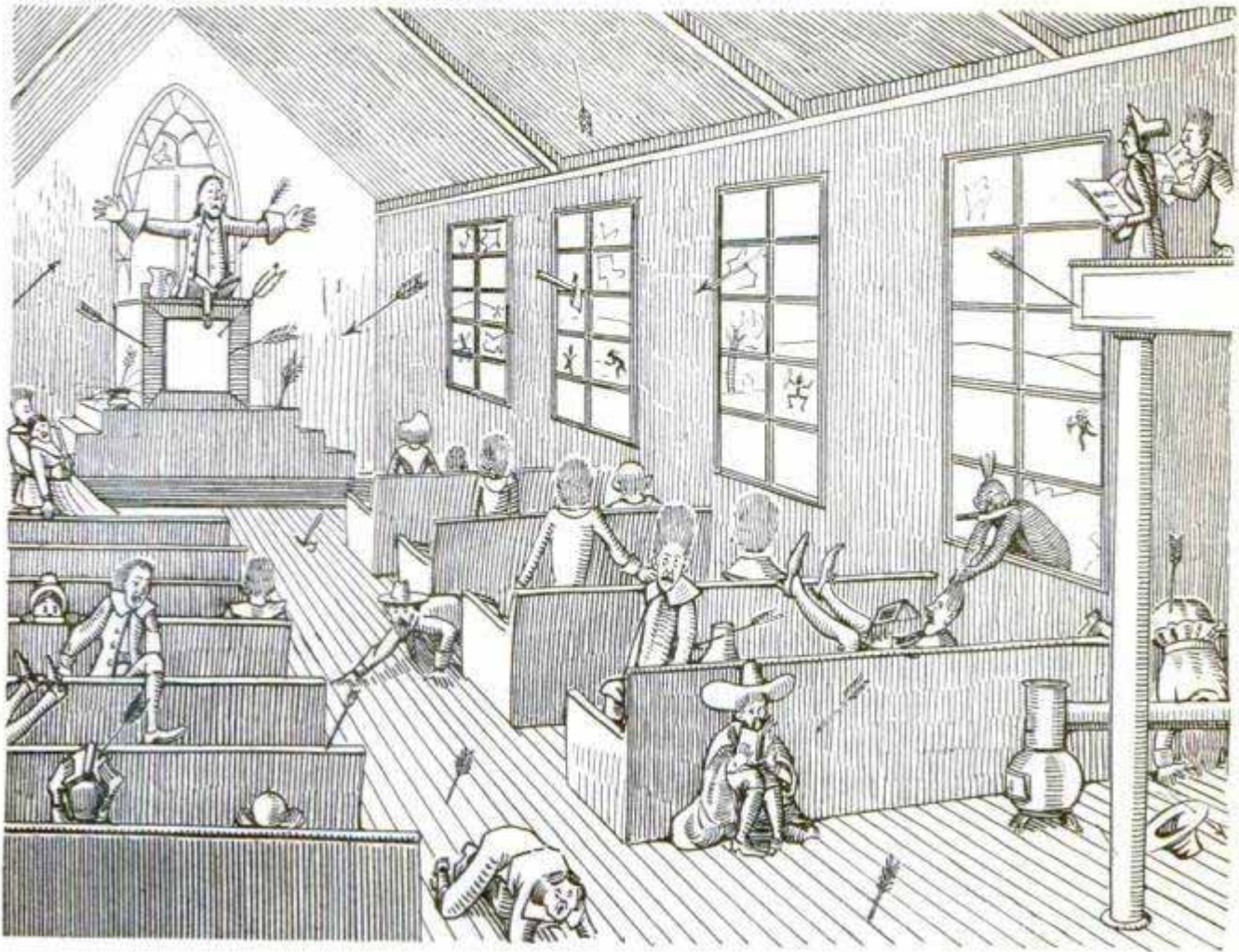
An interesting feature of the importation of the machine was that it passed through the customs under bond, as no tariff laws have yet been made to cover it.

### FASTEST VESSEL IN U. S. NAVY

The U. S. S. "Reid," one of the new class of torpedo-boat destroyers, has won the title of the fastest vessel in the American navy and one of the fastest in the world. In her trials she made a speed of but a fraction less than 40 miles an hour, developing a shaft horsepower of 15,000.



American Torpedo-Boat Destroyer Makes 40 Miles an Hour



The Thanksgiving of Our Forefathers

### ONE MAN POISONS NEARLY 600,000 PRAIRIE DOGS

For several years past the United States government has been waging a bitter war of extermination against the prairie dogs that infest parts of the southwestern states in such numbers as to prove a menace to crops, and within a period of eight months one man has killed nearly 600,000 of them. This man is J. W. Holman, recognized as the government's official prairie dog poisoner. He is paid  $1\frac{1}{4}$  cents per head, which means that during the eight months in question he made over \$7,000, besides having strychnine provided him by the government.

### LARGEST GRAPE BASKET EVER MADE

The grape basket shown in this illustration is claimed to be the largest ever made in any part of the world. It

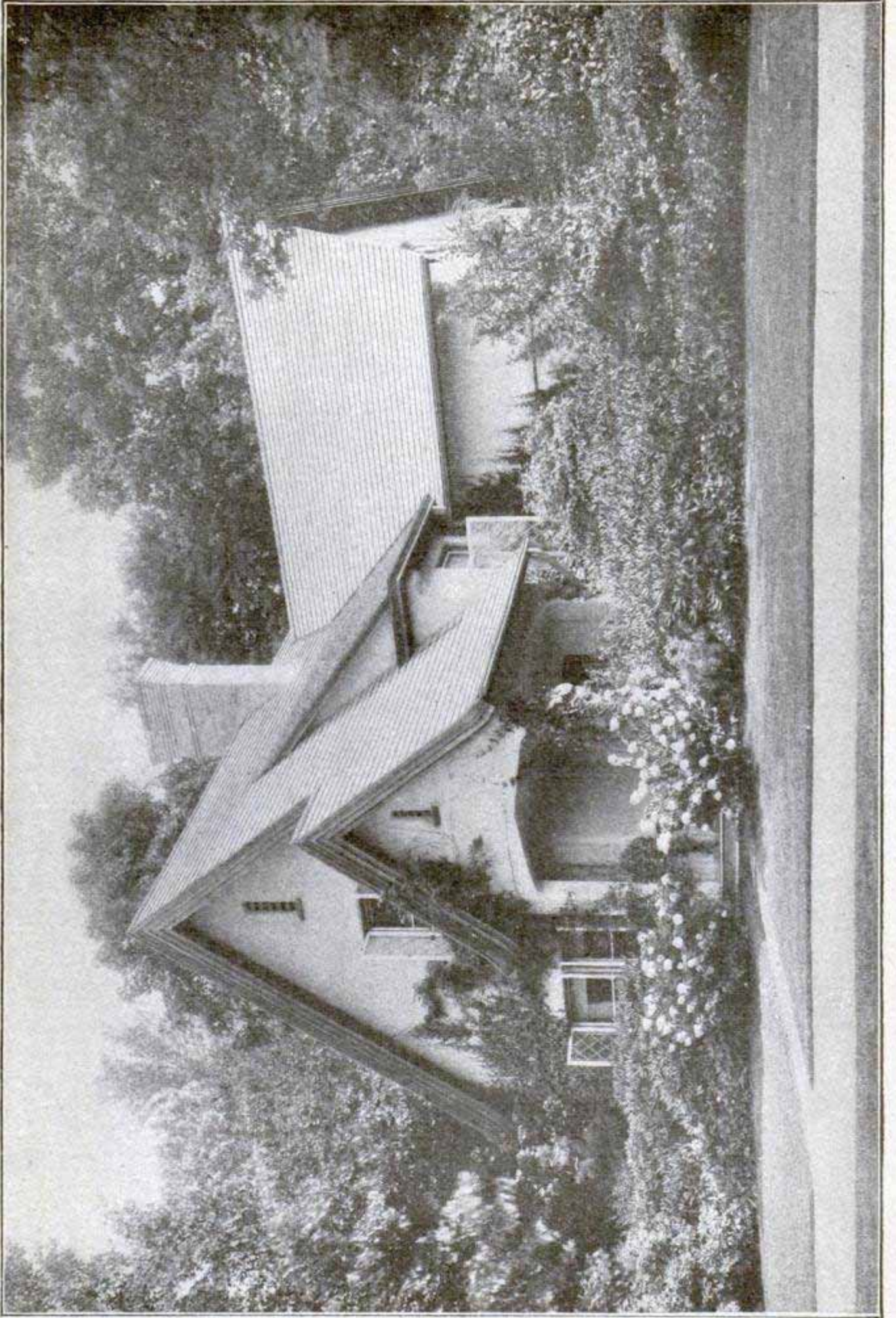
composed the float which won first prize at the "old home week" celebra-



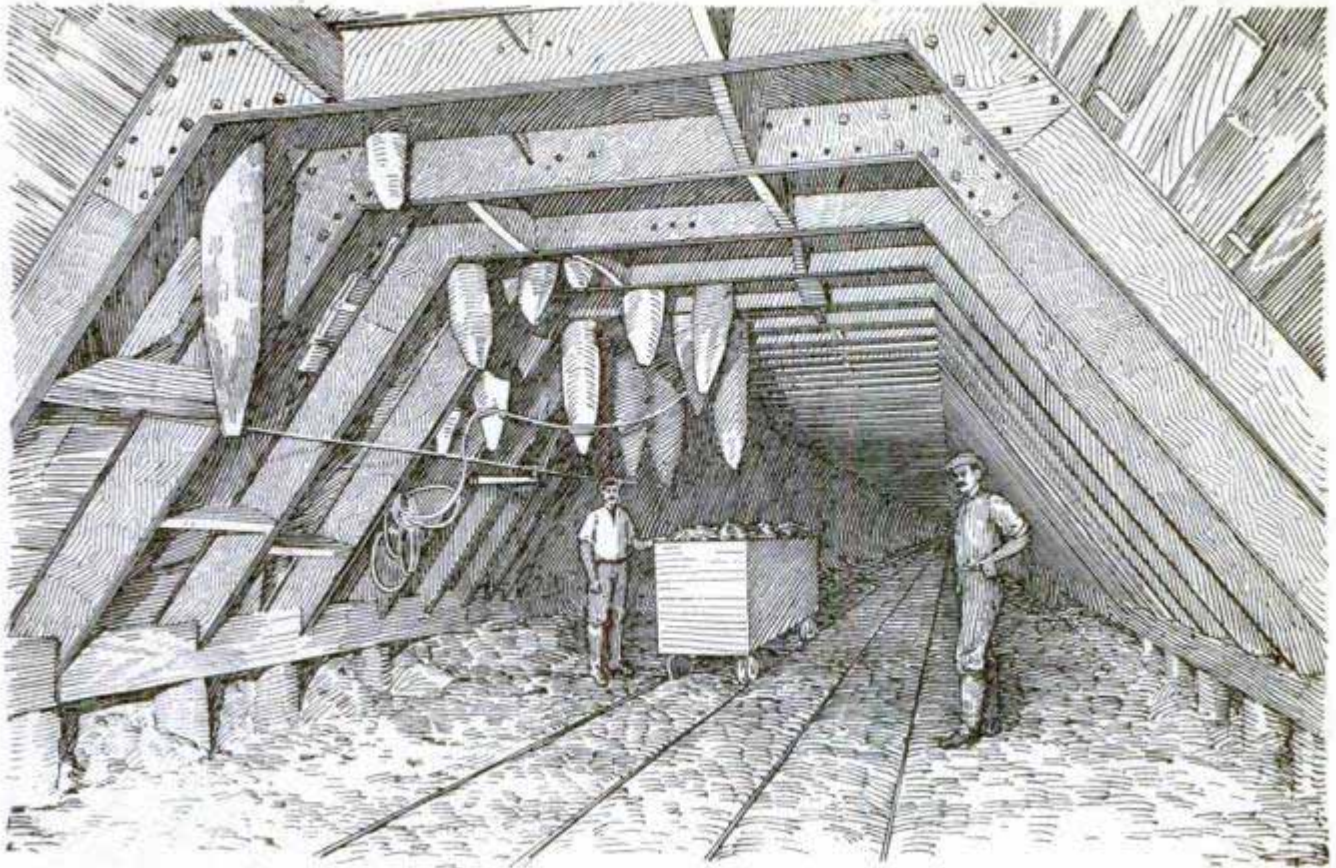
Unique Grape Basket Float

tion of Westfield, N. Y. In size it is 16 ft. 6 in. long, 6 ft. 6 in. wide, and 4 ft. 3 in. deep.

During the last fiscal year 3,117,301,535 fishes and fish eggs were distributed by the bureau of fisheries.



ARTISTIC CONCRETE BUILDINGS—No. 2, Gardener's Cottage, Hugh Hill Estate, Irvington on Hudson



Old Piles Protruding Through Tunnel Framework

### OLD PILES ENCOUNTERED IN HUDSON TUNNEL WORK

The task of constructing the Hudson and Manhattan tunnel system involved almost every possible combination of underground construction conditions. Comparatively little of the work, owing to the geological conditions, was in solid rock formation, a great portion being in soft ground.

The illustration shows the method adopted in this soft ground work in a stretch where old piles were encountered. The steel framework used to keep the overhead soil from caving in while the work progressed was put in place with the ends of the piles protruding.

Telephone dispatching systems have been installed on 18 divisions of the Santa Fe, the longest division being between Chicago and Newton, Kan., a distance of 656 miles.

The common brick product for 1908 was valued at \$44,765,614, a decrease of \$14,019,847 from that of 1907.

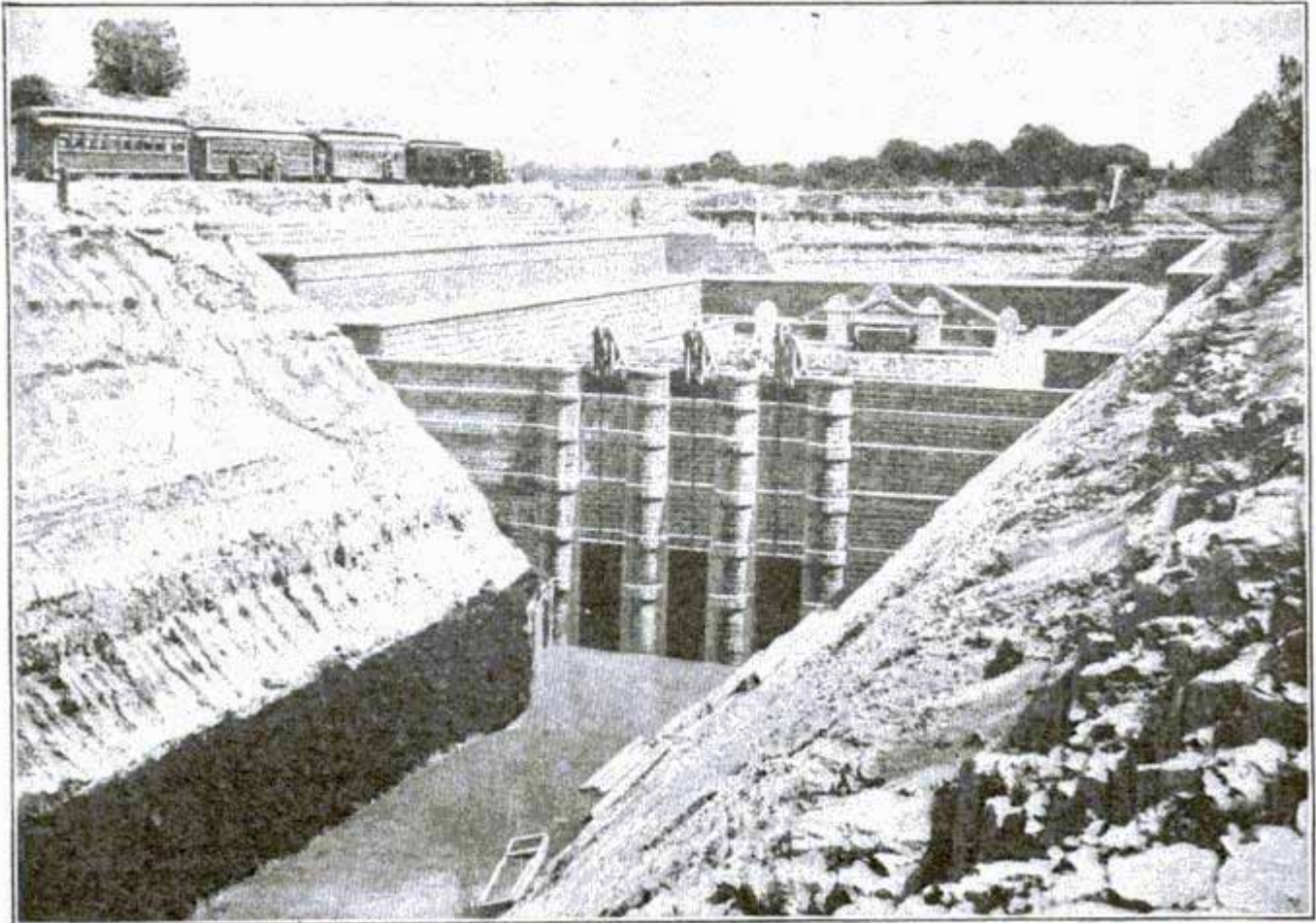
### MEETING THE AUTOIST HALF WAY

There is a growing spirit in many of the smaller cities and towns of the country to meet the autoist half way if he is willing to do likewise. This sign



A New Sign of the Times

at Lebanon advertises such a spirit in that community, with the hint to drive slowly.



Drainage Locks in Mexico

### LOCK WHICH DRAINS MEXICO VALLEY

The lock shown in this illustration is the final completion of a system for the drainage of the City of Mexico and the Valley of the same name started by a French engineer in 1866. Its work began with the cutting of a tunnel, but the work ceased on the downfall of Emperor Maximilian. It was resumed again in 1885, more interruptions occurred, and its final completion is just recent.

The drainage canal is 23 miles long, 20 ft. wide, and 30 to 70 ft. in depth. It serves to drain the waters of the lakes of Texcoco, Chalco, Xochimilco, and all the running water that passes through the valley on its way towards the Gulf of Mexico.

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When the U. S. S. "South Dakota" was drydocked at Mare Island recently 600 tons of barnacles were scraped from its bottom.

### GOLD MIRRORS FOR AUTO HEADLIGHTS

Tests which should be of great interest to everyone owning or contemplating the purchase of automobiles have been made by the Royal Automobile Club of England, to find a substitute for the silver mirrors of headlights.

The most important objection to the silvered mirror is the fact that in powerful headlights it makes a white, blinding glare that dazzles the drivers of approaching vehicles, often causing serious accidents.

On the other hand, mirrors coated with gold instead of silver throw a beam of light practically devoid of the blue and violet rays of the spectrum, being composed of red, yellow, and green rays only. At the same time the range or penetrative power is claimed not to be reduced, and, by the elimination of the violet rays, the dazzling effect is reduced.

It has always been taken for granted, according to an English magazine in-



terested in the subject, that the whiter and more powerful the light, the more perfect the illumination, but this is by no means the case. The red and yellow rays are far less absorbed by the atmosphere than the violet rays, which is well borne out by the penetrative power of gas and the electric arc in a fog, the latter being visible a shorter distance than the former.

### WRECK OF NEW ORLEANS HORTICULTURAL HALL

Of the million dollar damage accomplished in New Orleans by the severe wind storm of September the horticultural hall, half of which was demolished, presents an item of \$60,000. This building, the wrecked portion of which is shown in the illustration, was the only remaining structure of the World's Industrial and Centennial exposition of 1885. It was 600 ft. long

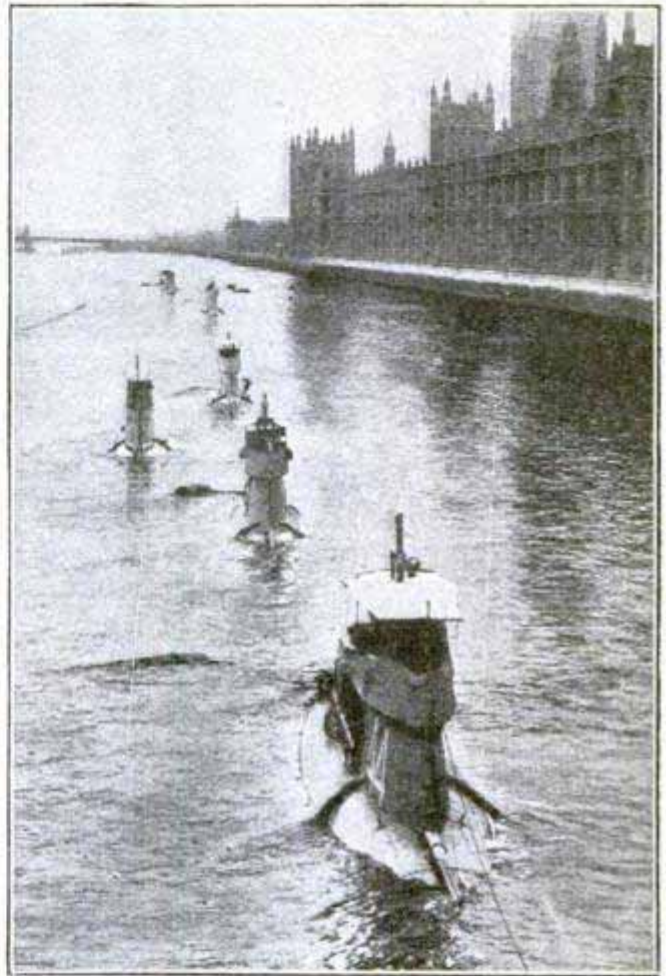


Result of Wind in New Orleans

by 194 ft. wide, and at the time of its wrecking contained fine specimens of plants from all over the world.

### SUBMARINES IN THE HEART OF LONDON

Among the many curious and interesting sights the people of London were



Interesting Feature of Naval Display

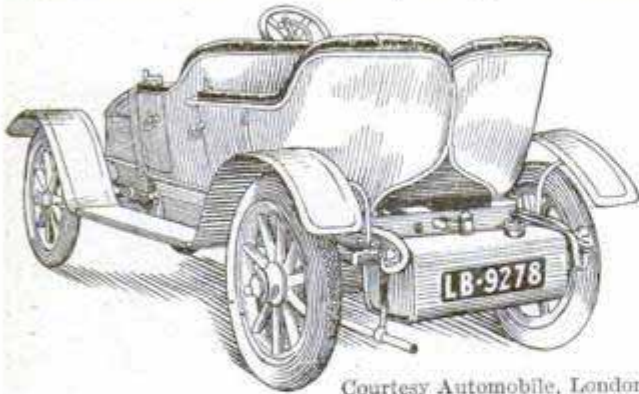
treated to during the great naval display, none offered a greater contrast than did these wicked little submarine fighters, sulking half in and half out of the water of the Thames just abreast of historic Westminster.

### FORBES BREAKS BALLOON RECORD

A. Holland Forbes, who left St. Louis in a balloon on the morning of Oct. 12, landed 19 hours later near Richmond, Va., a distance of 731 $\frac{1}{4}$  miles. The exact time of the flight was 19 hours and 15 minutes, at an average speed of close to 38 miles an hour. The flight broke all speed records for long-distance flights, and won for him the coveted Lahm cup.

## LATEST DUSTLESS AUTOMOBILE BODY

The efforts of European automobile manufacturers for the past year have



Courtesy Automobile, London

Obviates the Vacuum Behind Automobiles

been directed towards the designing of an automobile body that will not raise the dust. Many different variations of bodies have been tried out in the experiments, but all are of the new torpedo-type, which seems to be the most effective. This car has the torpedo shape, and in addition an altogether new feature. It is a clear opening from the underpart of the body, through which the air sweeps freely. The rear panels are also curved around in a peculiar fashion, and the two features do away with the dust-raising vacuum which usually exists behind the rear seats.

## EXPLOSIVES FOUND IN BUNKERS OF BRITISH WARSHIPS

Although attempts have been made to hush the matter up it has become known that repeated discoveries have been made of explosives in the bunker coal of British war vessels. On August 13 explosives were found in the bunkers of the "Lord Nelson" and "Victorious," followed on Aug. 18 by a similar discovery in the bunkers of the "Duke of Edinburgh." The last discovery was a detonator in the bunkers of the scout "Forward," attached to the second destroyer flotilla of the home fleet.

Attempts were made to minimize the danger, but at the same time war vessels were ordered to unship their bunkers for examination, and all bunk-

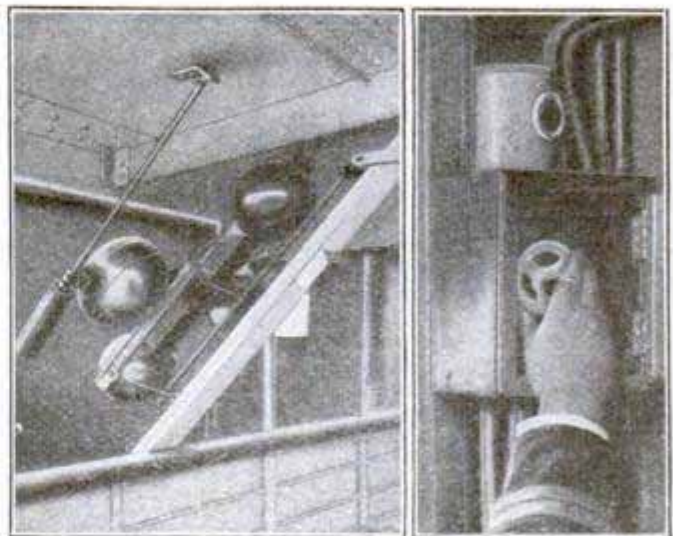
ers shipped now are being closely examined.

## FLYING-MACHINES TO WIN WARS

Hiram Maxim, famous inventor of explosives and engines of war, predicted at a recent banquet that, hereafter, wars will be won by the side with the strongest flying-machines and the most of them. He added, however, that their use would be as scouts, and as destroyers of bridges, magazines, and warehouses, insisting that such machines will never be able to work wide destruction by dropping explosives from the air.

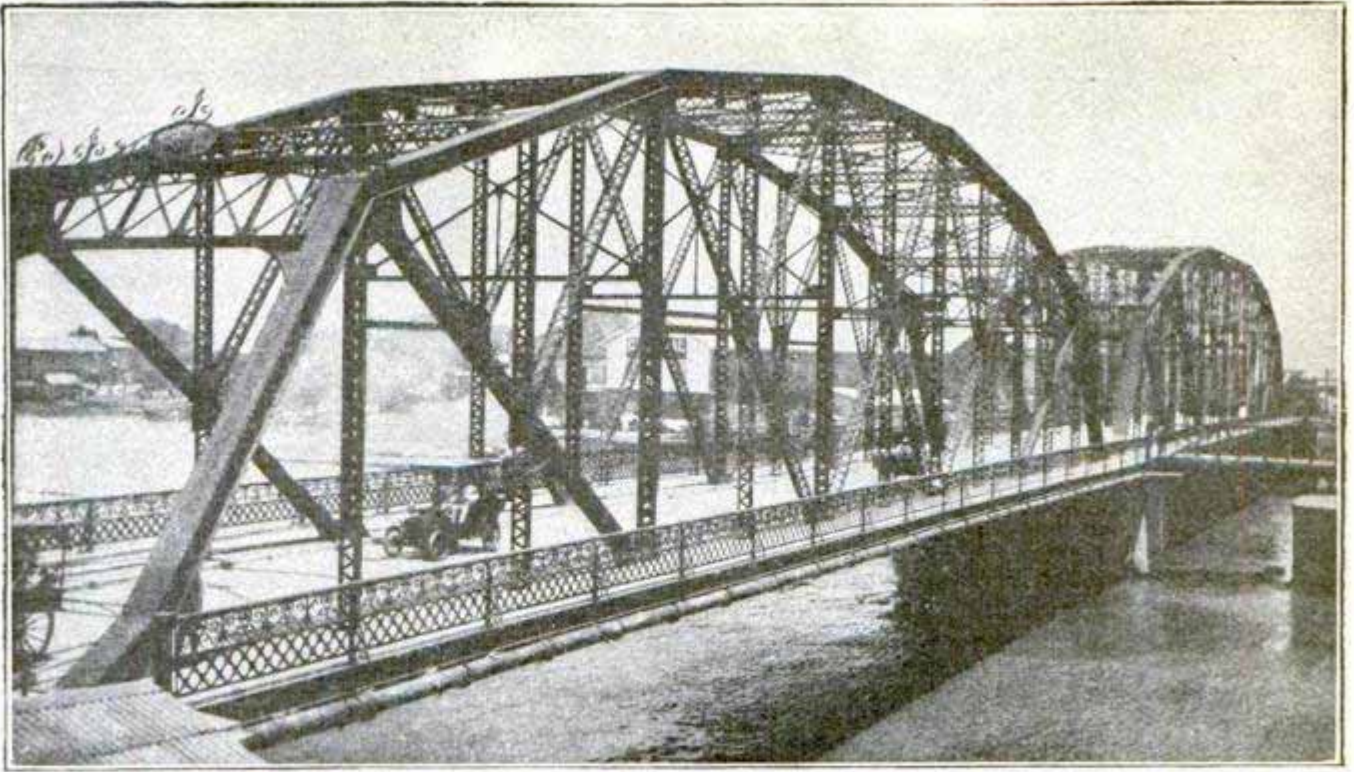
## AUTOMATIC LIFE BUOYS

Nearly all the great trans-Atlantic liners are equipped with a number of these automatic buoys, so arranged about the open spaces of a ship that they are simultaneously thrown into the water by the simple turning of a valve on the bridge. Should a person fall overboard, the alarm is no sooner given than these buoys are dropped. The rod shown attached to one of the air-tanks of a buoy contains acetylene, and the moment it strikes the water sticks upright and flares, thus guiding the person who has fallen overboard. The second illustration shows the valve



One of the Buoys on Its Chute—Turning the Valve that Sends Them All Overboard

by which five or six of the buoys are simultaneously dropped overboard.



The Ayala Bridge, Spanning the Pasig, American-Built—The San Miguel V-Shaped Bridge, Built by Spain

## MANILA A CITY OF BRIDGES

An Australian who recently visited Manila referred to it as a city of bridges. He was more or less correct, for the city is now graced by many great steel structures spanning the Pasig, the Mississippi of the Philippines, and its numerous canals and creeks. One illustration shows the old suspension bridge, built by the Spaniards, and which is now condemned except for pedestrian traffic. This bridge is built of plank and rope, and sways and creaks from the weight

of a single person walking rapidly over it.

Another picture shows what was formerly known as the "V"-shaped or crooked bridge, also built by the Spaniards. The reason for its peculiar construction was to gain a foundation in the center of the Pasig on a small island. At the apex of the angle it has a small runway leading off to the island, upon which the Catholic sisters maintain an asylum for the feeble minded. This bridge was recently re-

placed by the handsome structure shown in the first picture, known as the Ayala bridge, which was built by



Old Spanish Suspension Bridge

an American organization. At the further end of the suspension bridge is shown the rear of the government's million-dollar ice and cold storage plant, the largest in the world.—Contributed by Monroe Woolley, Fort Casey, Wash.

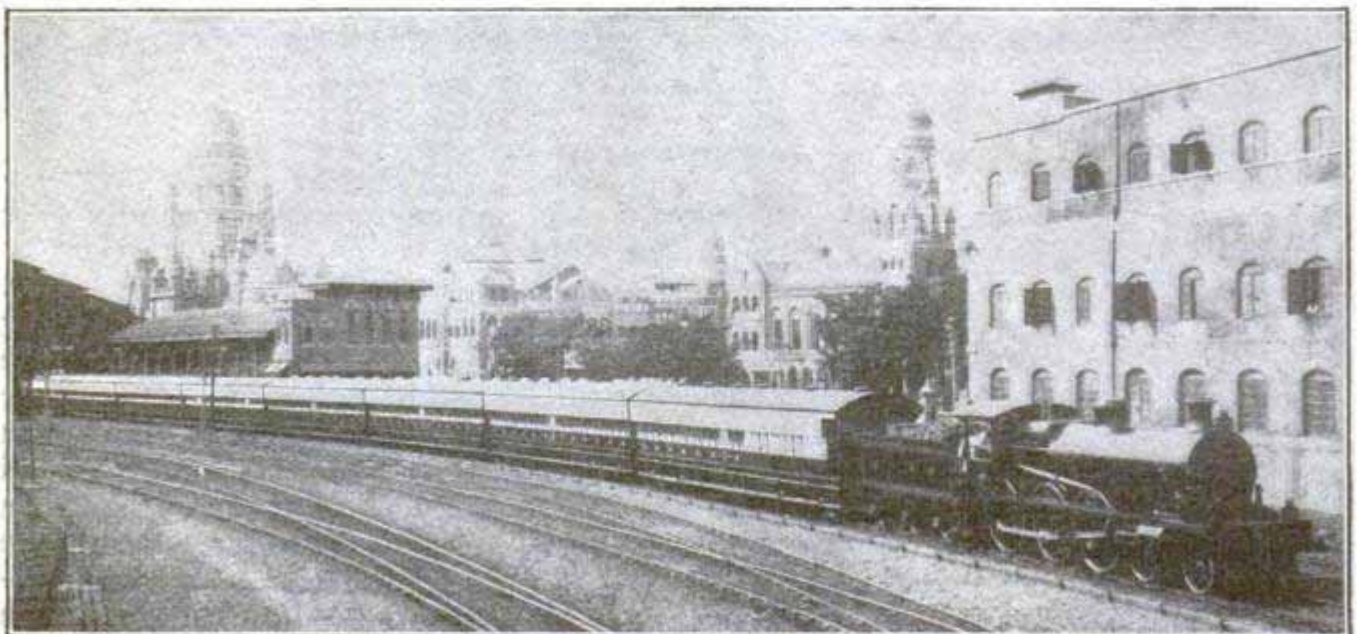
## DEVELOPMENT IN AERIAL TORPEDOES

**The Latest Horror of Modern Warfare  
Is Being Rushed by Armies  
of the World**

Aerial torpedoes are the latest horror that is about to be added to modern warfare. There have been submarine mines and submarine torpedoes, smokeless powder and noiseless guns and airships, but the idea of carrying 150 lb. of gun cotton 10 miles and dropping it on the head of an ordinarily inoffensive citizen looks like crowding the limit on modern destructiveness. This, however, is being worked out in Washington, and Emil Berliner, known in fame in other and more peaceful directions as an inventor, is the man who is developing the idea.

The aerial torpedo is already invented, and it will take another Hague conference to prevent its use should occasion demand. It is nothing more nor less than a small aeroplane carrying a torpedo in place of an operator and provided with an automatic balance and steering device to the same end as a submarine torpedo.

The thing about the device that has given more trouble than anything else is getting a simple and light-weight motor. This problem is now solved and there is a motor in the Berliner



Transcontinental Express Leaving Bombay, India

shops that will develop 12 hp. on the brake and weighs only 50 lb. The motor is very simple in construction. This first working model was not built for light weight, especially, and it is said that it can be cut down 12 lb. without interfering with its efficiency when the next motor is built. The saving in weight will be due chiefly to the use of vanadium steel in the cylinders. This was not available when the first motor was constructed, but cylinders of this material have been ordered and will be ready for installation in the next motor.

The motor is something of the Adams-Farwell type, with revolving cylinders. These act as a gyroscope to keep the aeroplane steady in the air and make the motor run without the vibration that would shake a small aeroplane to pieces with a motor of the same size and weight of a reciprocating type. The motor on a light wooden base has been run without any trouble from vibration and it was standing still in the sun for half an hour without over-heating. It is true that standing still on a long run the cylinders get a little too hot for greatest efficiency, but moving through the air will keep them just right. One of the cylinders has been fitted with a copper jacket, with cooling flanges, and this aids the cooling without appreciably increasing the head resistance, but it is not thought that in practice it will be necessary to use the jacket at all.

Mr. Berliner has tried out a lot of propellers and has found a pair of light weight and suitable efficiency. This and the motor constitute the chief problems, and, being satisfactorily settled, he is not bothering much about the aeroplane to carry them. The whole installation will be of such light weight that not much wing surface will be required. The machine will be a monoplane, and as it will make 50 miles an hour, there will probably be only about 100 sq. ft. of supporting surface. The automatic balance is worked out so that it is simply a question of putting the machine together.

The aeroplane will carry a gasoline

supply for a flight of half an hour, but it is not thought likely that it will ever be used at anything like that distance. It would hardly be possible to hit anything but a big city at that range. But the aerial torpedo will outrange the biggest gun now in use, and it is possible that it will be of use against attacking fleets and coast fortifications, and will be even more effective than the aeroplane itself in holding up rich cities for ransom.

It is pointed out that the aerial torpedo is much cheaper to construct than a submarine torpedo, and that it is more accurate at the same range than the submarine projectile.

The laboratory is well satisfied with the work it has done on the revolving cylinder engine, and is constructing another of 60 hp. for Mr. Berliner's helicopter, and this will be tried also on the helicopter of Newton Williams, who, it will be recollected, was lifted along with his machine at Mr. Berliner's country place last summer. In this trial the helicopter had on board the two 30-hp. revolving cylinder engines that had been brought for practice and from which the present light-weight motor was developed. The Williams machine was never built to stand as much as 60 hp., but it was the first time that it ever got into the air with an operator on board. It was noticed at the time that when the lift once began, the machine shot into the air, so that it was plain that less than 60 hp. would have made it fly after the start had been made.

The new engine that is being built will be of greater horsepower and less weight than the two motors previously used, and it is thought that there will be some interesting developments in this line before next spring.

The helicopter does not promise to develop as much speed as Mr. Berliner originally predicted for it, but it seems to be particularly valuable for hovering and for observations. It will probably not make more than 15 or 25 miles an hour, but can stay still on the air or rise from a confined space and from any sort of ground.

### AEROPLANES DIFFICULT TO SEE

One important question determined by the aviation meeting at Rheims was to what extent an aeroplane would offer a mark to gunners in times of war. The course was but three miles long and level, but even with powerful field glasses it was difficult to see the aeroplanes when rounding the further end, they being completely lost sight of for many moments. Of course, they were against a dark background and would be far more easily seen if higher up, but nevertheless the difficulty of hitting them would be extreme.

### A WARSHIP FOR THE ASKING

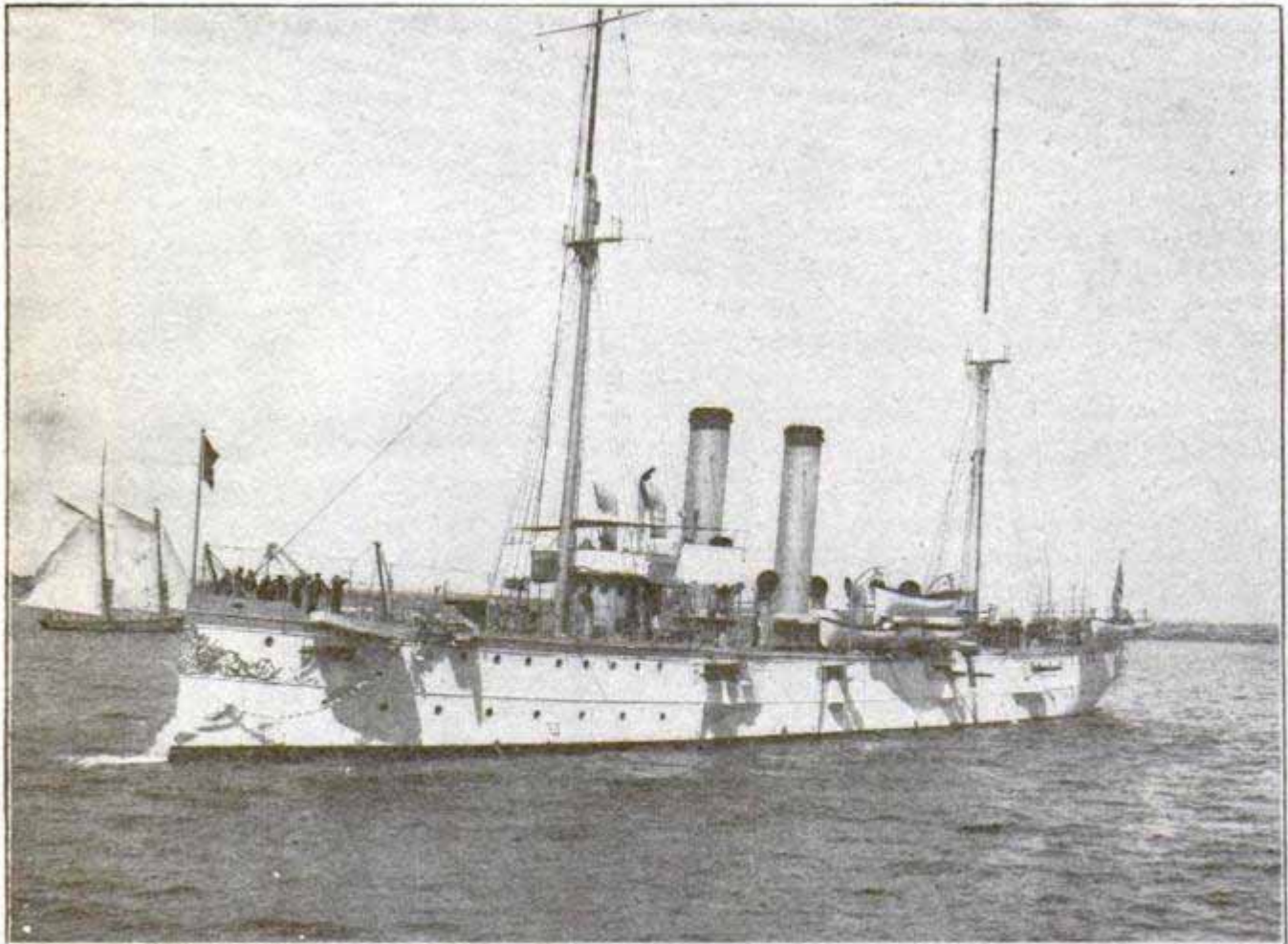
The little cruiser "Detroit," built 16 years ago, and one of the first to make a capture in the Spanish-American war, lay at the Charleston navy

yard all last summer waiting to be given away to some state that desired her for its naval or military forces.

The "Detroit" has been at the Charleston navy yard for four years and looks very rusty, but has many years of service in her yet. It takes only a short time for a steel ship to become rusty if not continually cared for, and a new "Dreadnought" would look like a junk pile after four years of such treatment.

### CURE FOR SLEEPING SICKNESS

A French physician has announced to the French Academy of Sciences a cure for the sleeping sickness. It consists of a subcutaneous injection of an aniline emetic. The remedy was suggested by Dr. Evans, an American physician, and was worked out with reported remarkable results by Dr. Thiroux in Senegal, a French colony in Africa.



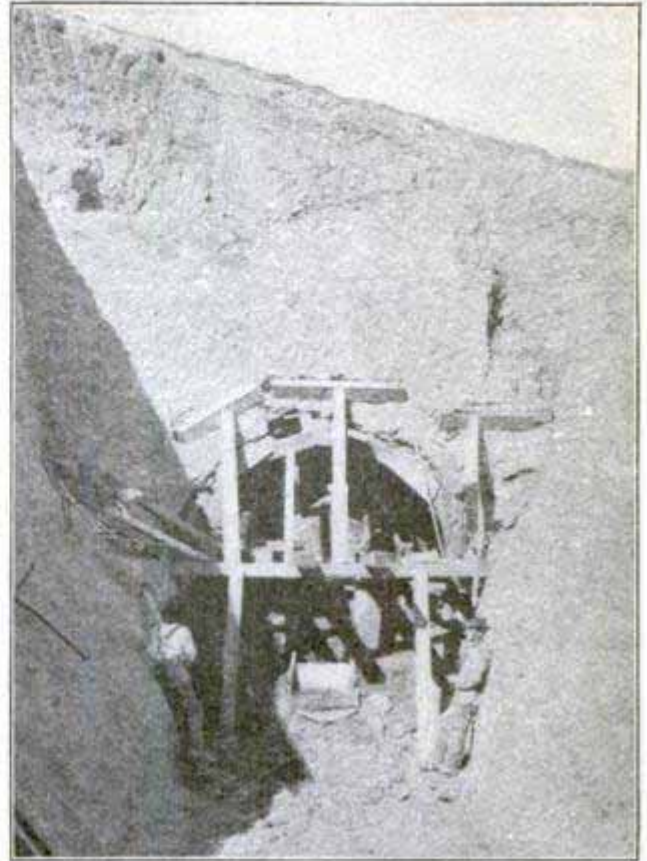
Waiting to be Given Away

## BREAKING THE WORLD'S TUNNEL RECORD

By Burt A. Heinly

What is claimed to be the world's record for tunnel boring through soft rock is the run of 1,061.6 ft. made on the Los Angeles aqueduct during the 31 days of August. The best previous world's record is that which was made during July on the Loetschberg tunnel (Switzerland) with a run of 1,013 ft. This, until the aqueduct footage was announced, was recognized as the world's best.

The aqueduct forces in this achievement worked in the soft sandstone of tunnel 17 M, which is 28 miles of Mojave and on the edge of the Mojave Desert. The tunnel forms a part of the 250-mile aqueduct which the City of Los Angeles is building from the foot of the High Sierra to the San Fernando valley. The achievement is the more remarkable when it is remembered that the men worked under conditions of excessive desert heat. The graveyard shift, that is, the force at work in the tunnel from 11 P. M. to 7 A. M., were required to get what rest was possible with the temperature a number of times registering 116 de-

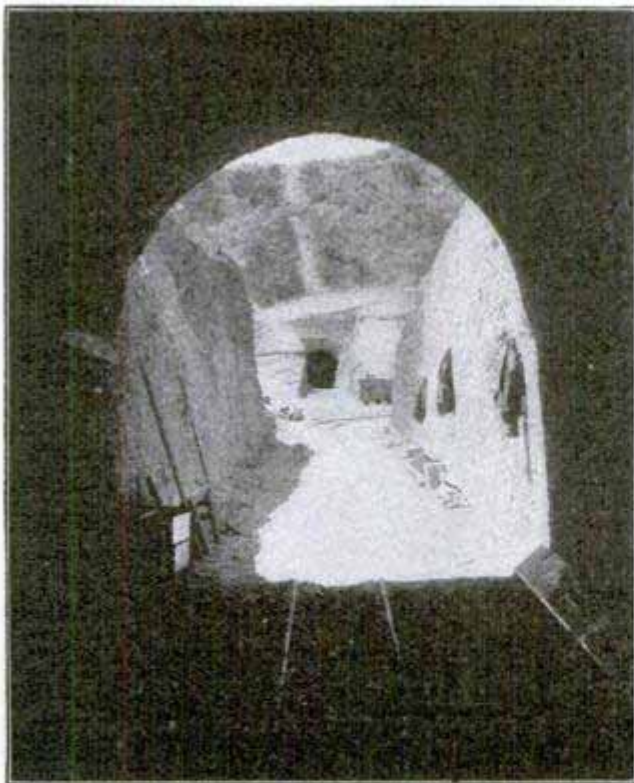


Portal of Tunnel 17 M at Time Work Was Started

grees in the shade and with the blinding rays of the desert sun making sleep almost impossible.

The distance of 1,061.6 ft. was accomplished by three shifts of men working 8 hours to a shift under the superintendency of Thomas Flanigan and with Benj. M. Pruitt as foreman. The men were employed a total of 728 hours, 16 hours out of the month being lost by reason of a cloudburst on August 29th, which flooded the entrance to the tunnel. The excavation has a maximum height of 11 ft. 8½ in. and a maximum breadth of 10 ft. 10 in., and when completed will have a length of 10,596 ft.

In July, two shifts of men drove the heading of this tunnel 576 ft. Mr. Flanigan, the latter part of that month, told Wm. Mulholland, the chief engineer, that his men were eager to try for the world's record during August and asked that the work be permitted to go on uninterruptedly night and day with three shifts. This request was granted



Looking from Tunnel 17 M in Which the Record Was Made

and at the stroke of midnight of July 31, the blow of jack on drill told that the race was on.

Along the entire line of the aqueduct where more than 100 tunnels are now undergoing completion, the progress has been watched with the keenest interest and daily reports concerning it were sent out.

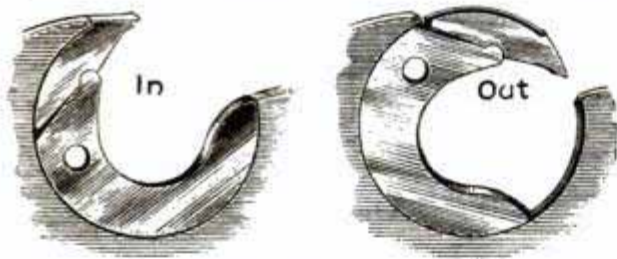
July 31, the distance into the heading was 964 ft. All of the work was done with hand augers, one shift of men relaying the other in drilling and blasting with little or no delay, excepting that of August 29th. The muck was loaded in ore cars and drawn by mules to the dump. The ventilation of the tunnel was accomplished by drilling holes through the roof, 75 ft. to the sur-

face. Very little timbering was required.

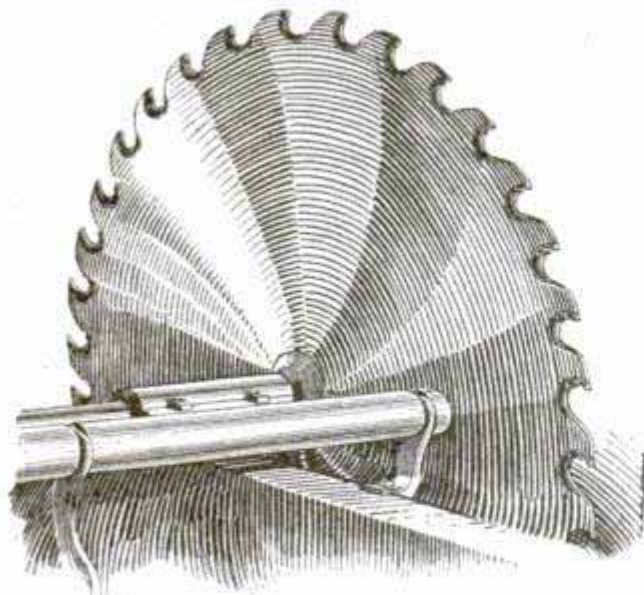
The City of Los Angeles pays its men on the bonus plan: that is, it is willing to divide the profits with the men where more than the average amount of work is done. The average footage which the average shift should accomplish in 8 hours in this tunnel was fixed at 4 ft. The phenomenal speed and ability of these men is shown from the fact that the average speed per shift was in reality 11.27 lineal feet in eight hours. As a result of this, each man engaged on the face will receive in addition to his regular wage a bonus for the month of approximately \$35. The cost data is not all in, but it will run under \$6.00 per foot.

## A HOUSEWRECKER'S SAW

A circular saw has been invented and put to use by a Boston firm of building wreckers that will cut through



Detachable Tooth



An Unusual Saw

nails and bolts as well as through wood, and is proving so satisfactory that its users are advertising the mak-

ing of new lumber from old. In the wrecking of old buildings much of the timber torn out has had to be sold simply as wreckage and often is practically valueless because nails, spikes, and bolts make the attempt to saw it up into regulation lengths and widths impracticable.

The saw which makes this possible is an ordinary circular saw fitted with specially constructed teeth, these being fitted to the inner part of its regular teeth. The teeth are about 1½ in. long, with a special groove on the outer part and a special catch groove inside, so as to fit onto the circular saw teeth. The cutting end is flat and sharp, and is claimed to cut through iron, whether it be nails, spikes, or bolts, as if it were wood. The breaking of one tooth, should this happen, only necessitates a minute's delay while another tooth is being put in its place.

Large timbers that formerly lay on the wreckers' hands are sawed neatly and quickly, and are made to look like new timbers.

The firm's advertisement in a local paper is interesting. It reads in part:

SECOND-HAND LUMBER made into new lumber, any dimension, by our patent saw-mill; we are the first firm to do this; as a result we can furnish you boards, plank, studding, sills, etc. from sound and seasoned lumber, either hard pine or spruce; no waste to the buyer.



# DENATURED ALCOHOL (INDUSTRIAL ALCOHOL)

By Dr. Harvey W. Wiley, Chief of Bureau of Chemistry, U. S. Department of Agriculture

## ARTICLE IV

### Denaturing and Uses

**Alcohol as a Beverage.** Alcohol (neutral or Cologne spirit, etc.) has no value as a beverage. It does not possess any taste or flavor which is associated with any natural drink. It does not smell, taste, nor look like whisky, brandy, or rum. It possesses the sweetish mild odor and taste belonging to alcohol, and is never used as a drink by anyone with a refined taste. It is used, however, in immense quantities to "stretch" beverages, so that by using very large quantities of dilute alcohol, some color and flavor and beading oil, one gallon of an old and fragrant beverage like whisky, brandy or rum, is extended to five or more gallons and still offered to the consumer under the name of the real beverage.

Alcohol is also used in compounding liqueurs, cordials, and mixed drinks of many names and kinds. To avoid frauds upon the revenue and to protect the consumer from deception, it is highly important that alcohol intended for industrial purposes be so treated that it can not be added to alcoholic beverages without making them impotent to every one except him who drinks alcohol solely for its intoxicating properties. The process of rendering alcohol unsuitable for drinking is called "denaturing," and consists essentially in adding to the alcohol a substance soluble therein and approximately of the same boiling point, of a bad taste and odor of an intensity which would prevent any one but a drunkard of the most hopeless type from using it as or in a beverage.

In order that by simple distillation the denaturing agent may not be separated, it is important that it possess to some extent the same degree of volatility as the alcohol itself. When

subjected to distillation the larger part of the denaturing agent should distil with the vapor of alcohol, so that the distillate is not fit for consumption. The agent must also be of a nature not easily separated from its alcohol solution by precipitation.

**Denaturing Substances.** A large number of bodies has been proposed for denaturing, varying both in suitability for general denaturing process and in the nature of the use to which the denatured alcohol is to be devoted. Among the bodies which have been used for this purpose, the following are the more important, viz., crude wood alcohol (methyl alcohol) benzin, pyridin, camphor, turpentine, colophonium, copal resin, Manila gum, acetic acid, acetic ether, ethyl ether, acetone, methyl acetate, methyl violet, methylene blue, anilin, eosin, fluorescein, naphthaline, phenylphtalein, carbolic acid, bone oil, and nicotine. This is only a partial list. Probably more than a hundred denaturing agents have been proposed and tried. There yet remains to be discovered a perfect denaturing agent, viz., one which would absolutely prevent the consumption of the alcohol containing it, and one which could not be removed by the ingenuity of man.

For general purposes, such as use for heating, lighting, driving engines, making varnishes, etc., the following general formula for denaturing alcohol is prescribed by the Bureau of Internal Revenue:

"To 100 parts by volume of alcohol not less than 90% strength (180 proof) add 10 parts of approved methyl (wood) alcohol and one half part of approved benzin; or add two parts of approved methyl alcohol and one half part of approved pyridin bases."

Such a product is regarded as completely denatured. The term "approved" is used because some forms of wood alcohol and some forms of benzin and pyridin are so highly purified as to be unsuitable for use. As

has been stated, alcohol thus treated is so nauseous to the taste and offensive to the nostrils as to be entirely ex-

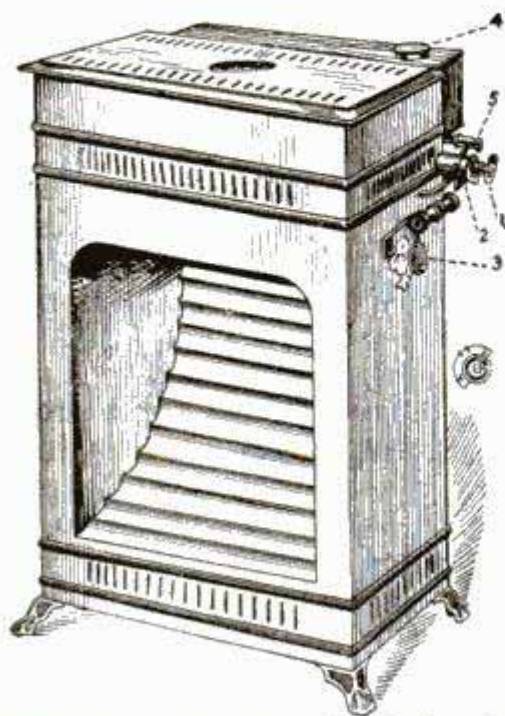


Fig. 18—Small Alcohol Stove for Heating Purposes

cluded from beverage uses except by the most depraved sot. Moreover, the denaturing agents are more or less poisonous and their ingestion would threaten health or even life. The crude wood alcohol, moreover, contains substances which exert a specific paralyzing influence on the optic nerve, producing impairment of vision or total and irremediable blindness.

Formulas for special methods of denaturing for special purposes are approved by the Bureau of Internal Revenue if they sufficiently guard against the possibility of using the denatured article as a beverage. For instance, ether may be used for treating alcohol intended for the manufacture of smokeless powder and nicotine is used in rum intended to be used in the manufacture of certain kinds of tobacco.

Upon the whole, it may be said that the regulations for denaturing alcohol are sufficiently elastic to cover all the exigencies of legitimate use.

**Heating and Lighting.** The most common and simple use of alcohol is for heating purposes. The chafing dish is a common illustration of this use. For many reasons alcohol is to be pre-

ferred to any of the products of petroleum. Chief among these is the fact that it burns with a smokeless flame. It is also less explosive than the lighter rock oils and has a more pleasant odor. Aside from its price, alcohol has many advantages over petroleum for heating purposes save in the number of heat units evolved in combustion. It is quite certain that were it not for the question of cost, it would speedily supplant other materials for minor domestic purposes.

Various devices have already been invented for the domestic utilization of alcohol for heating purposes. The alcohol stove is shown in Fig. 18. The numbers 1, 2, 3, 4, etc., refer to the various parts of the mechanism for starting the fire and vaporizing the alcohol before ignition. This is done automatically after the fire is once started. All successful heating apparatus include this device, since it is not practical to have the alcohol vaporized by means of a wick. In this particular apparatus, the heat is radiated by the corrugated and curved metallic back of the stove, the burners being at the top of the mechanism. The alcohol receptacle is seen at the back top part of the stove and the alcohol is poured in at the spot indicated by 4. On the

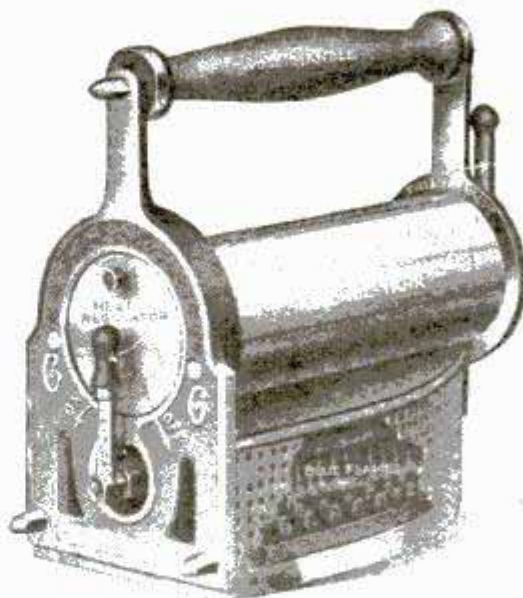


Fig. 19—Alcohol Flat Iron

side of the figure to the right marked AZ is a device attached to the mechanism for igniting in such a way that the

delivery of the liquid or gaseous alcohol in such a manner as to cause an explosion is rendered impossible.

A smoothing iron which is kept at a proper heat by a small alcohol stove within is shown in Fig. 19. Such a device would be of great service in doing the ironing at home, and avoid the scorching so commonly produced by taking the iron directly from the fire.

A simple device for popping corn or roasting coffee is shown in Fig. 20. When housewives learn how much better and how much cheaper fresh and home roasted coffee is, there is little doubt of the utility of a roaster like this, which is safe and easily manipulated.

Alcohol, because of its almost colorless flame can not be used directly for illuminating purposes. Fortunately, the fact that its flame is colorless is an indication of its high temperature. This in conjunction with its freedom from soot renders it peculiarly suited to produce illumination by incandescence of one of the earthy oxids. When certain earths (oxids) such as thoria are deposited in a woven mantle and suspended over a very hot blue flame, they become intensely luminous. This principle is utilized in the making of an alcohol lamp as shown in Fig. 21. The burner of this lamp is constructed on the same principle as that of the stove described above. Alcohol gas and not liquid is burned. By a simple device a small quantity of alcohol is pumped from the bowl of the lamp



Fig. 20—Alcohol Burner for Roasting Coffee

into a receptacle underneath the gasifying mechanism. This is ignited, produces gas from the bowl which in turn

is ignited, and raises the mantle to brilliant incandescence. The further working of the lamp is automatic, producing an intense and economic light. These lamps are already coming into notable use.

**Motor Power.** Can alcohol take the place of gasoline for power purposes? This question is to be answered by a discussion of price and not of possibility. The engineer has already answered the question in the affirmative in all respects but one. Alcohol now costs about twice as much as gasoline. It will not supplant gasoline until their prices are practically the same. In regard to relative efficiency elaborate experiments have shown that alcohol and gasoline do not vary greatly in this respect. With well constructed engines



Fig. 21—Alcohol Lamp

of moderate size and operating continuously under favorable conditions, it may be said that approximately 20 per cent of the heat energy produced by the combustion of gas is rendered effective. Doubtless inventive ingenuity in the future will increase this efficiency; but the contrary is also true that as generally employed at the present time, the efficiency falls below the percentage named. While alcohol has less heat energy than gasoline in the proportion of about 7,000 to 11,000 it can be more densely compressed in the sparking chamber of an engine, and hence on ignition will give quite as much energy as an equal weight of gasoline. Its safety and other properties make it preferable to gasoline for engine driving and everyone using materials of this kind would feel more secure if alcohol were in general use. It seems reasonable to suppose that the natural

fuels such as gas and petroleum will become dearer as the stores are exhausted, in so far as we know nature is not producing any additional sup-



Fig. 22—Adaptation of Alcohol Motor for Plowing

plies of these substances. On the other hand, it seems reasonable to believe that alcohol will grow cheaper. Hence it seems inevitable that the alcohol motor will surely gain, although slowly, on the gasoline motor and finally win the primacy over it.

One advantage that alcohol possesses is that with no, or very little, adjustment, it may be substituted for gasoline in all existing motors. But this may prove in the end a disadvantage because it must be plain that

power. For instance, it is not possible to compress a mixture of gasoline and air in the hot chamber of an engine which has been running for some time to more than 80 lb. per square inch without the danger of premature auto-explosion. In similar circumstances a mixture of air and alcohol vapor can be compressed to 250 lb. to the square inch before danger of auto-explosion is feared.

The general experience of competent engineers is strongly in favor of the idea that alcohol in a properly constructed engine will prove to be the equal of gasoline as a power producer.

Already experimental automobiles, engines, locomotives, plows, and harvesters, have been constructed and given successful trials. In Fig. 22 is shown a plow driven by alcohol, while in Fig. 23 a mower is exhibited, and in Fig. 24 a harvester and binder is illustrated. It must not be supposed, however, that these apparatus have found any practical use. They are mentioned only to call attention to the possibilities of the future. The steam plow has never become common because it can only be operated on a large plantation. A plow which could be used in a small field will appeal strongly to the farmer who hates to see his horses and mules exhausted by the debilitating temperature of summer.

**Miscellaneous Uses.** Alcohol is exclusively used in many manufacturing



Fig. 23—A Mowing Machine Propelled by an Alcohol Motor

an engine built especially for alcohol will operate more economically than one adapted from gasoline as a motive

and technical processes, and a few of the more important of these will be mentioned.

Alcohol is used extensively in the manufacture of dyes and other products of coal tar.

Smokeless powder could not be made were it not that the nitrated cotton is made homogeneous in character by a

alcohol in the arts can not fail to be of great benefit to the prosperity and progress of our people.

**Conclusions.** In the brief presentation of this important subject contained in the preceding pages, several im-



Fig. 24—Alcohol Motor Used in Reaping and Binding

partial solution in alcohol and ether. The burning and explosive properties of the nitrated cotton could not be controlled in the natural state of the product. Reduced to a paste, however, by the action of ether and alcohol, it can be moulded into hard and hornlike pieces of the shapes and sizes desired.

Varnishes and lacquers are cut by alcohol and this use is one of the most important.

The ether of commerce is made directly from alcohol whether for technical or medicinal use. The widespread use of this solvent is especially promoted by making it from tax-free alcohol.

Imitation silk is made from a partially nitrated cotton dissolved in ether and alcohol, and in this state spun into the fine threads which have the luster and general appearance of silk. This cotton is denitrated by appropriate chemical means before it is converted into cloth, otherwise it would be too dangerous to wear.

A vast number of chemicals and medicines are made from alcohol, as ethyl chlorid, ethyl bromid and iodid, chloroform, chloral, bromoform, iodoform, ethereal salts such as acetate, nitrite, nitrate, acetic acid and acetates, etc.

The effect of the use of industrial

portant conditions are noted which may be properly emphasized by a summary:

1. The manufacture of alcohol in a small way requires special knowledge and experience and, hence, it is not reasonable to look forward to the establishment of such an industry until young men are trained in this art.

2. The successful establishment of agricultural distilleries after such trained experts are provided will depend on the utilization of waste products costing practically nothing, except the cost of handling. If the small distiller has to pay the same price for his raw material he may not hope to compete with large plants and syndicated companies.

3. Only those waste products reasonably rich in starch and sugar can be utilized with success in a small distillery, making approximately 50 gallons of 90 per cent alcohol per day. When the amount of fermentable matter in a waste product falls much below 10 per cent, success in its utilization for alcohol making may not be expected.

4. Alcohol is a much safer and more agreeable article to handle than gasoline and will replace gasoline for all heating and power purposes just as soon as the cost of the two articles is approximately the same. Even at a

slightly greater cost alcohol will be preferred.

5. Alcohol will be especially valuable to those who live on farms or in small villages rather than to those who live in towns and cities.

6. Alcohol will prove especially valuable for minor heating purposes about the house and for lighting where neither gas nor electricity is available and for small cooking stoves. It will probably be many years before it is used for general heating of houses and public buildings.

7. Alcohol will prove highly valuable for light engines and motor cars and may, in the distant future, be used for traction purposes and for driving farm machinery.

8. The price of natural gas, coal and petroleum will doubtless continue to advance as consumption increases and the natural stores grow smaller.

On the other hand, the probabilities are that the price of alcohol will not advance, but decrease.

9. The expectations that were entertained of a rapid establishment of agricultural distilleries in this country are doomed to disappointment. This industry has not even yet started and its establishment will necessarily be beset by many difficulties. Many years will doubtless elapse before the small distilling industry advances beyond the state of infancy. But that it will grow is attested by the experience of other nations. It is the part of wisdom to tell the sober truth about this matter and to take such steps as may make it possible to realize for the people of this country all the benefits contemplated by the act permitting the manufacture of denatured alcohol free of tax.

(The End.)

## A HOLLAND CANAL BOAT

The illustration shows one of the many steam canal boats that ply between Delft and Rotterdam in Holland. This boat carries both passengers and

freight, long benches being arranged on the cabin top for passengers who desire to ride in the open.—Photo by Miss Beatrice Oliver.

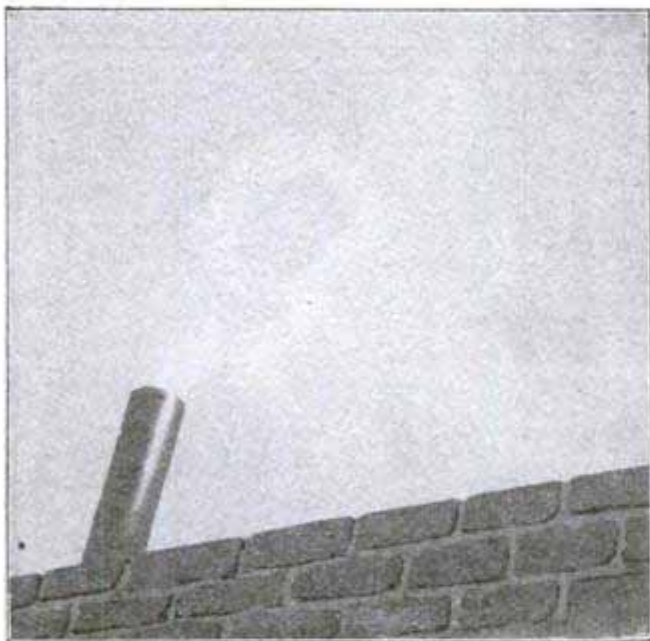


A Holland Water Street

## EXHAUST PIPE BLOWS RINGS

The most accomplished user of tobacco and blower of smoke rings would give up in despair were he to stand for a few minutes outside a certain granite works in Cleveland, Ohio, and witness the methodical and unsurpassable manner in which a steam exhaust pipe apes this hobby of many smoking men. For 10 hours, 6 days a week, it does nothing but puff out rings. These issue from its muzzle once every second, 36,000 times a day, or 10,800,000 times a year of 300 working days. When a strong wind is blowing the rings merely pass over the edge of the pipe, but on a clear, still day the circular puffs chase one another for 15 or 20 ft. before they vanish, and it is possible to watch for hours without seeing an imperfect ring, although sometimes one ring catches another and forms a ring within a ring.

Just why the exhaust pipe blows rings instead of behaving as do ordinary exhaust pipes the factory employes are at a loss to explain, but some believe that by some accident in the process of its manufacture it was rifled at the end, or when it was set up someone banged the summit into a freakish

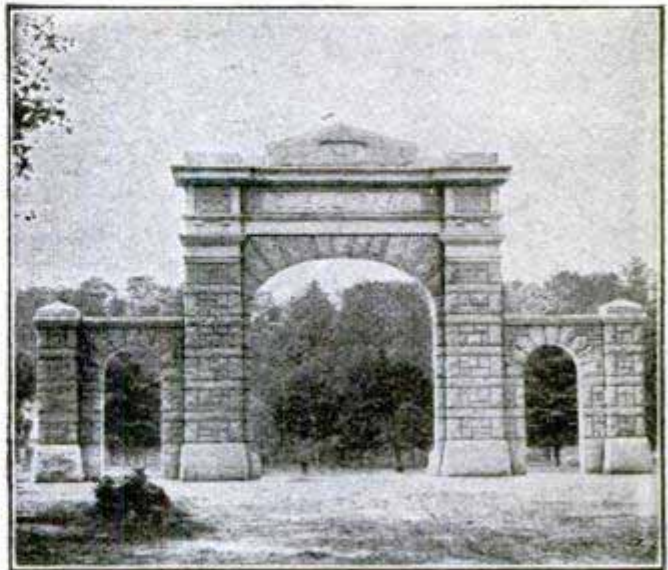


Ring Blown from Exhaust Pipe

shape, while others believe that perhaps the pressure of the puffs is just suited for the forming of rings.

## ENTRANCE TO FRANKLIN, N. H., PARK

The stately entrance to this park in Franklin, New Hampshire, was pre-



Artistic Park Entrance

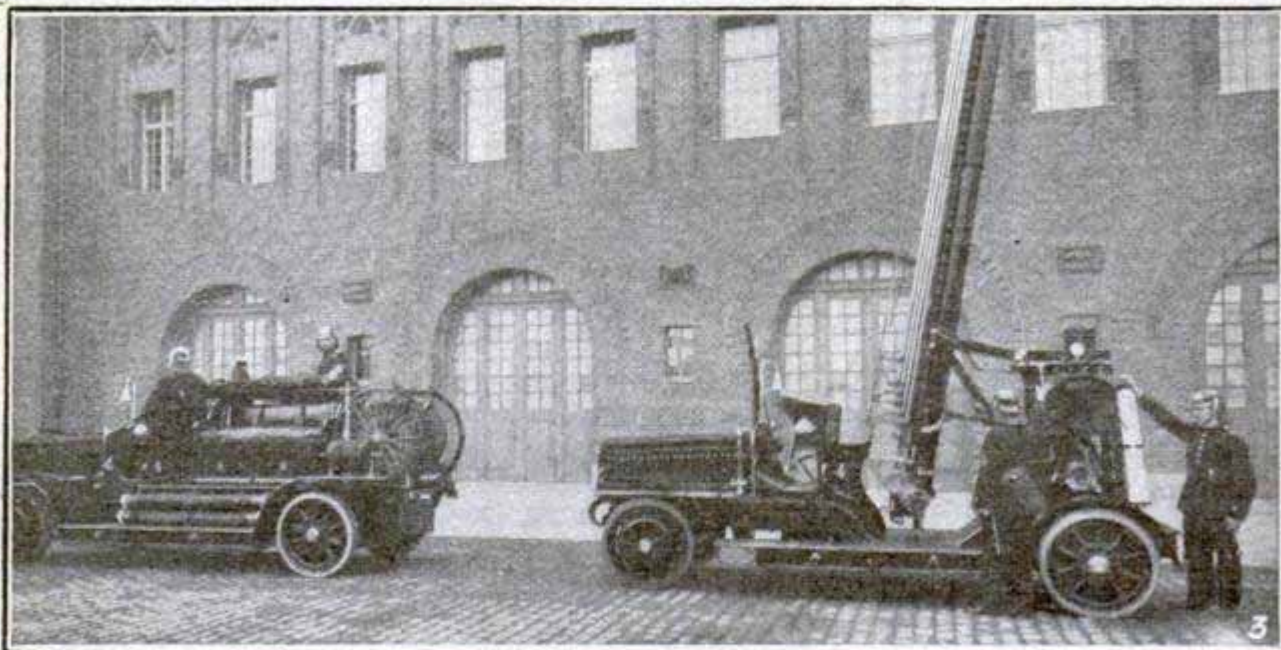
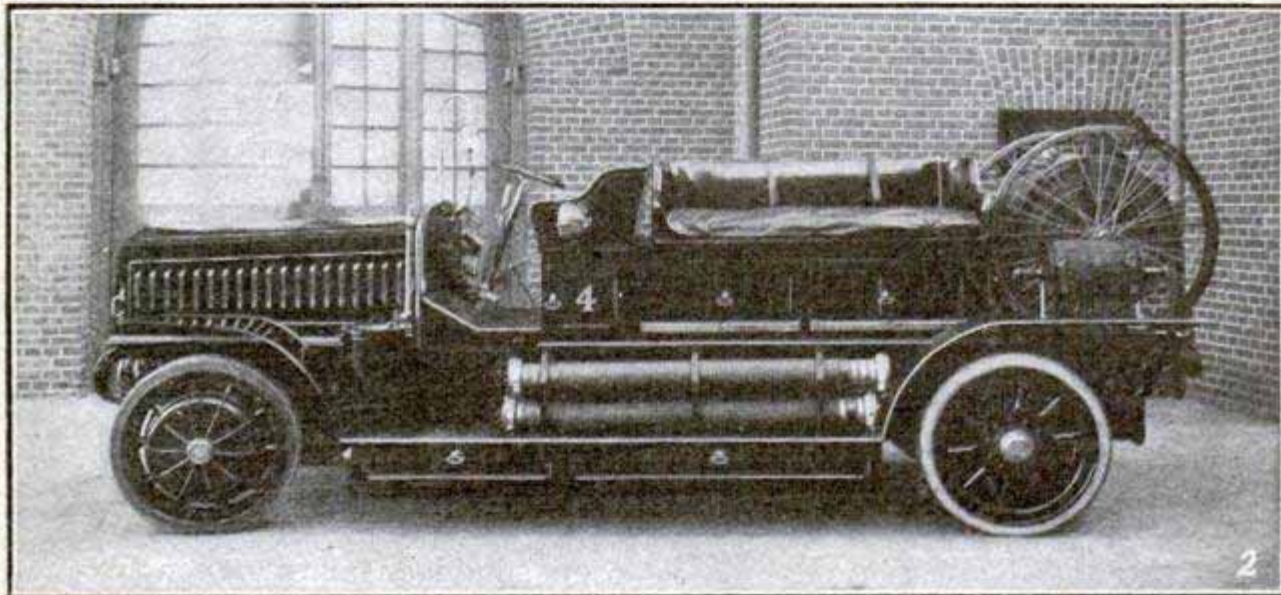
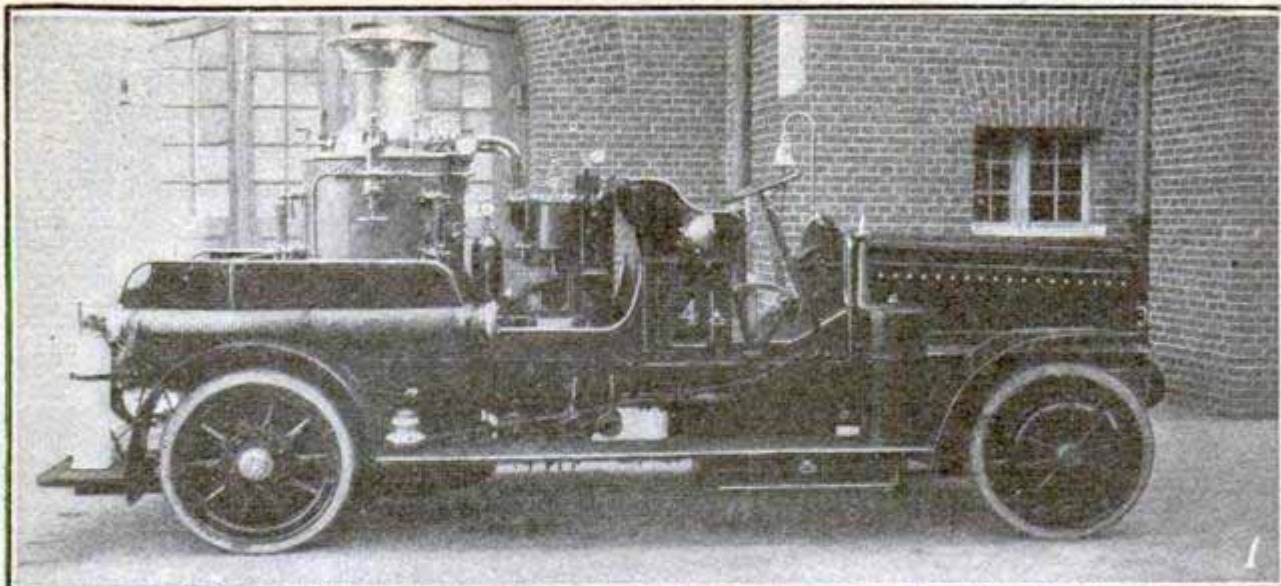
sented to that city by Mrs. W. J. Odell as a memorial. It is constructed of Concord granite, is 40 ft. wide and 26 ft. high, and cost \$5,000.

## GONGS CLEAR PATH FOR FIRE APPARATUS

Gongs on the patrol boxes at street corners in the business district of Chicago sound an alarm when fire apparatus is to traverse the street in which the boxes are located, this warning giving the crossing policemen an opportunity to clear the blocks of street under their jurisdiction before the apparatus arrives. Delay that is often caused by the difficulty in guiding engines and trucks through crowded thoroughfares is thus eliminated.

When a fire alarm is sounded, an operator at the central police station determines by a specially prepared map showing the routes taken by the apparatus of the different fire stations just what streets must be cleared. He then causes the gongs on the patrol boxes in these streets to ring and the patrolmen clear the way.

The Chilean government has electrified 750 miles of the railroads in that country.



Berlin Steam-Gasoline Fire Engine—Auto Tender That Is Also an Ambulance—Auto Tender as Ambulance and Remarkable Extension Ladder



## GERMAN FIRE-FIGHTING AUTOMOBILES

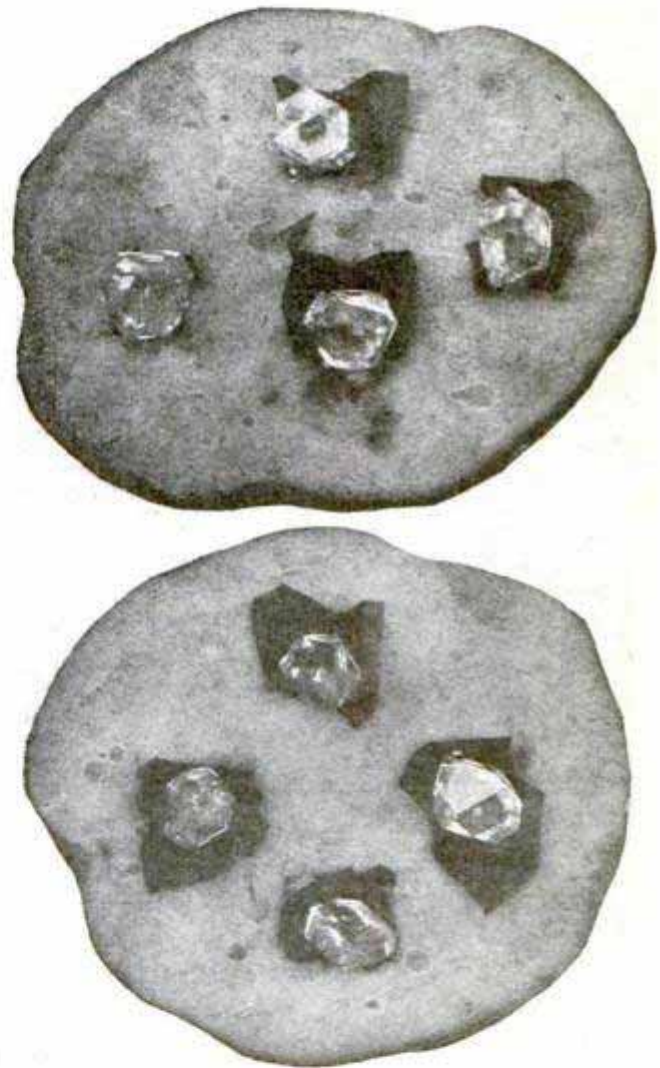
Although many American cities now have automobile fire-fighting apparatus, it is safe to say that none is of more interest than these three machines of one of the stations in Berlin. All three form one brigade. The first is the pumping equipment, consisting of an ordinary steam fire engine mounted upon an automobile truck which is propelled by a gasoline engine of the multi-cylinder type. The second is a tender to the first. It is equipped with a hose reel, couplings, nozzles, and two side seats that will accommodate several firemen. The backs of these seats can be raised to form a stretcher, as is shown in the third illustration, thus converting the tender into an ambulance when necessity requires. The other machine in the third illustration carries an extension ladder. This is raised by compressed air, furnished by a separate engine mounted at the back of the automobile. The air is driven or compressed into the tube or pipe running along the back of the ladder. The upper end of the pipe is, of course, capped, and the force of the air drives its extensible sections upward to a height of 75 ft.

Another German fire station at Schoneberg has several additional features of interest, although illustrations are not available. Each brigade consists of three automobiles, one operated by steam and the other two by gasoline. The steam-driven machine is the fire engine, the steam power being used to furnish both water and motive power. The gasoline propelled cars are a chemical outfit, having a vertical cylinder of 120-gal. capacity, and a hose car which carries considerable hose, and an extension ladder and life-nets and respiratory apparatus as well. This car leads the brigade in the rush to answer an alarm. It carries at its back a direction indicator consisting of an electrically-lighted semaphore. If this is kept in a vertical position, the cars following are notified that they are to travel straight ahead. When dropped

to a horizontal position the cars behind know that a turn is to be made at the next street crossing, the direction of the turn being indicated by the direction the semaphore is pointing.

## DIAMONDS SHIPPED IN POTATOES

A most ingenious method of packing diamonds for shipment between the South African mines and London is now being resorted to. It is none other

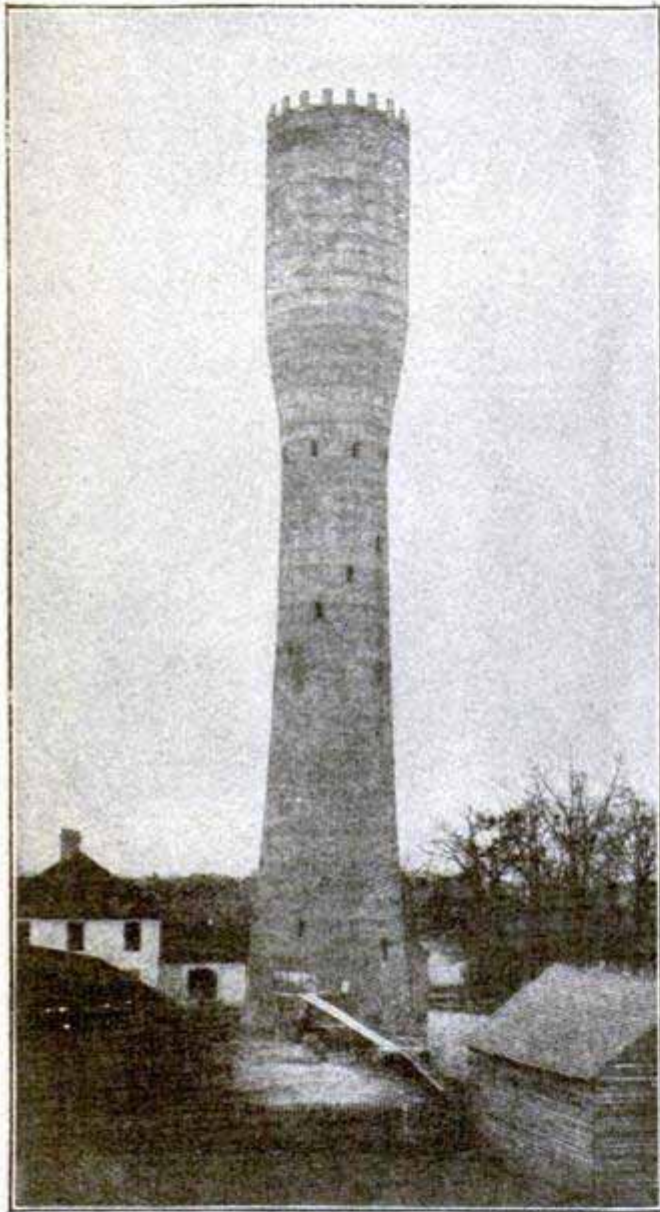


How the Diamonds Are Packed

than placing them in potatoes, and adds one more item to the list of uses that vegetable is adapted to outside of its quality as an edible. Incased in potatoes, there is no danger of the precious stones cracking on the voyage, as is often the case otherwise. The idea is worthy of a diamond smuggler.

## WATER TANK LIKE CASTLE TOWER

The reinforced concrete water tower here illustrated is interesting because



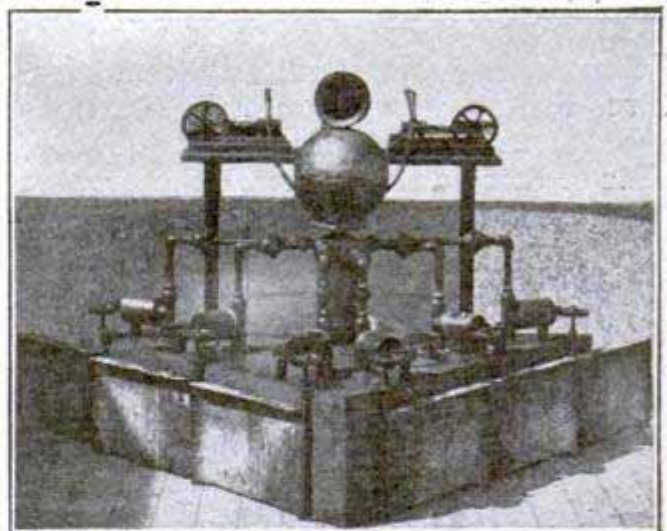
Concrete Water Tower

of its great capacity and because of its artistic appearance. It somewhat resembles the tower of an ancient feudal castle, stands 150 ft. high, and has a capacity of 160,000 gal. It is located at Belton, South Carolina.

## ANOTHER WAVE MOTOR

Next to perpetual motion there are probably few ideas upon which so much time and money has been spent as in the effort to devise a successful wave motor. Many of them have, apparently, been able to develop power from

sea waves, but the cost of building and maintenance was out of all proportion to the power derived. Most of the machines have been devised to absorb the power created by the buoyancy of the waves. The one illustrated herewith is designed to absorb the power from the roll. It is the invention of George C. Hale, ex-chief of the Kansas City, Mo., fire department, who invented most of the fire station apparatus now in general use. A test of the motor recently was made at Ocean Park, Los Angeles, Cal., in the presence of several engineers. The Hale machine sets in a sort of a trough with the blades open in the starting position. The incoming wave pushes the blades backward and then is deflected so as to strike the rounded corners of the trough and push them open again. These blades operate the levers on small air compressors, from which the air is forced into a tank. From this it is led in pipes to the engine. The model ran two small engines at full speed with mechanically created waves. The machine tried at Ocean Park was larger, with blades 4x6 ft., and it is calculated that it produced 15 hp. No steps have yet been taken to commercially utilize



Absorbs Power from Waves' Roll

the machine, as the inventor believes it can be further improved.

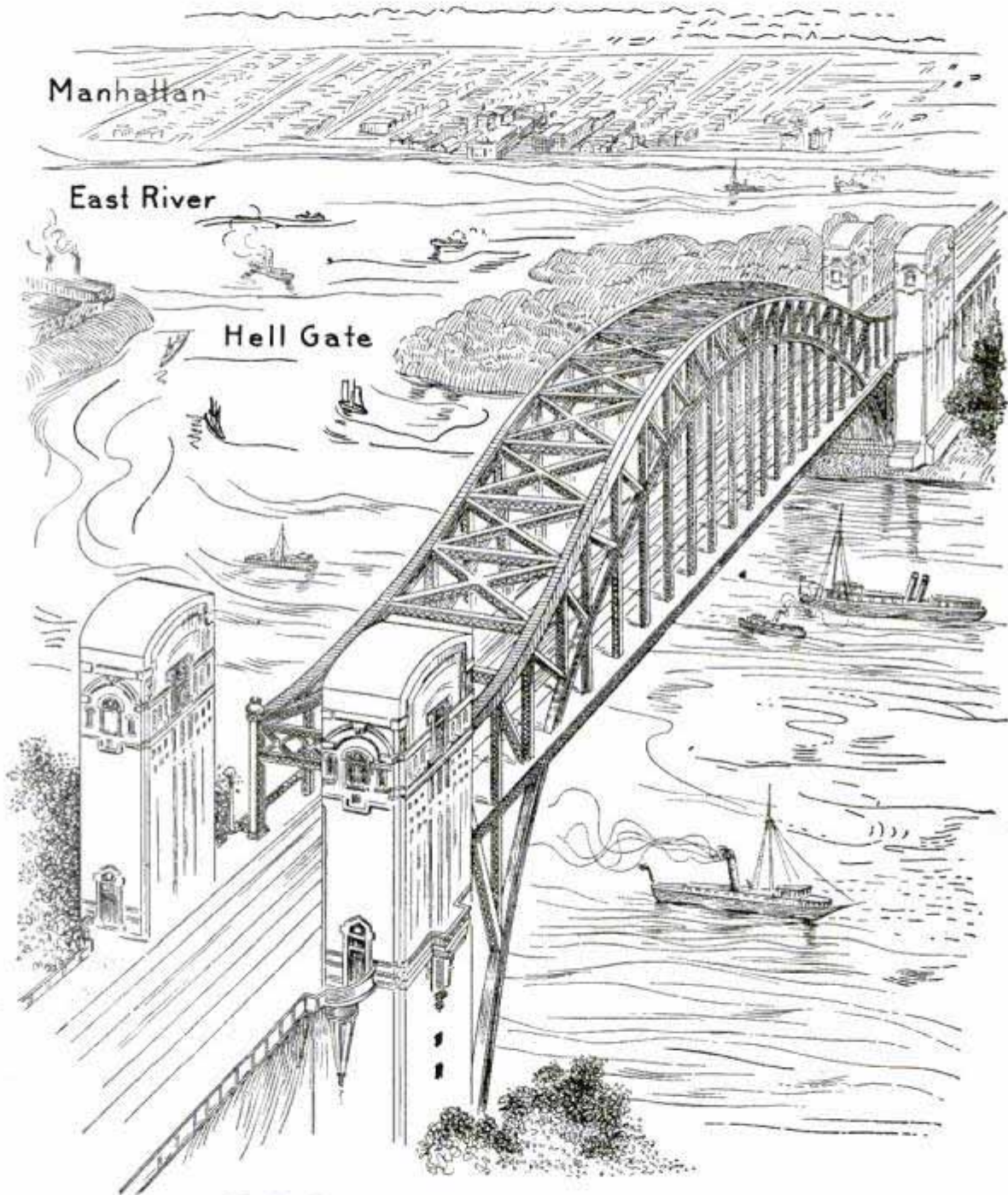
The Pennsylvania Railroad has practically completed its 4-track line from Pittsburg to New York.

## GREAT STEEL SPAN TO CROSS EAST RIVER

The new railroad bridge to be erected across the East river by the New York, New Haven & Hartford railroad will have the longest steel span in the world. It will arch itself over a distance of

bridges from the city hall to the Bronx river.

Some of the other Brooklyn bridges will be longer from end to end than this new bridge, which will be the only

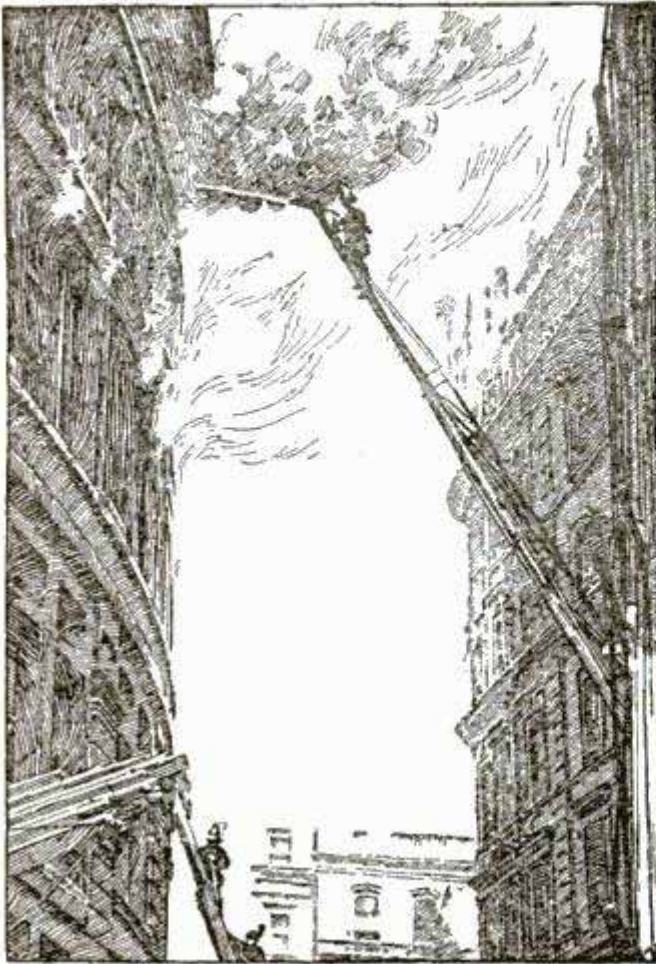


To Be Longest Steel Span in the World

1,000 ft., and the railroad floor will be 220 ft. above the surface of the river. When it is completed New York will have five bridges to Long Island, and Manhattan, the Bronx, Queens, and Brooklyn will be gripped together by

one built by private enterprise, but this will be longest as an arch.

The United States has about 40,000,000 telegraph and telephone poles in use, valued at \$200,000,000.



Fighting a Fire in London

### MOVING A TOWN BY TRAIN

It became advisable to abandon the town of Rock Creek, Texas, a coal mining settlement owned by one of the railroads of that state, therefore many of the houses that formed it were transported bodily on flat cars to other locations. The first five cars of the train shown in the illustration each carry a two-room cottage 14 ft. wide, 28 ft. long, and 15 ft. 8 in. high. On the next three cars are lean-to kitchens that had

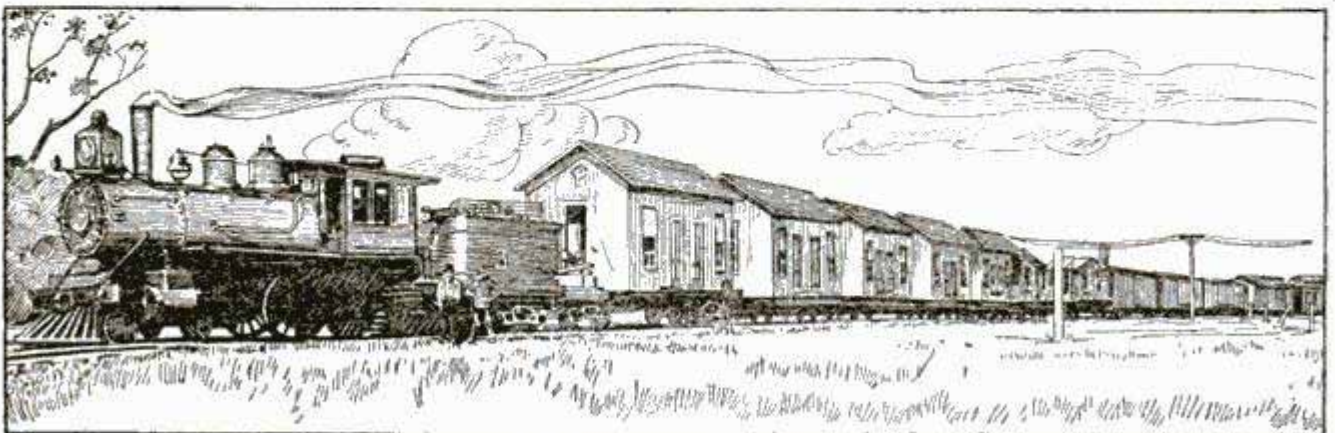
formed parts of these houses, and four box cars at the end of the train carry smaller parts.

### BOX TRAP FOR CATCHING MOSQUITOES

Ridding a house of mosquitoes by catching them in a box trap is a practical method now being adopted in India through the work of H. Maxwell Lefroy, Imperial entomologist. The trap is a box 12 in. long, 12 in. wide, and 9 in. deep, lined with a dark green baize, and provided with a lid or swinging door. A small hole covered by a revolving piece of wood or metal is necessary at the top, and the bottom of the box should have a tin floor.

This trap is placed, open, in one of the rooms of the house, and the book shelves, hangings, etc., are dusted or shaken out. This disturbs the mosquitoes and they take refuge in the bottom of the open box, which imprisons them when the cover is swung shut. A teaspoonful of gasoline is then dropped through the hole in the top, above mentioned, and in five minutes the vapor will have taken effect and the stupefied insects may be shaken out through an opening in the side and the trap reset. The bodies should then be burnt or otherwise destroyed.

"The best times for making catches," says H. Maxwell Lefroy, "are an hour after sunrise and at mid-day. The trap will not catch all mosquitoes, as all do not have the same habits, but it is effective against the common mosquito in India, having myself captured as many as 600 in a day. The mosquito



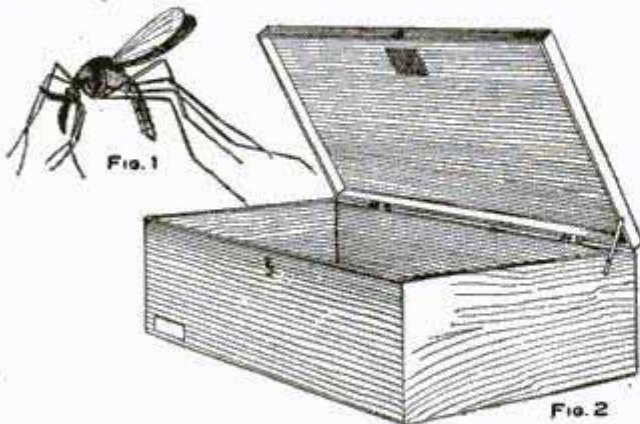
A Trainload of Houses .



A River of Timber

comes into the bungalows at sunrise and seeks shady spots to sleep in. They then arise refreshed at sunset, have an orchestral dance in the dusk, and go forth to seek food, some of the females remaining to suck blood. When it is possible to entirely close the house at sunrise, the mosquitoes cannot come in after their night out and their numbers in the house will be immensely reduced.

"I am not, however, prepared to recommend the box trap as a universal remedy. All the mosquitoes are not ex-



Indian Mosquito and Box Trap for Catching It

terminated by it, but so large a proportion is destroyed, if sensibly used, that practically the inmates of the house cease to suffer."

## LOG JAM IN A MONTANA RIVER

The logs shown in this illustration are part of a great jam in the river at Bonner, a lumber town near Missoula, Montana. A large lumber plant is shown in the background.

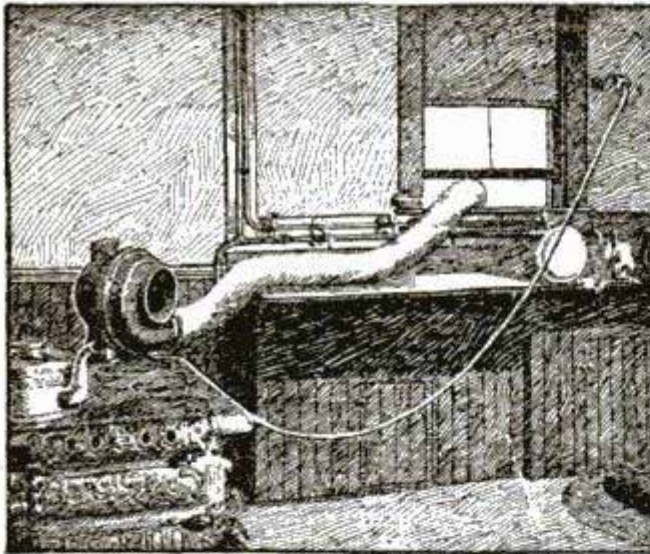
## MONEY RETURNS AT RHEIMS GREAT

Millions of dollars were spent at Rheims during aviation week in admissions to the field, refreshments, and accommodations, to say nothing of railroad charges in getting there. On the last day there were 200,000 paid admissions, and 100,000 more persons witnessed the flights from high ground near by.

Even more significant to the welfare of the aerial industry is the fact that manufacturers of aeroplanes of different types took orders for 52 machines during the week. These ranged in price from \$2,000 to \$5,000, and the majority of orders were from persons who had not previously been especially interested in aviation.

## ELECTRIC VENTILATING FANS

The ordinary electric desk fan is used in thousands of homes, offices and stores for ventilation purposes,



A Fan That Really Ventilates—Fan Ventilating Kitchen

but the ventilation is not real, because the foul and overheated air is not removed, only agitated. An electric fan set is now being placed upon the market which produces real ventilation. It does not stir up overheated and vitiated air and send it whirling around the room, but removes it completely, so that fresh, pure air may take its place.

The ventilating sets are built in three sizes, the smallest weighing about 25 lb., and the largest 50 lb. The 25-lb. set is easily portable from room to room, and will remove about

150 cu. ft. of air per minute. The sets consist of a small dust-proof fan of the multivane type, which is the latest development in centrifugal fans, an alternating or direct current motor, and a flexible canvas hose which acts as the outlet.

The illustrations show the equipment as used in a living room and in a kitchen.

## ARMING OF THE BRITISH COLONIES

That the providing of "Dreadnoughts" for England's defense is not all that is desired by many thinking men in England as well as in the colonies themselves is made apparent by an address of Admiral Lord Charles Beresford during his mission in Canada.

"'Dreadnoughts' are only for going along with a large fleet," said Lord Beresford. "We want cruisers, and will have them. If the trade route between Canada and Britain is not kept clear during war, disaster will follow. Armed tramps are what we fear during war, and it is cruisers that must be depended upon to prevent commerce being destroyed by them. For the colonies cruisers are much better, as the idea of protecting Britain and weakening the defense of the colonies is all wrong."

In connection with this statement it is of interest to note that in addition to providing for a \$10,000,000 "Dreadnought," New Zealand is to have a fleet of three \$4,000,000 cruisers, six torpedo boats, and four submarines.

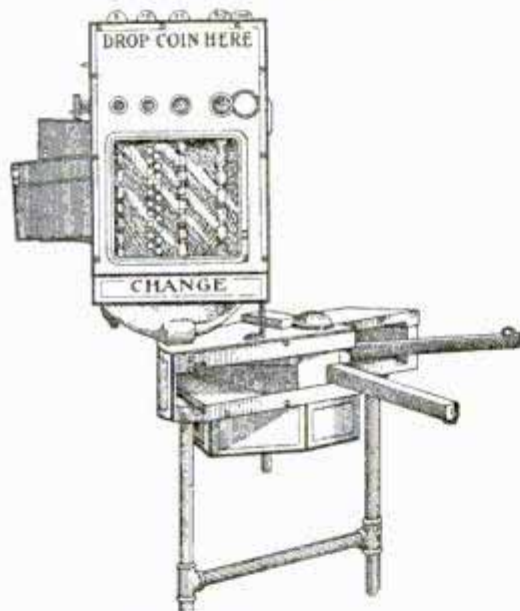
## AUTOMATIC FARE REGISTER MAKES CHANGE

A company in New York is manufacturing an automatic fare register which also makes change for the passengers. It is designed for pay-as-you-enter street cars and works as follows: At the top of the machine is a series of five slots, in which a passenger may deposit a 5-cent, 25-cent, 50-cent, or \$1

coin. The falling coin registers a fare and also operates the change-making mechanism so that if more than 5 cents is deposited, the proper amount of change falls into a change cup located under the machine. At the same time the lock of the turnstile is automatically released, leaving it free to revolve so that one passenger can pass through.

To permit passengers with transfers to pass through the turnstile, the machine is fitted with a lever at the bottom of the turnstile case by which the conductor can allow transfer passengers and other non-cash fares to pass through the stile and register them.

If a coin is deposited in the wrong slot, it is ejected from the case and falls into the change cup to be replaced

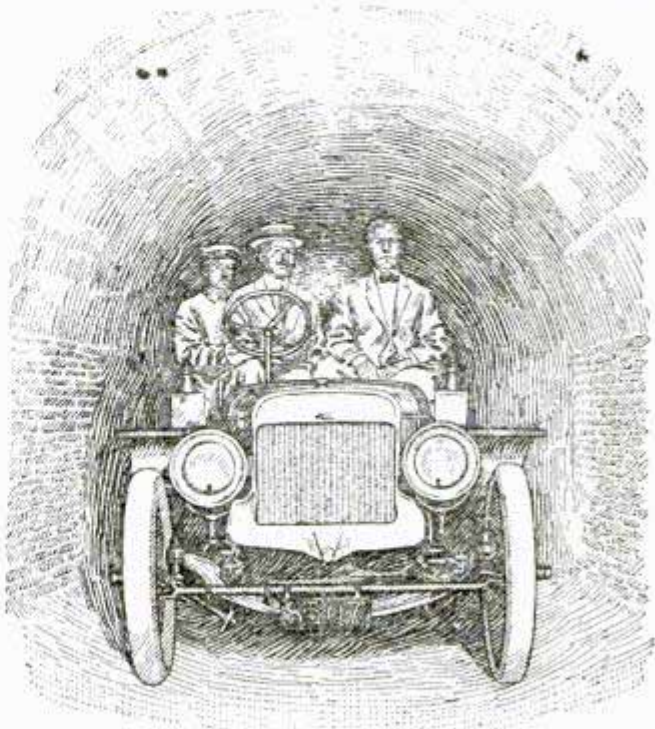


Fare Register and Money Changer for Street Cars by the passenger in the proper slot. If any person tenders paper money, the conductor supplies him with change so that he can deposit his fare in the fare box.

### AUTOMOBILE RUNS THROUGH SEWER

Automobiles, although designed for travel on the surface of the earth, have been taken up in the air by balloons and are being used in tunnels, but this is the first time on record, as far as now known, that an automobile has been used to travel a sewer. The illustration shows a large touring car in

the new \$1,500,000 sewer in Baltimore. The tube is  $5\frac{3}{4}$  miles long, 11 ft. high



Traveling a Sewer by Automobile

by  $12\frac{1}{4}$  ft. wide, and at points reaches a depth of 70 ft.

### PROTECTING ENGLISH HARBORS WITH BOOMS

Since the British Admiralty has abolished submarine mines from the scheme of harbor protection, booms have been experimented with more or less successfully. While it is conceded that the boom is no protection, or at least very little, when large fighting ships are concerned, it is believed that

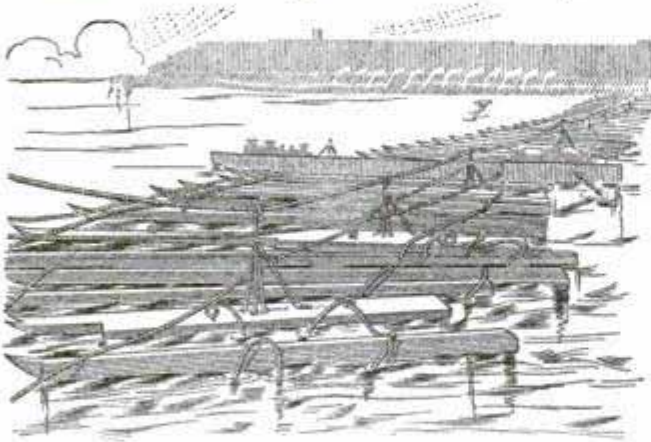


Permanent Concrete Boom in Portsmouth Harbor

such a device will prevent small craft, such as torpedo boats and destroyers,

from entering on their mission of destruction.

The illustrations show two types of booms now being constructed by the



Movable Boom That Is Dragged Across Inner Harbor

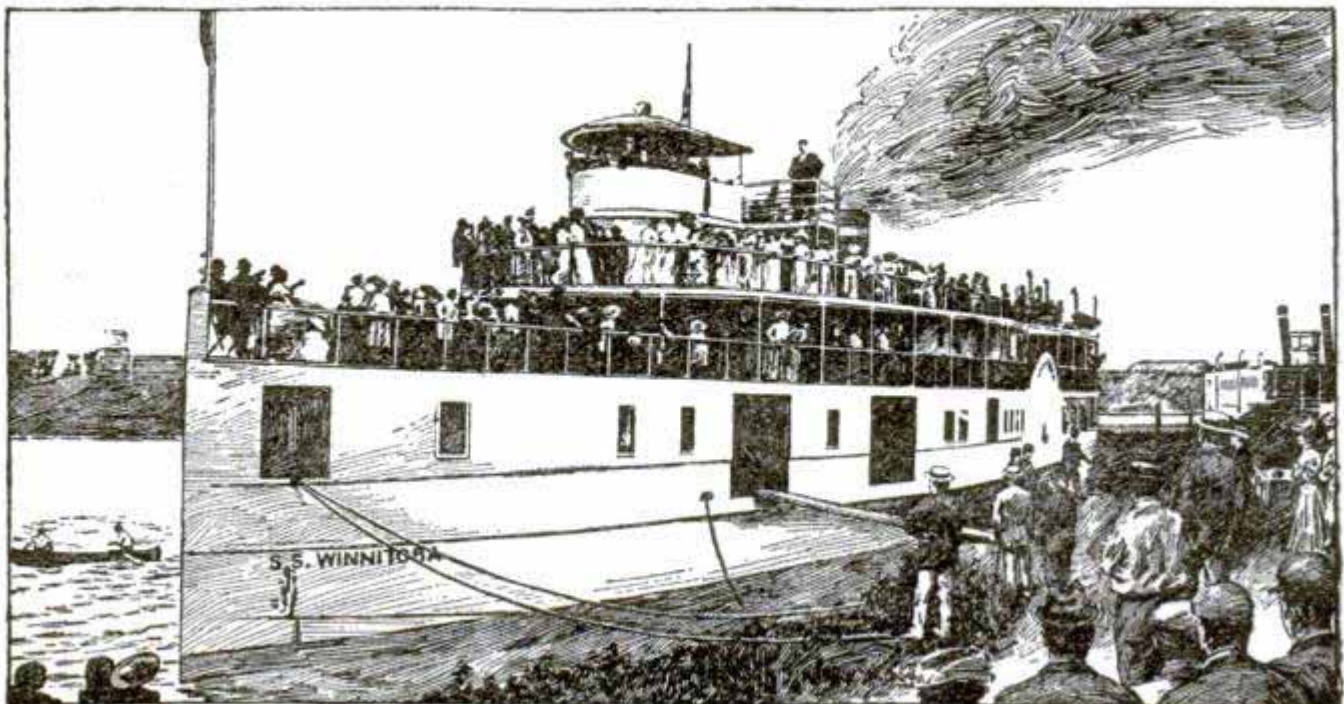
English. The first is a permanent boom of concrete in the outer harbor. It cannot be used, however, to completely shut off an entrance, its mission being to confine that entrance to a certain width. The other boom is of the portable type, and is designed to be stretched completely across the inner harbor. It is composed of 120 heavy beams of wood, each 40 ft. long and 1 ft. square, held together by iron chains and wire haulers. Each beam is armed with a number of huge, curved iron spikes, sufficiently strong and sharp to pierce the bottom of any torpedo boat or destroyer afloat.

A scheme is also being worked out by which the boom can keep submarine craft out as well as vessels that travel on the surface. This involves the suspending from each of the 40-ft. beams a smaller weighted boom, and to place along the cables that connect the two, a number of submarine mines. A submarine, striking one of the cables in this network could not help coming in contact with one of the mines, and the resultant explosion would certainly sink it.

### LARGEST BOAT ON CANADIAN RED RIVER

The side-wheel passenger steamer here shown is the largest ever floated on the Red river. It will run from Winnipeg through the river to points on Lake Winnipeg, this now being possible through the completion of the Andrews locks, described in a recent issue of this magazine.

The boat, known as the "Winnitoba," is 187 ft. long, has a 44-ft. beam, and is driven at a speed of 19 miles an hour by two 250-hp. engines. She will carry 1,500 passengers on the river and 1,000 on the lake, with sleeping accommodations for 225. When loaded to full capacity the displacement is 6½ ft.



Canadian River Passenger Steamer



## TESTING THE HARDNESS OF METALS

By J. C. Miller

Ever since man began to work in metals he has been striving for some method to test the hardness of his products. To secure hardness has been his aim and to be able to reproduce this hardness repeatedly has been the "will-o'-the-wisp" that has led him on and in many a weary chase. We read frequently of some one who has rediscovered the art of tempering copper but how hard it is we are never told.

To the man who is hardening steel there always is a question as to how hard his products are. Will the edge of this tool he has tempered stand up to its work, and is the present output equal to the last in this essential of hardness? To cut out the element of guesswork and bring the quality of hardness to a point where it can be measured is the province of two quite different forms of apparatus recently put on the market.

In the first machine, shown in Fig. 1, a hardened steel ball is used. The sample under examination is placed

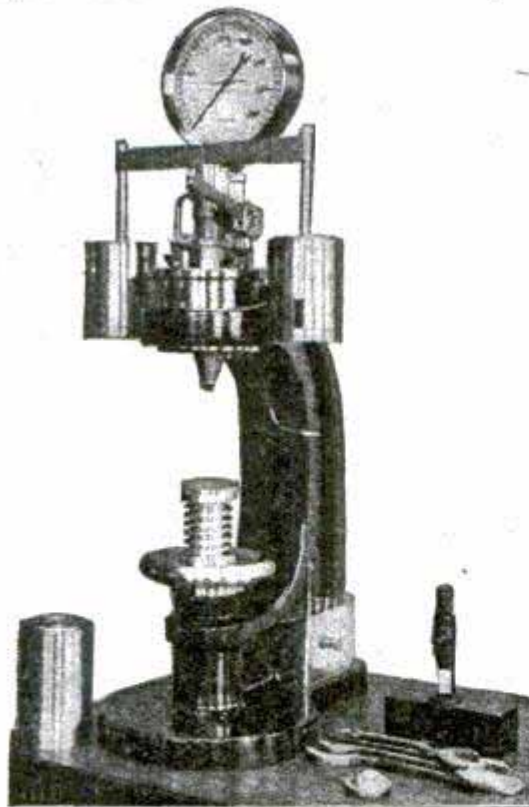


Fig. 1—Instrument for the Ball Test

upon the stage and upon this a steel ball is brought and forced to make an

impression in the sample. A form of hydraulic ram is used to produce great pressure and the amount of depression is measured by microscopes to any degree of accuracy. The gauges indicate the pressure and allow it to be reproduced.

The other machine uses a totally different method. In this, a small hammer is dropped a distance something less than a foot, falling freely in a glass tube. This hammer strikes upon the sample which is likewise placed upon a stage and the distance the hammer rebounds is noted. This rebound is proportional to the hardness of the pieces tested. This machine is shown in Fig. 2 and is small and convenient to use. The machine is so built that the fall of the weight is free from all external influences and the tests repeat themselves.

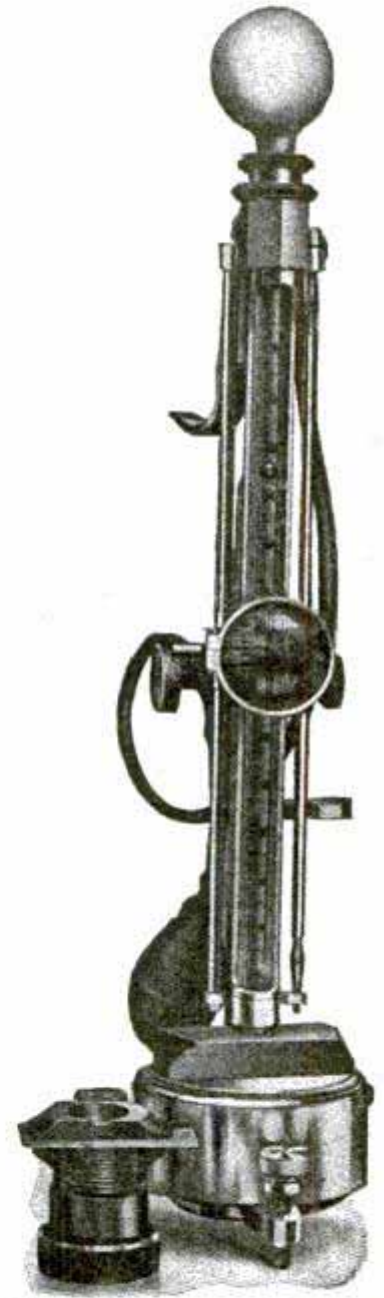
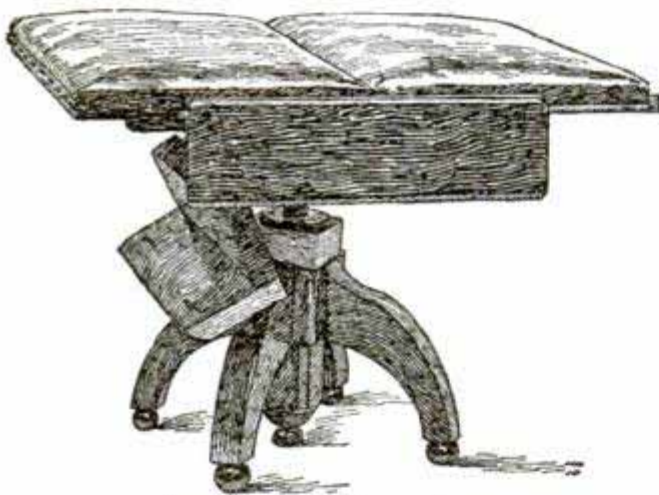
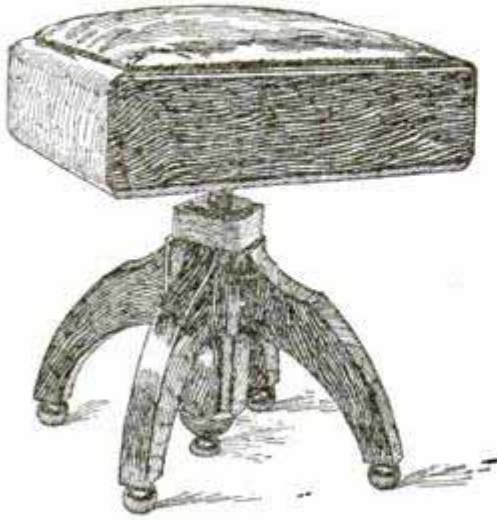


Fig. 2—Scleroscope—Dropping Test

These two machines, the one a foreign invention, the other "home grown," mark a positive advance in the realm of science where previously intelligent guesswork has held undisputed sway.

### EXTENSION PIANO STOOL

A piano stool that will accommodate but one player under ordinary circumstances, but which can be extended to



Accommodates Two Players

accommodate two when duets are to be rendered, has been patented by a Chicago inventor. The illustrations show its appearance as a single and as a double stool.

### THE NEW JAPANESE LINERS

The construction of the Chicago, Milwaukee & Puget Sound railway

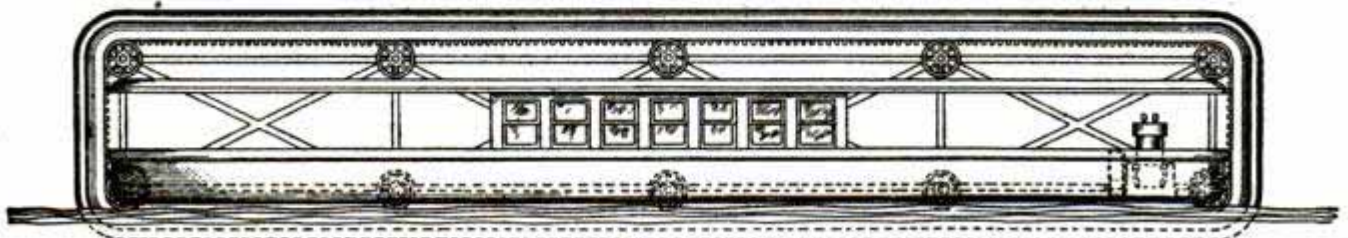
from the Mississippi valley to the Pacific coast is a triumph of American capital and engineering ability, yet the fleet that connects this great system with the far east is being built in a foreign land and operated under a foreign flag.

The "Tacoma Maru" and "Seattle Maru," are the trans-Pacific liners in question, and in having them built in Japan, manned by Japanese officers and crew, and flying the Japanese flag, the railroad interests, according to the Marine Review, take advantage of the Japanese construction bounties, and receive subsidies from the Japanese government, which reduce its operating expenses and help to crush American shipping on the Pacific.

The quarrel should not be with the railroad interests, says the same source of information, for to operate these vessels under the American flag without government aid would be financial suicide, but with the congress that allows such conditions to exist.

### SCOTCH WATER AUTOMOBILE

A Glasgow, Scotland, inventor has devised a unique boat which he designates as a water automobile. The craft, which is about 40 ft. long, is encircled by an immense, inflated rubber tire, 3 ft. wide, which travels around wheels at each end of the boat and over intermediate wheels. To assure stability, outriggers are attached to each side, these being normally clear of the water, and a roofed cab for passengers is placed in the center. The tire is driven by a high-speed motor geared to the wheels at the bow and stern, and the boat is supposed to travel in the direction of the moving tire.



Unique Automobile Boat

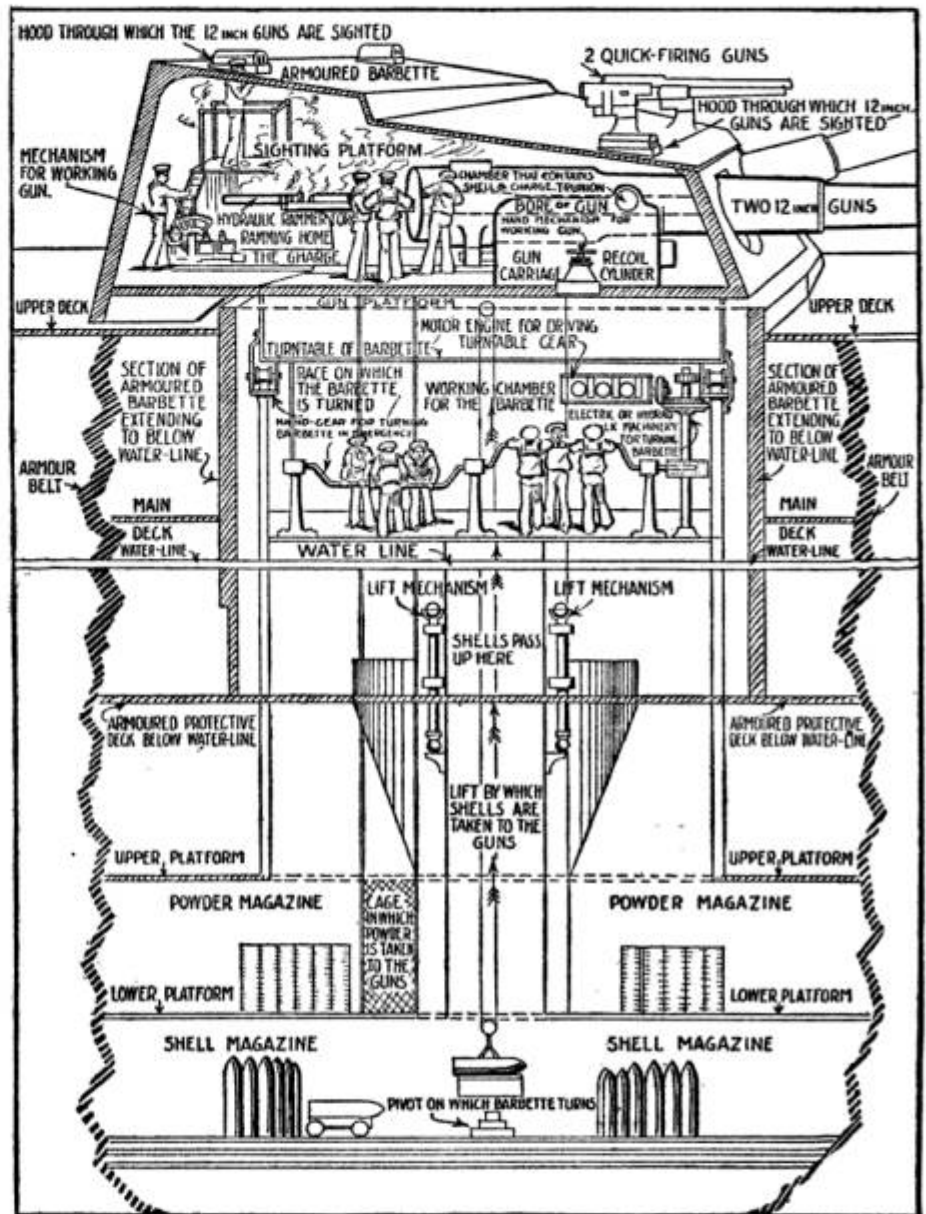
Courtesy American Marine Engineer

## MECHANISM OF A 12-IN. GUN'S BARBETTE

The working of a 12-in. gun, the most powerful weapon now in use on battleships, is clearly shown in this drawing of the interior of a 12-in. gun's barrette on an English "Dreadnought." Everything is complete from the shell magazine far down beneath the guns to the hoods on the top of the barrette through which the guns are sighted.

WAX FROM DE-  
SPISED MEX-  
ICAN WEED

The candelilla weed, a desert plant which grows abundantly upon millions of acres of semi-arid land in Northern Mexico and parts of Texas, Arizona and New Mexico, contains from 3 to 4 per cent of wax, which is now being extracted by a process invented by a resident of Monterey, Mexico. The manufacture of this vegetable wax is already said to be on a paying commercial basis. Extracting plants are being worked in Mexico, and a number are to be started in New Mexico.



Courtesy London Illustrated News

Inner Workings of a Great Gun

fore the pilot could check the airship's movement. It was brought back to the ground and the boy, although unconscious, was released without serious injury.

BOY CARRIED 600 FT. HIGH  
IN AIRSHIP ROPES

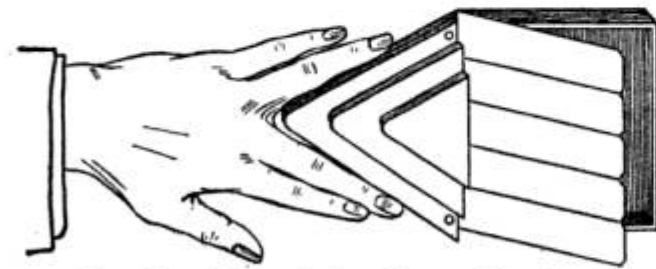
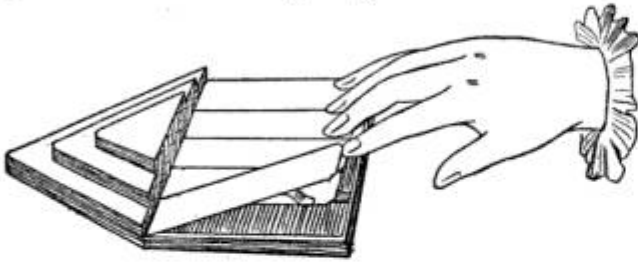
When the Parseval dirigible airship rose at Frankfort, Germany, on Sept. 16, with Miss Catherine Wright, sister of the aviators, as a passenger, a boy became entangled in the loose rigging and was carried, swinging head downward, to an altitude of 600 ft. be-

POCKET DEVICE EXERCISES  
FINGERS

It is very important that the fingers be supple for playing the piano, violin, or other musical instruments with keys or chords, yet a French invention is the first really practical and simple device designed for such a purpose.

It is called the "epigona" and can be

carried in the pocket for frequent use. One part of it is composed of five keys provided with springs so that some



The Two Parts of the Finger Exerciser

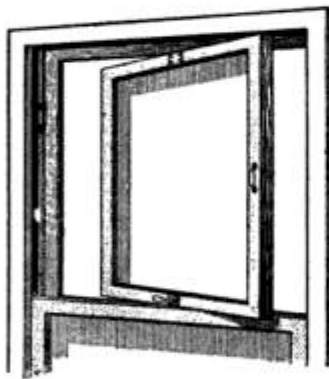
force is required to press them down. The other portion of it is composed of triangular tiers in graduating sizes, used as shown in one of the drawings. This exercises and makes strong and supple the muscles used in spreading the fingers.

The use of the instrument is specially recommended in instances where a musician must play shortly after coming in from a ride in cold weather.

### VERTICAL-PIVOTED WINDOWS FOR SKYSCRAPERS

The window shown in this illustration is set in a frame within a frame in such a way that it can be opened at almost any angle and locked positively against the wind. When closed it is waterproof, no matter how hard the rain is beating against it.

The window is adapted for use almost anywhere, but its special purpose is for the upper stories of skyscrapers, its capability of being swung inward greatly facilitating its washing from a solid footing

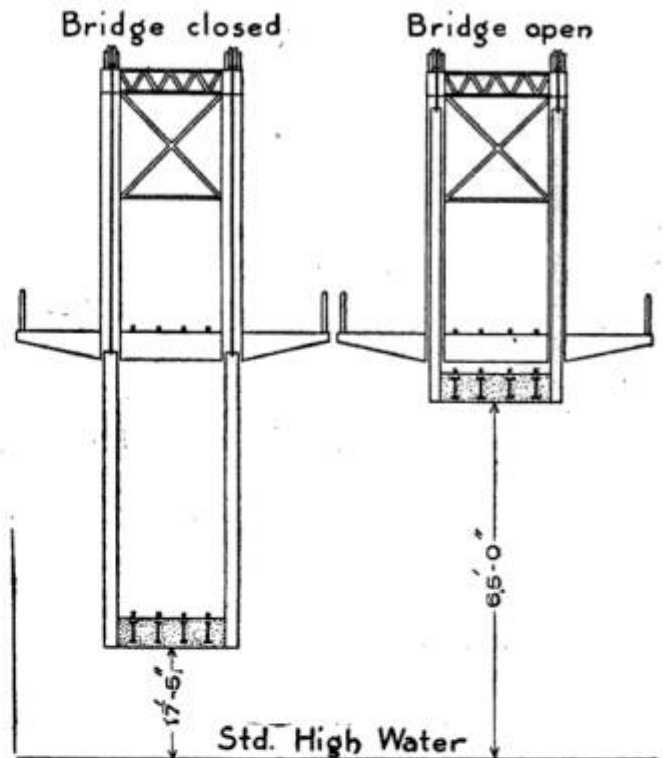


inside instead of a precarious one outside. When desired the outer frame can be raised or lowered as in the present type of window sash.

### BRIDGE TO HAVE TELESCOPIC DECK

Engineers have devised an unique bridge to span the Missouri river at Kansas City, Mo. It is to be a three-span, double-track and double-decked affair, the lower deck of which is to telescope into the upper deck to allow river traffic to pass under. The upper deck is for electric interurban, wagon, and pedestrian traffic, while the lower is for steam roads. The idea of the telescopic deck, or span, was evolved because of the necessity of a clear passage 400 ft. wide.

Just how the bridge works is shown by one of the drawings. The bottom



deck hangs from the upper by panel posts that telescope into the posts holding the upper deck suspended. The lifting power is applied through wire cables attached to the crown of each panel post, running up through the panel posts of the upper deck and over sheave wheels to counterweights. Electricity will be the operating power.

When the lower deck is thus drawn up there will be a clear space of 60 ft. between its lower chords and the surface of the water. The total weight of the lifting deck will be 1,260,000 lb., and the machinery for its operation and the ferro-concrete counterweights will weigh nearly 2,000,000 lb. It is estimated that the deck can be raised and lowered in less than two minutes.

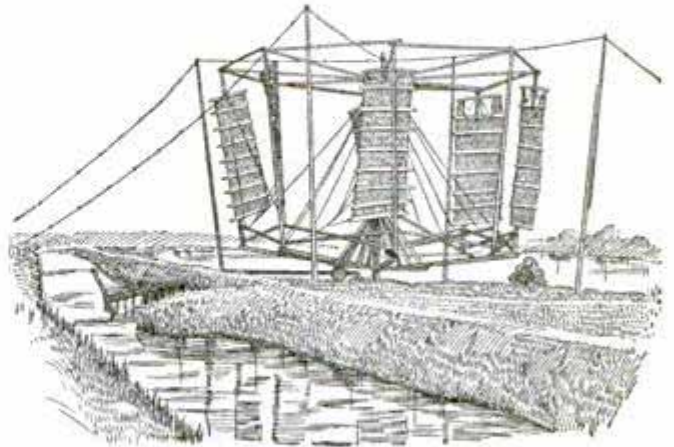
### REINFORCED CONCRETE WATER MAINS

The illustration shows the inforing framework of two units of the reinforced concrete water mains now being used in Paris. The encasing concrete is yet to be placed. The pipe consists of a middle cylindrical shell of  $\frac{1}{8}$ -in. steel, reinforced on the outside with longitudinal and spiral bars, and covered, inside and out, with a fine aggregate concrete.

The units shown by the illustration connect the large concrete main, which is 48 in. in diameter and designed to carry a 280-ft. head of water, with smaller pipe lines. The regular sections of the large main are 14 ft. long, cast at the factory and provided with a special metal flange, which, when the joint is made after the pipe is placed in the trench, is covered with an external band of concrete reinforced with

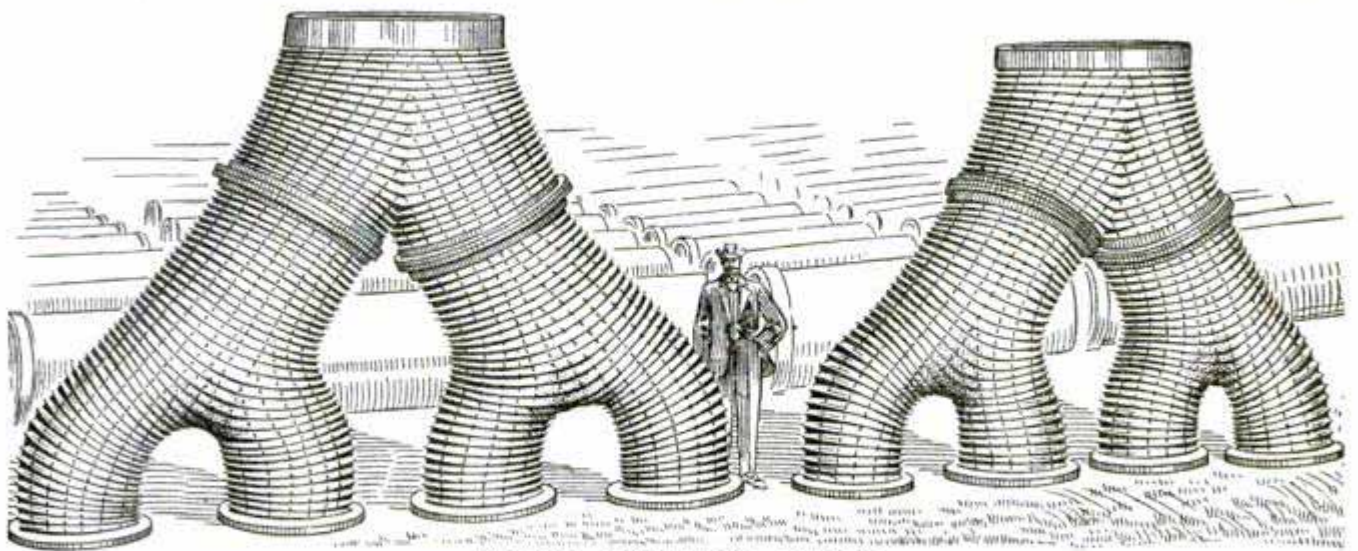
### CHINESE IRRIGATION WINDMILLS

When Chinese rivers are in flood the small-farm producers of that country divert the water into large reservoirs



Irrigation in China

or ponds, and through the dry months distribute the water thus captured to their fields through a system of ditches. This illustration shows one of the windmills of such a system. These mills, which have been in use for hundreds of years, are made in octagonal form. The framework is of bamboo and the planes are a very hard matting. Ropes are provided to set the mill so to catch the wind from any direction, and a system of very primitive gearing works an endless chain on which buckets are arranged to catch the water. The excess of water thus



Concrete Water Mains of Paris

a short length of steel plate. These pipes, with the outer concrete coating applied, are shown in the background.

diverted into the fields is carried back to the main ditch or canal to be used over again.

## THE GREAT WEEK OF AVIATION IN RHEIMS

By A. E. Joerin

Never before have we witnessed such a spectacle as this presented from August 22nd to 29th in Rheims. For centuries past men have dreamed of flying-machines of the most various types. These dreams are to-day a reality.

Young and old, a numberless crowd, have gathered together to witness the world's greatest and first match of flyers. Although the prices varied from \$2 to \$80 per place in the aerodrome, there were seen as many as 300,000 people there in one day.

Most of the types represented were biplanes (double supporting wings), two only have been piloting monoplanes (one supporting wing) and these were Louis Bleriot and Hubert Latham, both well known from the Channel crossing which took place in July.

Young America was represented with the famous Herring-Curtiss flyer who won the first prize for speed, and some biplanes of the types of Wright Brothers', the latter one being piloted by the Frenchmen Count Lambert and Lefebvre.

Germany has not been able to take part with some of their own types, as the results obtained have not as yet sufficiently guaranteed a success. Different it was with Great Britain who won the Grand Prix of Rheims for both duration and distance. Henri Farman is the originator and representative of this wonderful record. Italy is also in the front line and other countries besides.

The great public was specially fascinated with the most elegant and soft flying of the monoplanes which had precisely the aspect of huge birds, real birds, measuring the space with majesty; real princes of the kingdom of the air. The biplanes they (the public) called simply the "boxes" and these were much less in favor of the crowd from the aesthetic point of view. The French like elegance. Never has

man seen anything more wonderful than such a monoplane in the air. But, on the other hand we cannot omit to mention the marvelous accuracy of the Wright flyer which obeys to the movements of the pilot with such certainty that the on-lookers were quite amazed. Just like a swallow the pilot, whose name is Lefebvre, took the most narrow curves, descended with an awful speed and all at once twisted up almost vertically, then circled around like a huge eagle. With one word people shouted to the bold aviator for his wonderful achievements, and with right. Curtiss aroused the greatest attention with the easiness and especially with the great swiftness with which he measured the space. He seemed, however, to somewhat mind the winds while Latham, for instance, paced, so to say, through the air currents as if he were a born storm bird. Farman with his biplane stayed for more than three hours in the air, and the darkness of the advanced nightfall forced him to the ground with more than 15 quarts of gasoline. He it was who made the record of the world with a distance of 190 km., of which 180 only counted because the time was up while he was still circling in the night. He it was likewise, who left the ground with two passengers on board, this being the world's record. For Wright was only carrying one passenger on board.

A strange feature of these flyers is the peculiar noise which they produce. Some call it a rattling, some a whistling, others a humming, but in fact it is a combination of the three and it is quite peculiar. The propeller acts somewhat like a huge siren and with it there may be heard intermingled the noise of the motor.

The French people attribute much enthusiasm to the success of Latham flying more than 150 yds. above the crowd, thus beating the world's record in height. This is, in their eyes, and

with right, of great importance from the strategic point of view. If we can reach the height of, say 500 yds. above the ground, it will be difficult for any one to aim at such a swift bird as Latham even with the best rifles; and the French are right.

Few people ever realized the enormous importance which these records present. The average flyer weighs about 1,000 lb. mounted. And such a weight is lifted from the ground and flies elastically toward the clouds as if it were a plaything of tissue paper. Here we are face to face with the great problem which bothered mankind for centuries past. To leave the ground with something heavier than air and with a speed of a pretty fast train. And this is only the first start. Some experts will figure the time when we are able to grip the air and measure it with a speed of 200 miles an hour.

It is to be wondered at that no fatal accident took place during the whole week, taking into consideration that at almost every automobile race of one day's duration there have been some fatal accidents. It seems that the air affords more security than the firm ground, and why not?

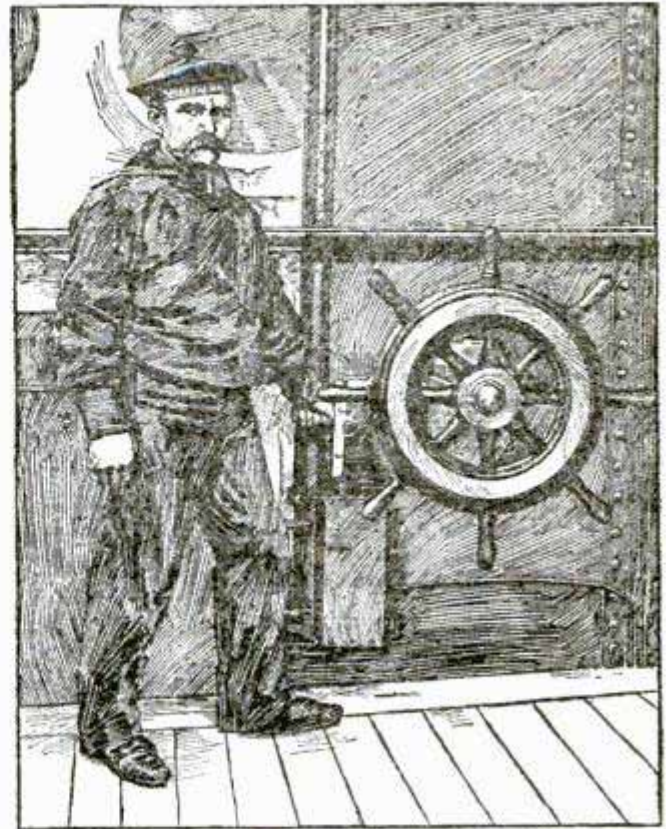
Looking back to the past aerial match we stand all in amazement wondering where we are going to and where all this will end.

But above all we can truly say that man is now completely master of the universe having under his control all the powers, yea, even the kingdom of the air.

Paris, September 1, 1909.

### WATERTIGHT DOOR MECHANISM

All great passenger ships have watertight compartments which are closed the moment a leak occurs from any cause, such a system being one of the most important safeguards if in trouble. The illustration shows a seaman with his hand on the valve which lights red lamps and rings bells in all the watertight compartments of such a ship to



The Wheel That Safeguards a Ship

give warning to the members of the crew. The wheel in front of him, turned once, closes every watertight door in 22 seconds.

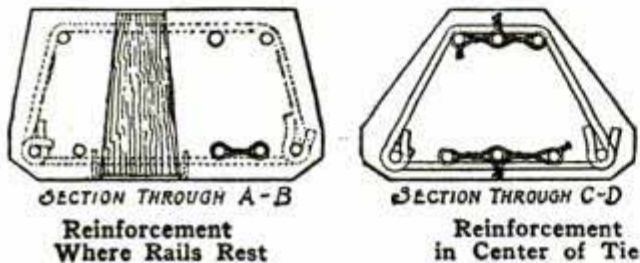
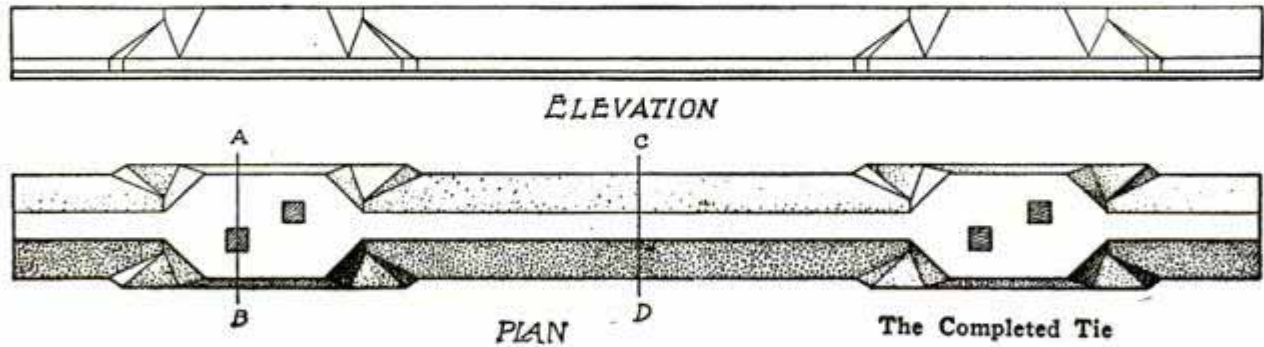
### U. S. DESTROYER MAKES 38 MILES AN HOUR

The U. S. torpedo boat destroyer "Flusser" has proved herself the fastest boat of her size and class in the world. During her standardization trials she made a speed of 38 miles an hour in one instance, and the average of her five top-speed runs was a little over 36 miles an hour. One of the British destroyers has a record of 41½ miles an hour, but she was designed for that speed and is a 1,800-ton vessel, while the "Flusser" has a displacement of only 700 tons and was built for a 32-mile speed.

A change from left-hand running to right-hand running has been made on the western division of the Lake Shore & Michigan Southern, leaving the Chicago & Northwestern railroad practically the only one that adheres to the English practice of running trains left-sided.

## ITALIAN CONCRETE RAILROAD TIES

The Italian state railways commission has recently placed a contract for 300,000 reinforced concrete ties, after several years of successful experiments.



simultaneously. A record of the working of each machine, no matter how distant, is always before the operator. Two wires run to each machine from the keyboard and anyone who can push a key on a typewriter can operate the machines, which will also be useful

to large conventions, railroads, ball parks, theaters, etc.

The cut here shown was made from

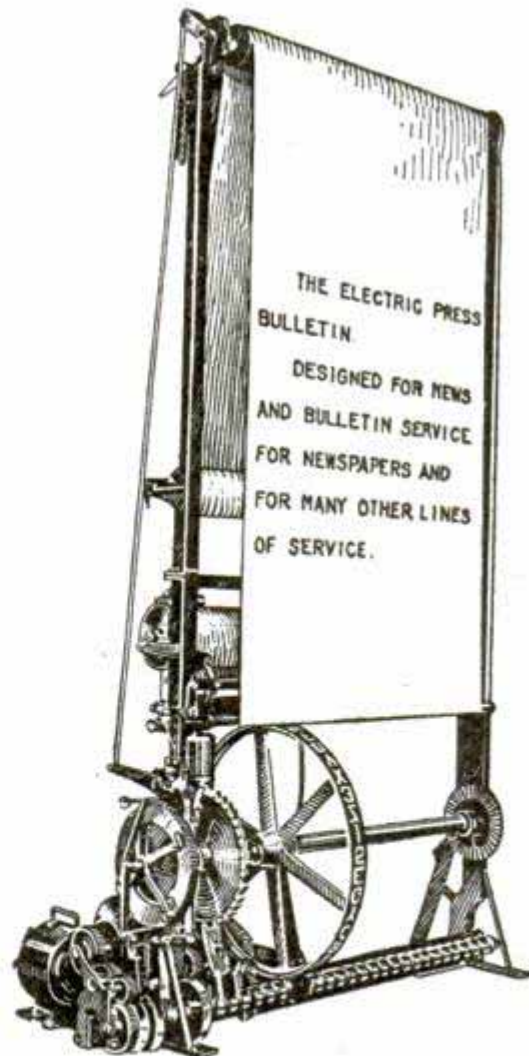
The cost of each tie is about \$1.25, and their life is said to be at least four times that of wooden ties. One tie of every thousand will be tested to destruction and the character of the concrete and its bonding with the reinforcement examined.

The ties are formed as shown by the drawings, weigh about 286 lb. each, of which 28 lb. is reinforcing metal, and are 6 ft. 3 in. long, 1 ft. in width, and 6 in. in height. The method of reinforcing with iron bars is clearly shown.

## AN ELECTRIC PRESS BULLETIN

This new machine, the first of its kind, was designed and built principally for the bulletin service of a newspaper, yet it can be used for many other purposes of a similar nature.

The machine is electrically controlled so that any number of them can be set up miles apart and all connected by wire to a common typewriter keyboard which will cause all of the machines to print the same matter



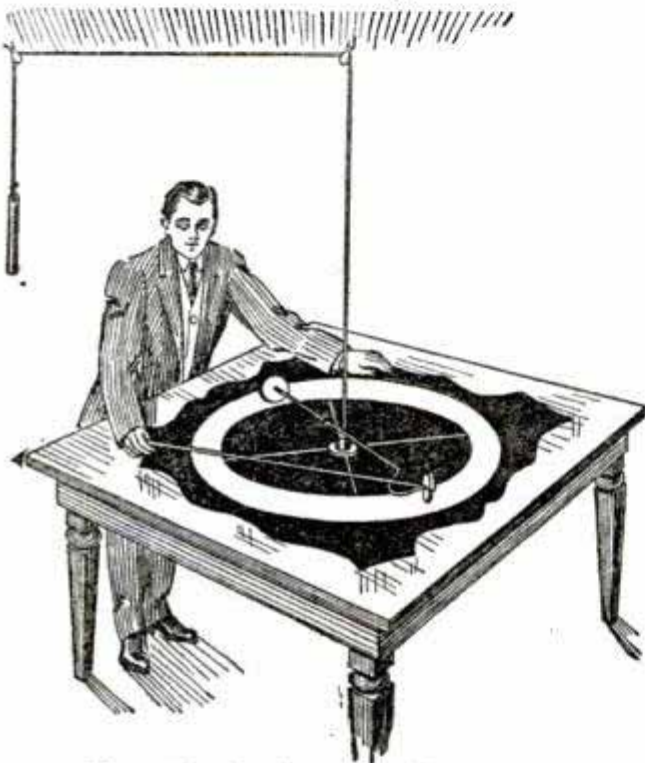
a photograph of the standard size machine for newspaper service. It is 8 ft.



high, prints in letters 2 in. high, and a line 34 in. long and can be made to display a printed bulletin 50 ft. or more in height, if desired.

### RAPID LEATHER-MEASURING DEVICE

A device known as an "areameter" is being used with great success in measuring leather. With this instrument it is claimed that a large hide can be thrown on the measuring table, the ma-



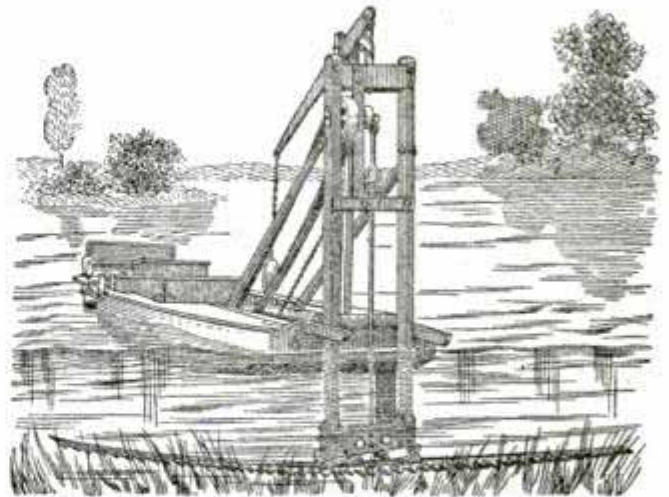
Measuring Leather with New Device

chine adjusted, the measuring accomplished, and another hide placed in position in one minute.

### UNDERWATER MOWING MACHINE

Cutting knives have been fitted to special frames and lowered over the sterns of boats for the purpose of cutting weeds from the bottom of a river, but this is the first machine on record that embodies all the principles of the ordinary mowing machine. It has been used with success in France and Belgium in clearing river and small lake bottoms, and works in a frame that allows it to be lowered or raised to suit the depth. It is driven by the

engine that propels the boat. In this instance it is fitted to the stern of a



Mowing the Bottom of a River

flat-bottomed boat which is propelled or drawn forward by a paddle-wheel of the type usually placed at the stern, and the whole arrangement is driven by a gasoline engine.

### HOW BABIES ARE CARRIED IN INDIA

The conveyance of children is often a serious problem to the parents of any country, and in India it is solved in the manner shown in the illustration. The father of the family carries a crosspiece over his shoulder from which is hung a



A Scale-Like Baby Carriage

couple of trays. In these the babies ride with the greatest comfort and enjoyment.

## PORCH AND LIGHT POSTS OF SHEET METAL

Sheet metal as a material for porch columns, building supports, and ornamental street lighting standards is a somewhat new departure, it being claimed that the company now manu-

facturing them is the first to successfully do so. Patents cover the manufacture of such columns made of any kind of sheet metal tapered from its base and fluted, as well as the machines which make possible the use of such metal. The ornamental street lighting standards are made of pressed steel, pressed copper or pressed bronze.

It is possible to turn out columns as great as 40 ft. in length and 40 in. in diameter. Such columns, it is claimed, have several times the strength of wood, will last three times as long, and sell at approximately the same price. Weight is also a consideration, being prac-

tically nothing as compared to stone columns.

The illustration shows a porch column 11 ft. long and 14 in. in diameter at the base of the shaft. Some idea of the cost of such columns may be gained by the fact that this column would cost \$20, which is slightly less than \$2 per lineal foot.

## LINCOLN CENT ADDS TO TELEPHONE RECEIPTS

As the result of a news item published in a Columbus, Ohio, newspaper, the telephone company received a large amount of extra toll for a couple of weeks in Lincoln cents. The

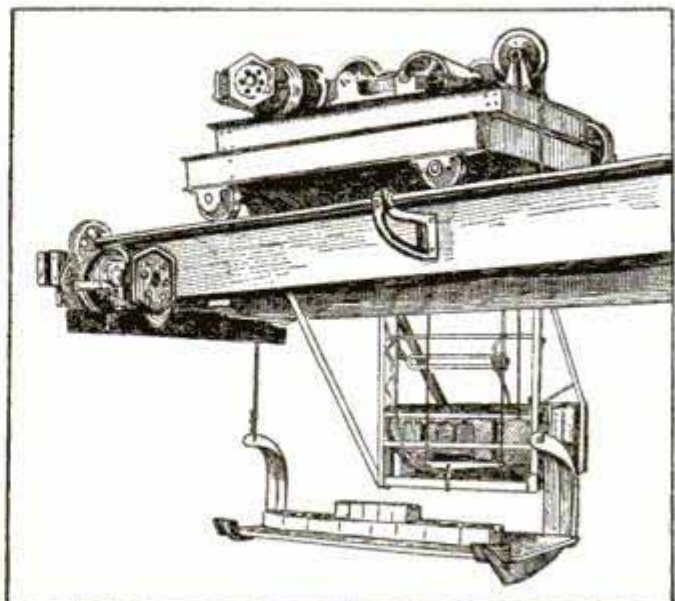
item in question informed the public that the new cent would work the telephone slots, and as a result the telephone company, when next it opened its toll instruments, reaped a harvest of considerable value. The new coin, being only a shade thicker than the old cent, slipped through the slots but failed to work the machine, and every one used for the purpose meant revenue for the company.

Telephone slots in many cities return the coin if not of the right size, but in communities where instruments of less hospitable tendencies are in use many people were losers.

## ELECTRIC WEIGHING CRANE

An electric factory crane that not only lifts but weighs a load, thereby combining two necessary operations in one, has been designed and placed on the market. The scale beams are in the cage suspended from the trolley, and readings can be quickly taken and recorded by the operator. A simple movement of a hand lever transfers, when desired, all load from the knife edges of the scale to the frame of the trolley truck, and then the operation is the same as with an ordinary trolley.

The ordinary method of crane weighing consists of hanging a scale device



Combination Crane and Scale

on the hook, and requires an extra man to read, enter and calculate the weights.



Safe Blown by Nitro-Glycerin

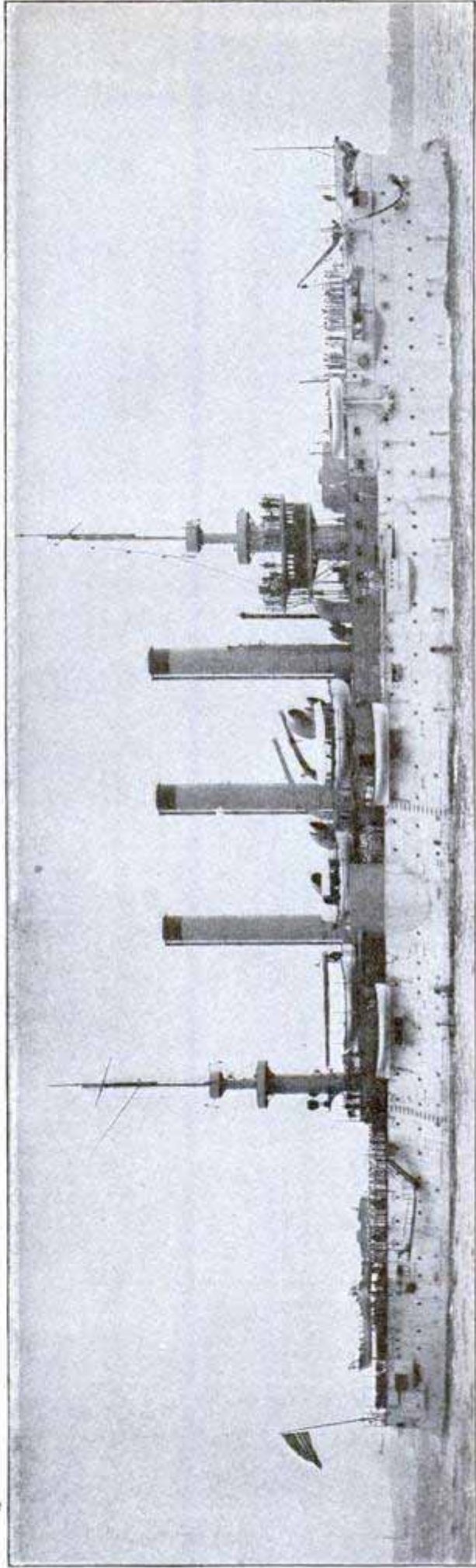
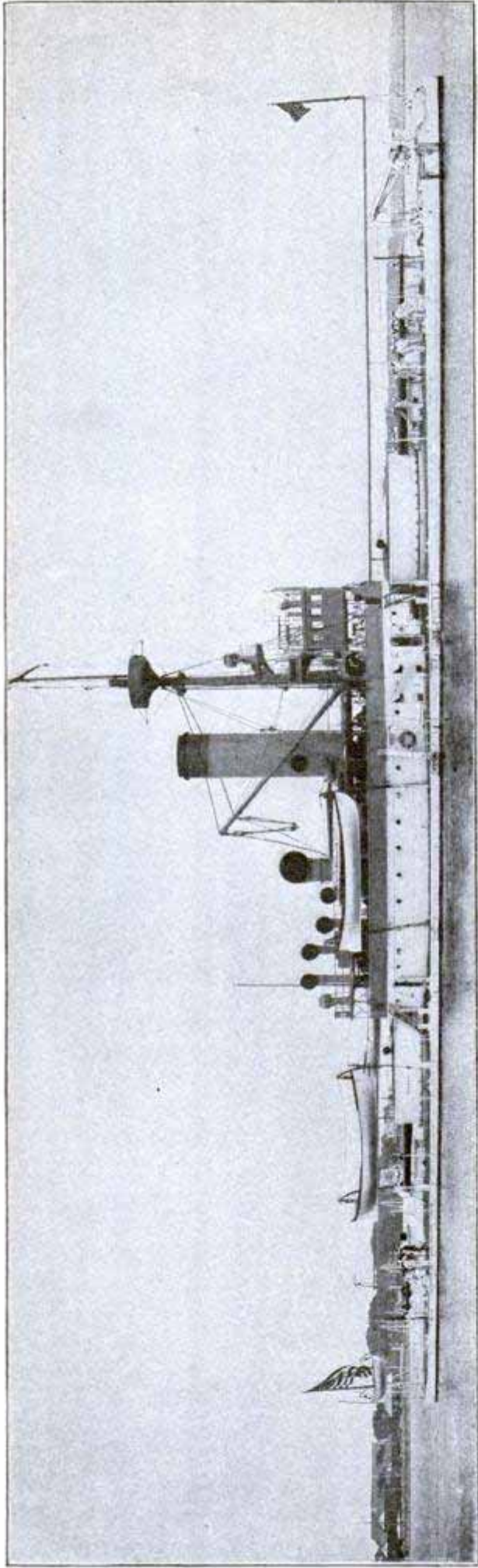
### SAFE WRECKED BY YEGGMEN

The accompanying illustration shows the appearance of a safe after it had been "blown" by yeggmen in the post-office at River Rouge, Mich. Nitro-glycerin was used. The broken material scattered over the floor was the inner filling of the door.

A horse fly, entering the carburetor of an automobile through the air intake, resulted in several hours' delay while the chauffeur was trying to determine where the trouble was.

### BUTTERFLIES INTERFERE WITH AUTOMOBILING

One of the greatest enemies the few automobiles in Ceylon, a British island in the Indian ocean, have to contend with is butterflies which, swarming in untold millions, settle along the road in damp places, and when a car passes are killed by thousands. This forms a slippery layer that makes running difficult, and, should the automobile happen to be air-cooled, the air is often shut off by the butterflies covering the front of the hood.



Copyright, 1905, by E. Muller

The "Terror" and the "Brooklyn," to be Used as Targets for Greater Ships

## ONCE MIGHTY WARSHIPS AS TARGETS

Seven fighting ships of the U. S. Navy, only a few years ago considered great and looked upon as the pride and glory of the American nation, lie idly awash at the Philadelphia navy yard awaiting the call that will mean their destruction, either as targets for the greater ships that have taken their places, or as scrap iron.

These ships, which cost the United States more than \$15,000,000 to build, are the "Brooklyn", "Columbia", and "Minneapolis", of the cruiser class; the "Terror", "Miantonomah" and the "Amphitrite" of the double-turreted, low-freeboard monitor class, and the "Katahdin", a ram which never fired a shot from the time of its completion.

Of these, the "Brooklyn", launched in 1895, is the most famous. Her heavy steel metal and guns helped to break the power of Spain at the battle of Santiago. The three boats of the monitor class were built on the same principle as the first famous "Monitor" which sunk the "Merrimac" during the Civil war, and were practically antiquated before their launching.

The ram "Katahdin" was authorized in 1882 and at that time the ramming idea was much in favor, many experts believing that such a vessel could escape the fire of the enemy and send them to the bottom with their rams. At that time the armor was stronger than the guns and the idea seemed correct, but the Katahdin, although her authorized speed was close to 18 miles an hour, never made more than 12 or 13 miles.

Nothing is the matter with any of these ships, except that they are out of date. They are of an antiquated and ancient pattern, and the best they can now demand of fate is the opportunity of adding to the efficiency of the present gunners by presenting their broadsides to the shots of a younger generation of mighty ships.

The "Brooklyn" and "Terror" are shown in the accompanying illustrations.

## TANKARD THAT SOLD FOR \$187,500

A wonderful tankard of Gothic style, made in 1477 and held ever since that time by the town of Goslar, Germany,



Courtesy the Keystone

This Tankard Represents a Fortune

has been sold by that community to the Royal Museums at Berlin for the stupendous price of \$187,500. The wonderful piece of work was made in the

15th century for the mining association of Goslar. The body, as shown in the illustration, is in the form of diagonally twisted bosses, separated by a deep recess, with a second narrowing at the neck. Above the depression in the body is a wreath of foliage of the most beautiful workmanship, with half figures of angels with musical instruments. The upper edge, foot, and lid are ornamented with scroll work, while the dome bears in small figures a rep-

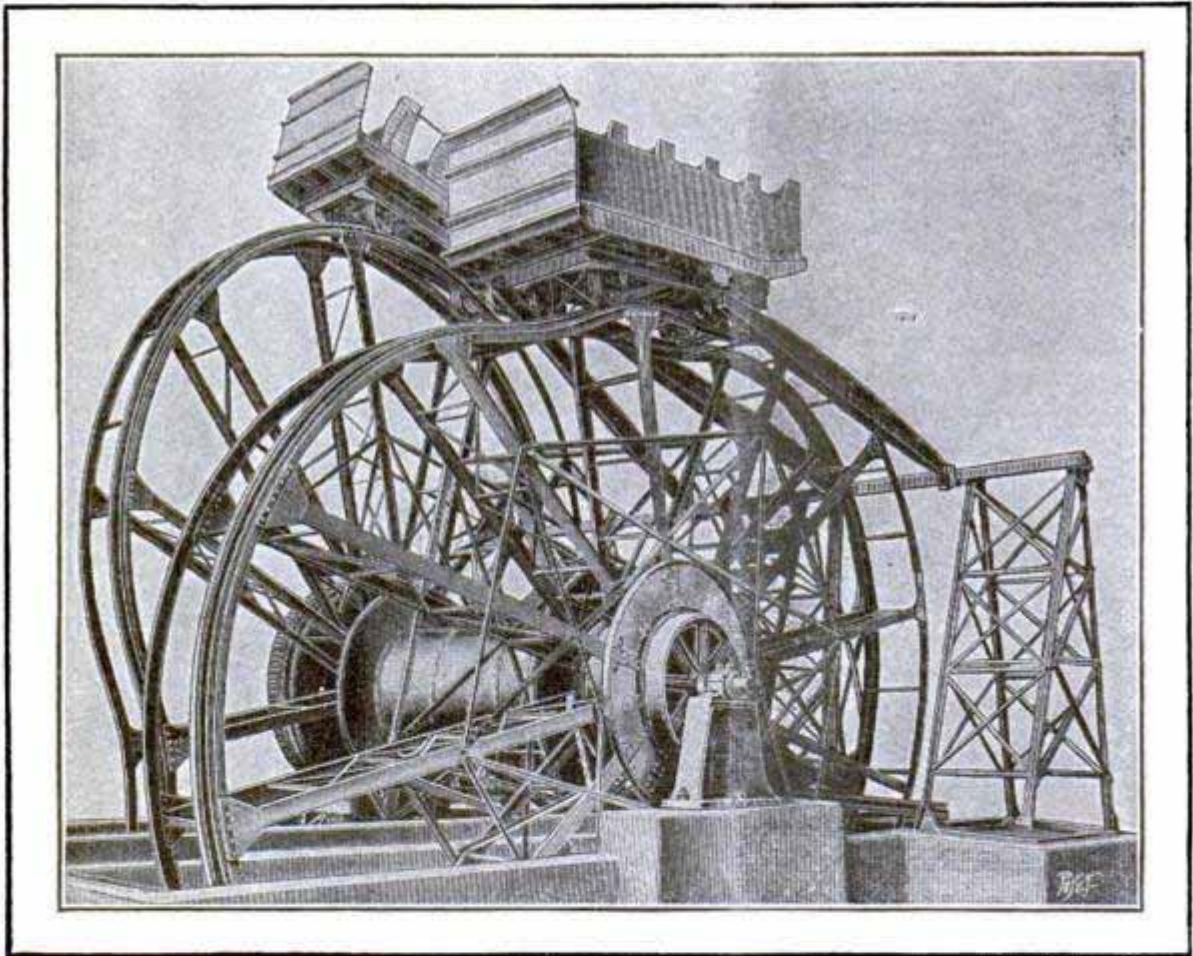
resentation of mining in the Rammelsberg, the silver output of which was the city's source of wealth.

The authorities of Goslar were influenced in selling the tankard by the fact that the high price could not be refused in justice to the tax-laden community, and because very few people ever saw it there and it was but little appreciated locally. As early as 1777 it was in danger of being minted into coins because of a shortage in city funds.

## DIABOLICAL AMUSEMENT COASTER

The amusement coaster shown in this illustration is especially interesting because of its diabolical air accessories and the fact that, unlike the majority of such devices, the cars stand still

the changing unevenness of the tracks under them as the wheels whirl give them many and curious motions. During the ride, powerful currents of air, generated by machines, are directed



Roller Coaster with Revolving Tracks

Courtesy La Nature

while the tracks, in the form of misshapen wheels, are made to revolve by an electric motor. The cars are attached to long arms that hold them stationary, as far as backward or forward progression is concerned, while

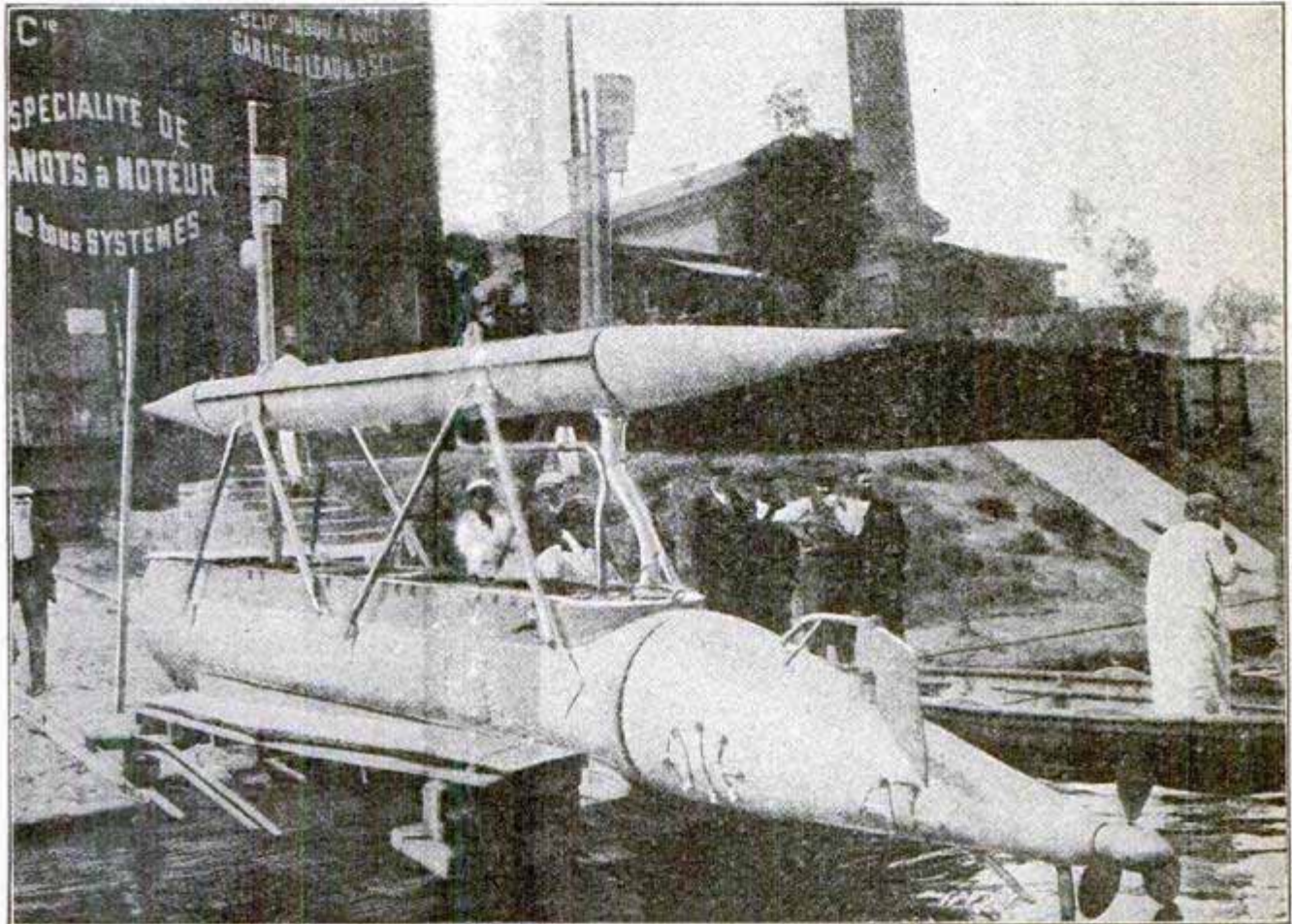
from many unexpected quarters against the persons riding, with results very laughable.

The output of pig iron in 1908 was 15,936,018 long tons.

## A TORPEDO CONTROLLED BY WIRELESS

The curious looking craft shown in this illustration is a French wireless-controlled torpedo. It is driven by a 30-hp. engine, and contains about 1,000

that the place of parting was on a street car, and he had placed the identification mark provided by the railway company upon it.



Courtesy Motor Boat, London

Motor-Driven Wireless-Controlled Torpedo

lb. of gun cotton. The long cylinder above the main body contains the gasoline supply, and the two short spars that rise above it contain the wireless apparatus by which the controlling waves of electricity are received.

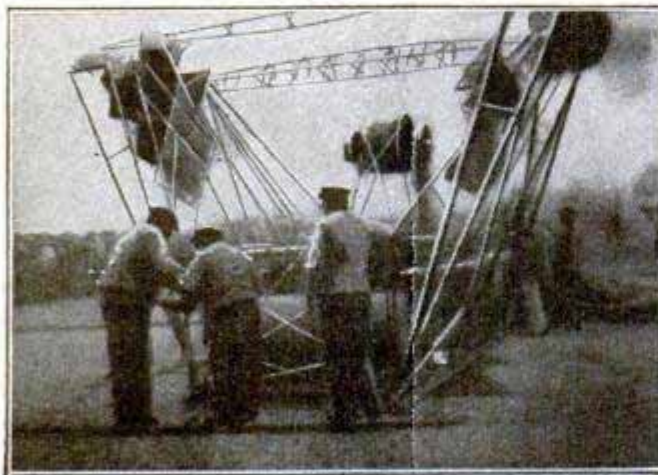
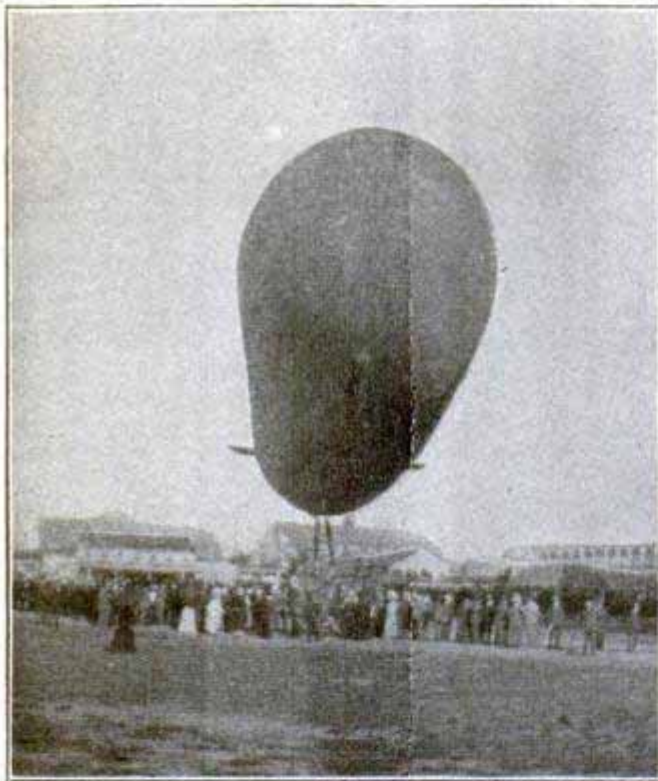
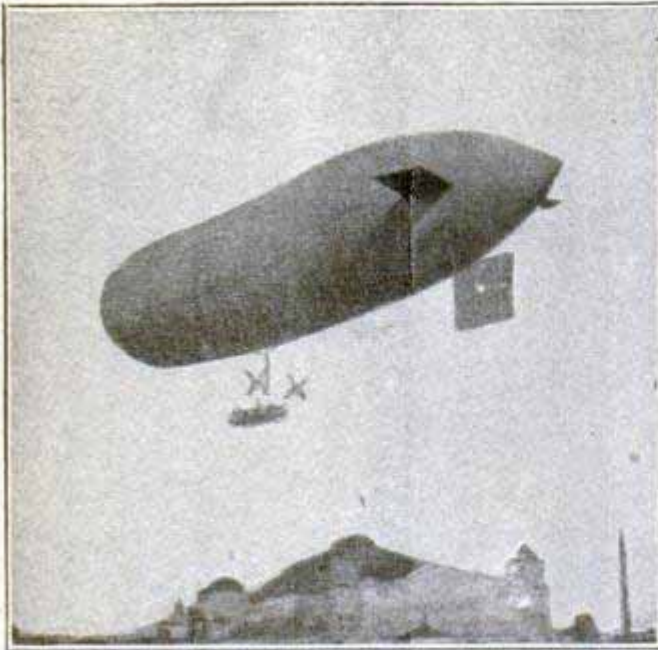
### RETURNING ARTICLES LOST ON STREET CARS

The street railways system of Berlin, Germany, is considering a lost-article system by which umbrellas, canes, and the like, left on the cars, may be returned to their owners without need of identification. The system, if adopted, will have many beneficial features. A person losing such an article very seldom knows just where he left it, nor need he, if it has happened

This identification mark is a small paster, marked with a specific number, easily attached to inconspicuous parts of the article. The company, of course, keeps a record of the names and addresses of persons to whom one or several numbers have been assigned, and when an article is found bearing one of the numbers it is returned to the owner's home, the latter bearing the expense of the returning.

The importance of the scheme may be estimated from the fact that 36,000 umbrellas were left in Berlin cars last year.

It is estimated that there are now about 1,000 flying-machines in the world already completed, about 200 of which are in the United States.



The "Parseval" in Full Flight—Hovering Above the Ground—After the Fire-Hall Accident

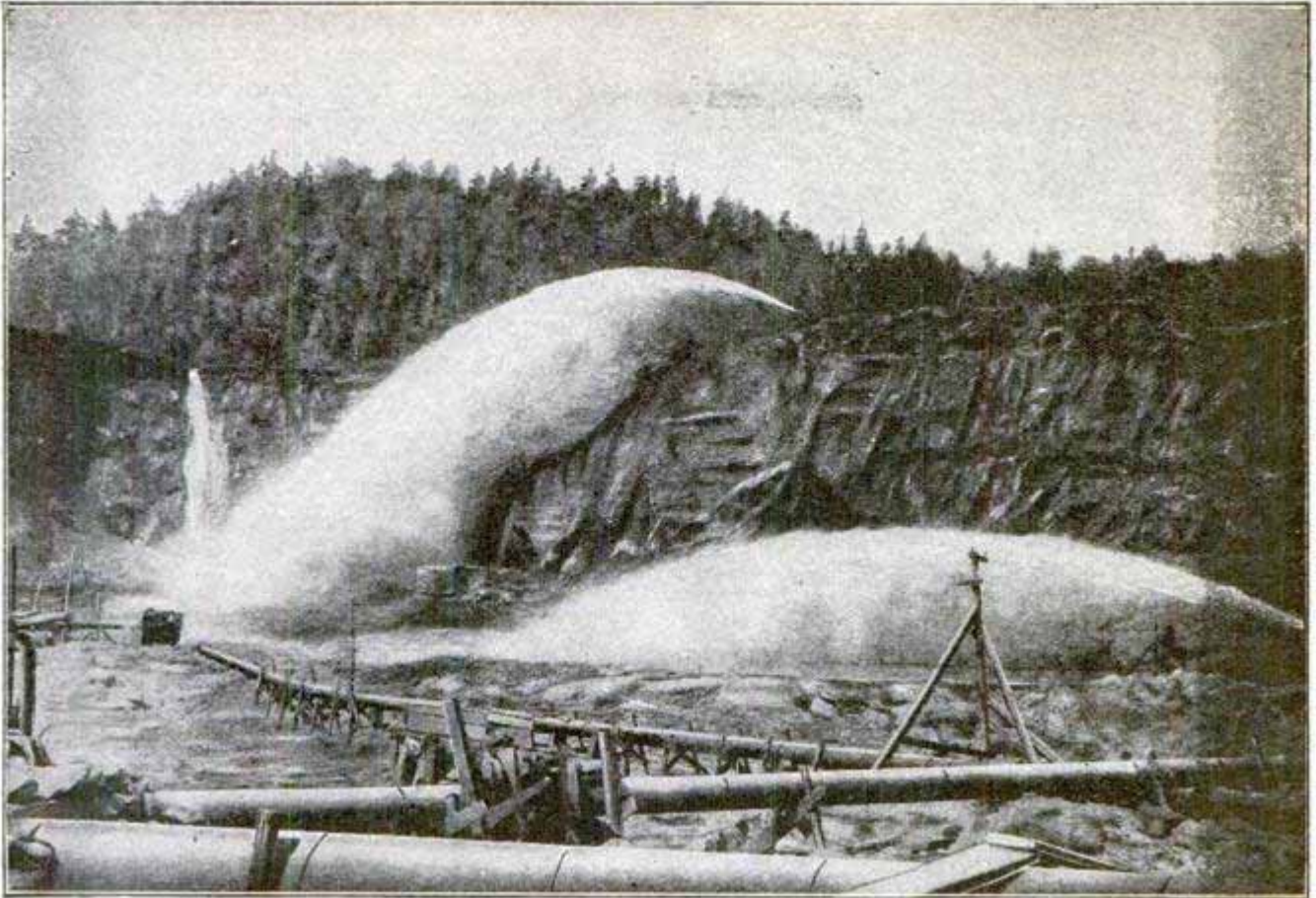
## PARSEVAL DIRIGIBLE AIRSHIP WRECKED ON FIRE STATION

The Parseval balloon, the closest rival of the Zeppelin type in Germany, ended a series of successful flights at the Frankfort exhibition in August by being partially wrecked on the roof of a fire station in a suburb of the German city. The balloon left the exhibition grounds with seven passengers and a crew of four, making 11 persons in all, and on the return journey attempted to make a detour around the city. The wind increased in velocity, however, and as all the ballast had been cast overboard, a sufficient altitude could not be reached to pass over the roofs of the buildings in one of the suburbs. After the car had demolished several chimneys and just missed being itself wrecked, the pilot decided to attempt a landing in one of the wider streets. This maneuver was unsuccessful, the balloon striking the building on one side of the street and then, when her engines were reversed, skidding across to the other side again. She finally landed on and considerably damaged the roof of a fire engine station, but the car landed safely on the pavement and the passengers and crew escaped. The gas bag of the craft was badly torn, allowing the gas to escape.

## TEARING WEALTH OUT OF THE EARTH

Covering an area of 2,450 acres, as it does, the largest hydraulic gold mine in the world is to be found in Trinity county, California. Oregon mountain is the scene of operations. To thrust great holes into the vitals of a mountain, rending and tearing away by the hundreds of tons the earth and gravel and huge boulders in order that the precious metal hidden away therein might be secured requires a tremendous head of water. There was none available in the immediate vicinity, and a pipe-line 29 miles in length had to be constructed. Part of this line is through a tunnel in the side of a mountain—a mile and a half in length, which





"The Water Bursts from the Nozzle in a Solid, Cylindrical Stream"

took two years to build. On top of Oregon mountain is a huge reservoir, in which this precious water is stored. Through an 8-in. nozzle, 3,000 cu. ft. of water may be discharged in the space of a minute, with the velocity of 180 ft. per second.

The water bursts from the nozzle in a solid, cylindrical stream, and strikes against the wall which is to be torn down with a tremendous impact. Great rents begin to appear in the face of the mountain, stones and boulders, the latter often of enormous size are tossed aside and rolled and turned like pebbles in a mill-stream. A torrent carrying this whirling mass presently is rushing past. The crushed disintegrating burden is carried through races and sluices prepared to receive it. About 9,000 cu. yd. is thus carried off in every twenty-four hours.

Should a human being ever get in front of one of those terrible nozzles, his fate would as surely be sealed as if he had run into a battery of discharging cannons. Sometimes, though rarely, one of these terrible mountain-

tearers gets beyond control, whipping and swaying from side to side, and it takes considerable ingenuity and more nerve even to bring the terrible monster under control.

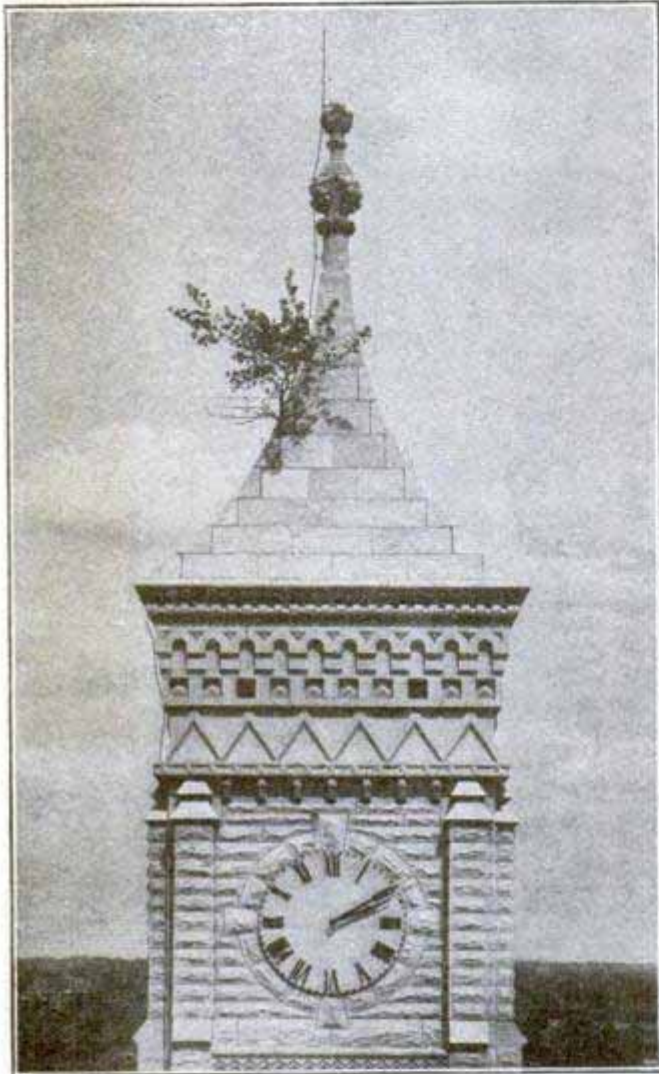
Once a month the sluices are permitted to be empty of water. Then it is that the golden harvest is gathered. From fifteen to forty thousand dollars worth of the precious metal is invariably found to be deposited, the heavy substance, of far greater weight than gravel or stone, sinking to the bottom.

This hydraulic mine is situated 50 miles from a railroad. The expense of transporting machinery, supplies, and equipment thither was enormous, yet the net returns are such as amply to justify the original outlay.

This big-scale mining, reminding one almost of "trust methods" of operating, is in sharp contrast with the old-time system of washing out the ore by diverting a small stream into a cavity and then catching the few particles that finally emerged, when the stream once more reappeared.

### TREE GROWS ON TOWER

Greenburg, Ind., boasts of a remarkable curiosity—a tree-bearing court-



An Unusual Roof Garden

house tower. About 20 years ago a maple seed, carried by the wind or dropped by some bird, lodged in a

crevice of the tower. The seed sprouted and, surviving the dangers of its precarious position, developed into a sturdy maple that is now 10 or 12 ft. in height.

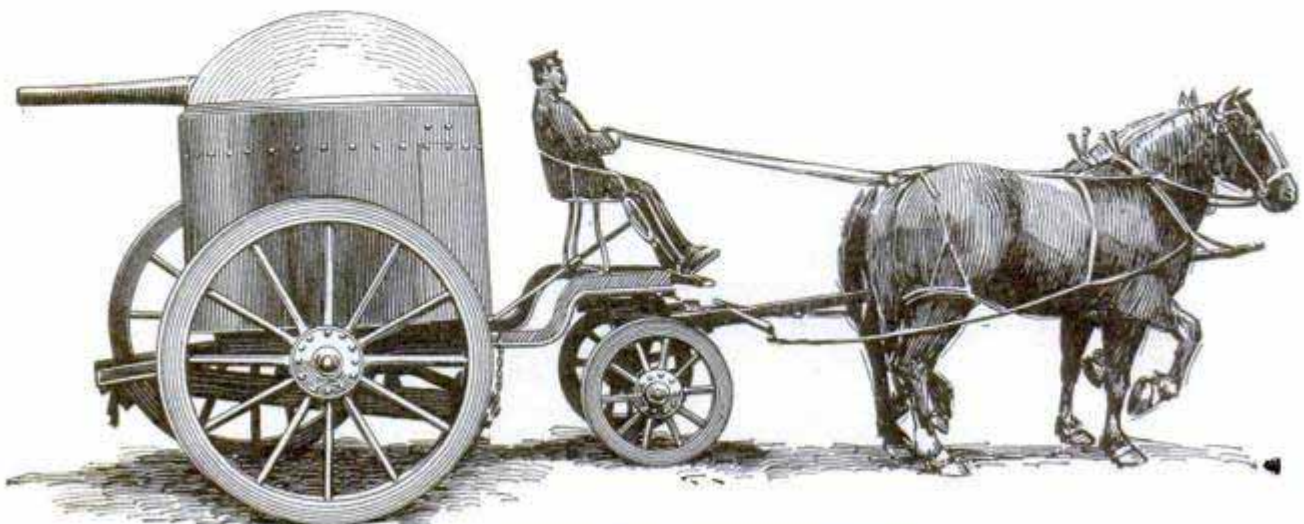
### DESTROYING AN ICEBERG

A successful attempt to rid Cuckhold's Cove, where the ends of the new commercial cable at Newfoundland are being landed, of a great iceberg resulted in many narrow escapes. Gun-cotton was first tried without effect, and then dynamite was resorted to. To place this charge, a number of men had clambered onto the iceberg when the monster lost its balance under their weight and began to topple toward the water. Several men jumped and were picked up by a cable-ship's launch, while those remaining on the berg had a marvelous escape, as it ceased its downward roll just as the part on which they were standing reached the water's edge, a new balance having apparently been created.

Finally the cable-ship took the berg in tow and dragged it out to sea.

### MOVABLE GUN AND BARBETTE

This gun, with its barbette not unlike that of the big guns of a warship, is one of the latest ideas of the famous Krupp experts for fort defense. It can be moved about, by means of special cart and horses, to any point around a fort where it may be required.



Armored Guns Wheeled from Place to Place

## CONDENSED NEWSPAPER FOR HOSPITALS

A novel feature in the care of patients was recently adopted by the California hospital in Los Angeles. It consists of a condensed daily newspaper containing a résumé of all the news of the day taken from the morning newspapers. The news is divided under three heads—foreign, domestic, and local, and is read to the nurses while they are at luncheon. The nurses then impart as much of it as they believe interesting and not harmful to the patients under their charge.

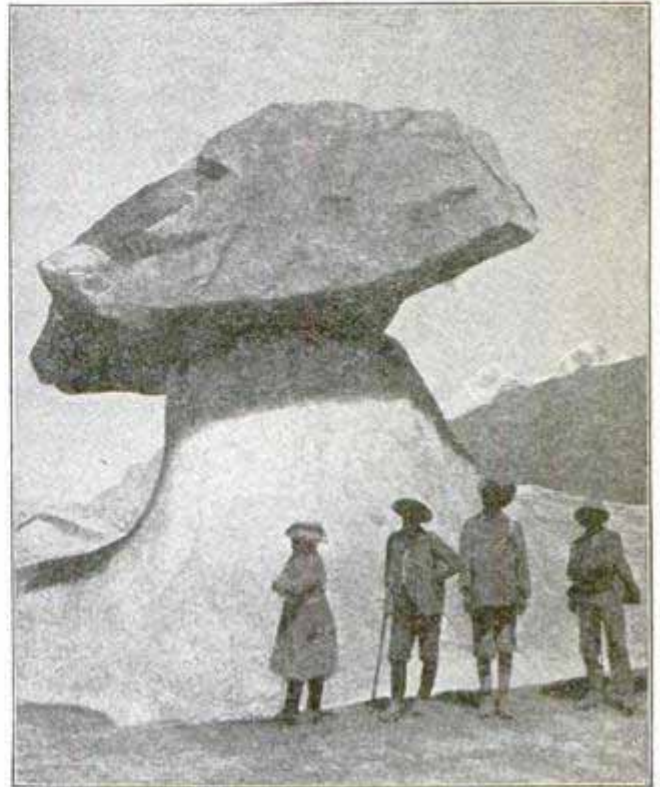
## SEARCHLIGHT SHELLS FOR WARFARE

A new illuminating shell, fired from the ordinary big guns of field artillery, coast defense forts, and ships, have proved so successful in recent tests that France is having them manufactured in large quantities for warfare on land and sea. The new projectile is a French invention that bursts into flame in the air and acts as a temporary searchlight, revealing the position of the enemy's army or battle fleet for a sufficient period for the gunners to get the range. The illuminating shells can be projected as great a distance as an ordinary shell, and will illuminate positions several miles distant.

Germany also has an illuminating shell, but this is considered inferior to the French invention, because it is loaded with calcium carbide and only bursts into flame when it falls into the sea.

## GRANITE BOULDER ON ICE PEDESTAL

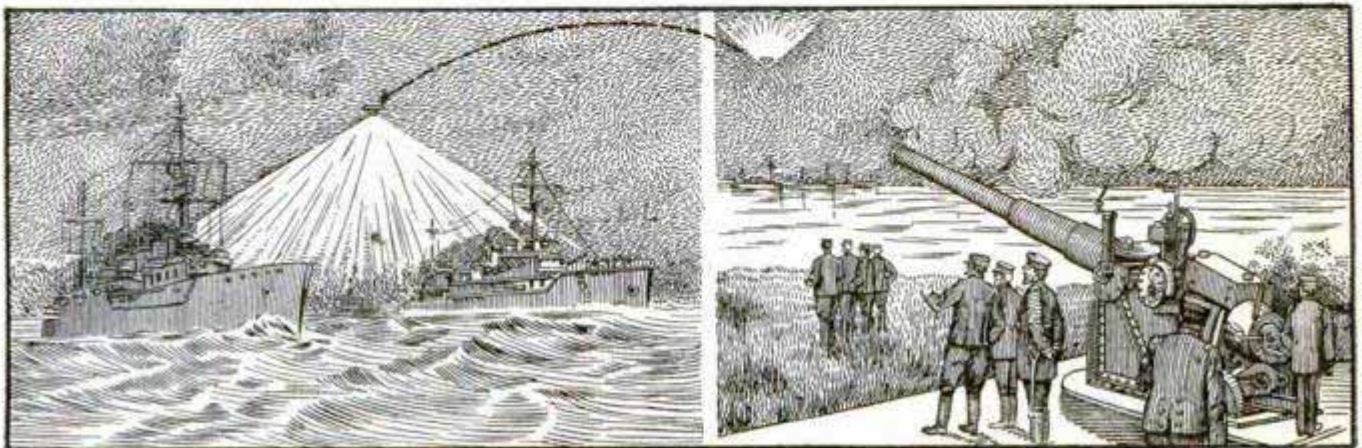
Mrs. Bullock Workman and Dr. Hunter Workman, famous pioneers in



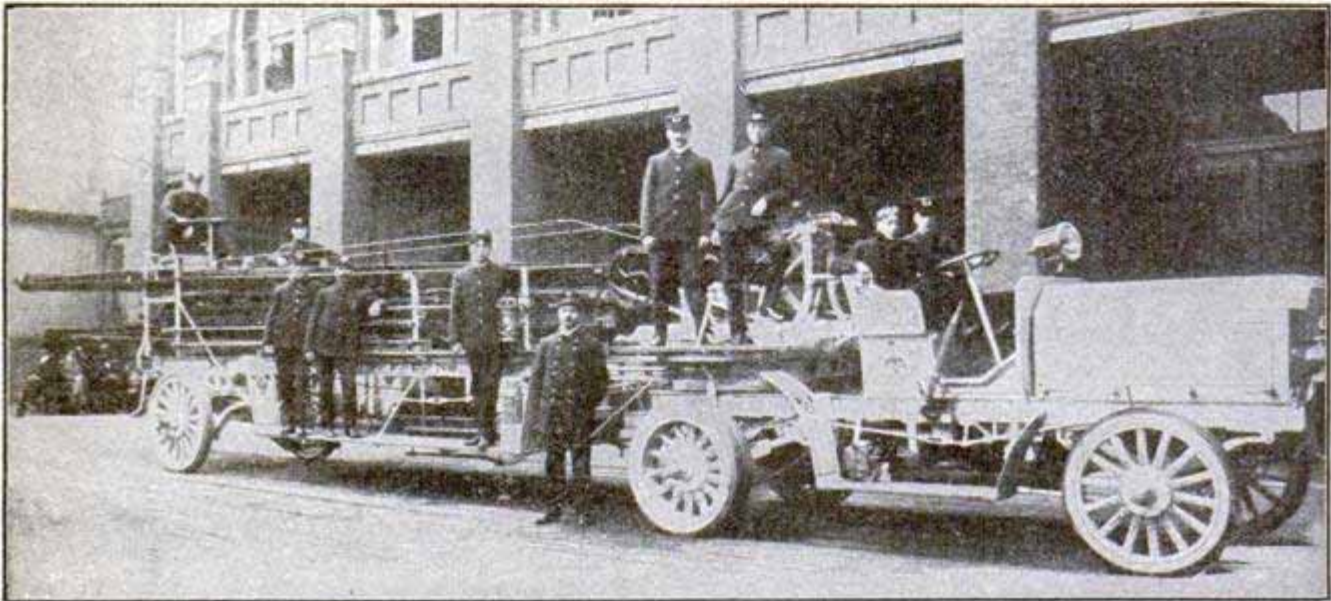
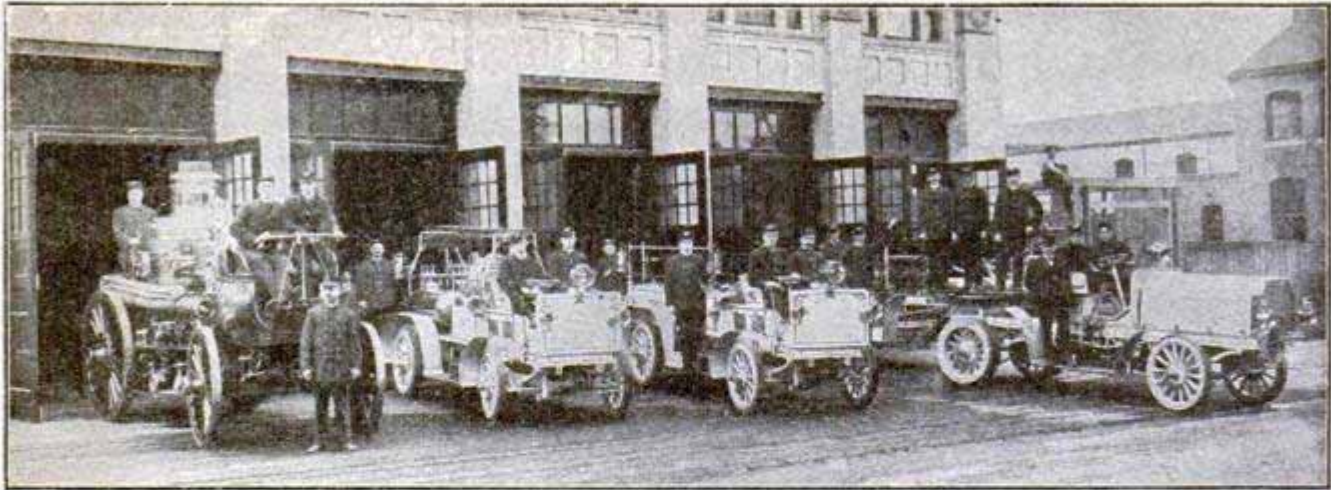
Courtesy London Illus. News

### On the Roof of the World

mountain climbing, hold the world's record for high ascents through an expedition in the Himalayas in which they reached an altitude of 23,394 ft. The illustration shows them on a hitherto untrod peak of the famous watershed between the Hispar and Biafo glaciers of the Himalayas. Forming the background of the photograph is a giant granite boulder on a 12-ft. pedestal of ice. It has probably been in this position for ages.



New Projectile Bursts into Flame in the Air



A Vancouver Auto Fire Brigade—Huge Auto Ladder Truck

## VANCOUVER'S AUTO FIRE APPARATUS

Vancouver, British Columbia, can well be called the city of auto fire apparatus, as it has an equipment of this nature that is equal to that of any city in the world. Five or six of its stations are completely equipped, the auto brigade of station No. 1, consisting of auto fire engine, chemical auto, hose auto, and an auto ladder truck, being shown in one of the illustrations.

The auto ladder truck, which is one of the largest machines of the kind ever constructed, is also shown in a separate illustration. It is a huge affair with three sets of wheels, the after wheel-truck of the automobile proper forming the forward truck of the portion on which the ladders are stacked. Both the forward and rear set of wheels are equipped with steering gear. A

huge stationary ladder surmounts the stack of smaller ladders.

### DID AS HE WAS TOLD

Some years ago the Yankee schooner "Sally Ann," under command of Capt. Spooner, was beating up the Connecticut River. Mr. Comstock, the mate, was at his station forward. According to his notion of things the schooner was getting a "leetle" too near certain mud flats which lay along the larboard shore, so aft he went to the captain and, with his hat cocked on one side, said: "Cap'n Spooner, you're getting a leetle too close to them flats. Hadn't ye better go about?"

The captain glared at him.

"Mr. Comstock, jest you go for'ard

and tend to your part of the skuner. I'll tend to mine."

Mr. Comstock went for'ard in high dudgeon.

"Boys," he bellowed out, "see that ar mud hook's all clear for lettin' go!"

"Ay, ay, sir!"

"Let go, then!" he roared.

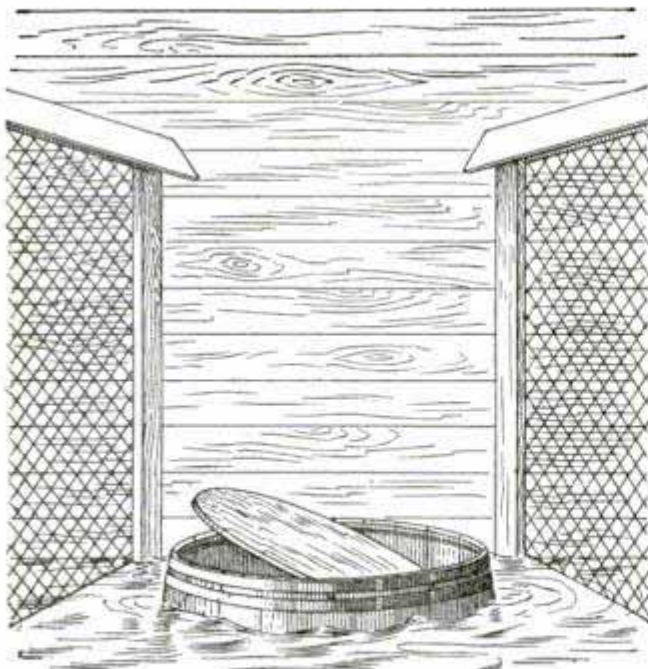
Down went the anchor, out rattled the chains, and like a flash "Sally Ann" came luffing into the wind, and then brought up all standing. Mr. Comstock walked aft and touched his hat.

"Well, cap'n, my part of the skuner is to anchor."—Bluejacket.

### CATCHING RATS UNDER WHARVES

Rat traps of the barrel type, described in a recent article of this magazine, are now being used in the cities of the Pacific coast to catch the rodents that frequent the wharves. In Seattle the traps take the form of wire corrals, protected at the top with tin flanges protruding downward to keep the rodents from climbing over. Barrels are sunk in the sand in these corrals, and the rodents, running over the balanced tops, tip them up and fall through.

The device is expected to capture a

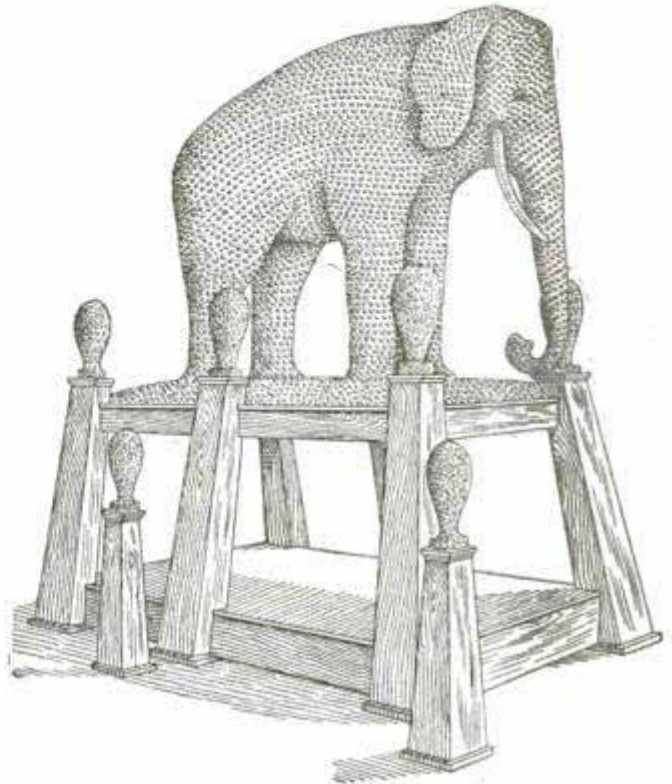


Modern Use of Barrel Rodent Traps

large number of the rats that travel under the wharves, especially on tide flats.

### AN ELEPHANT MADE OF WALNUTS

One of the most curious and unique menageries of animals at the Alaska-

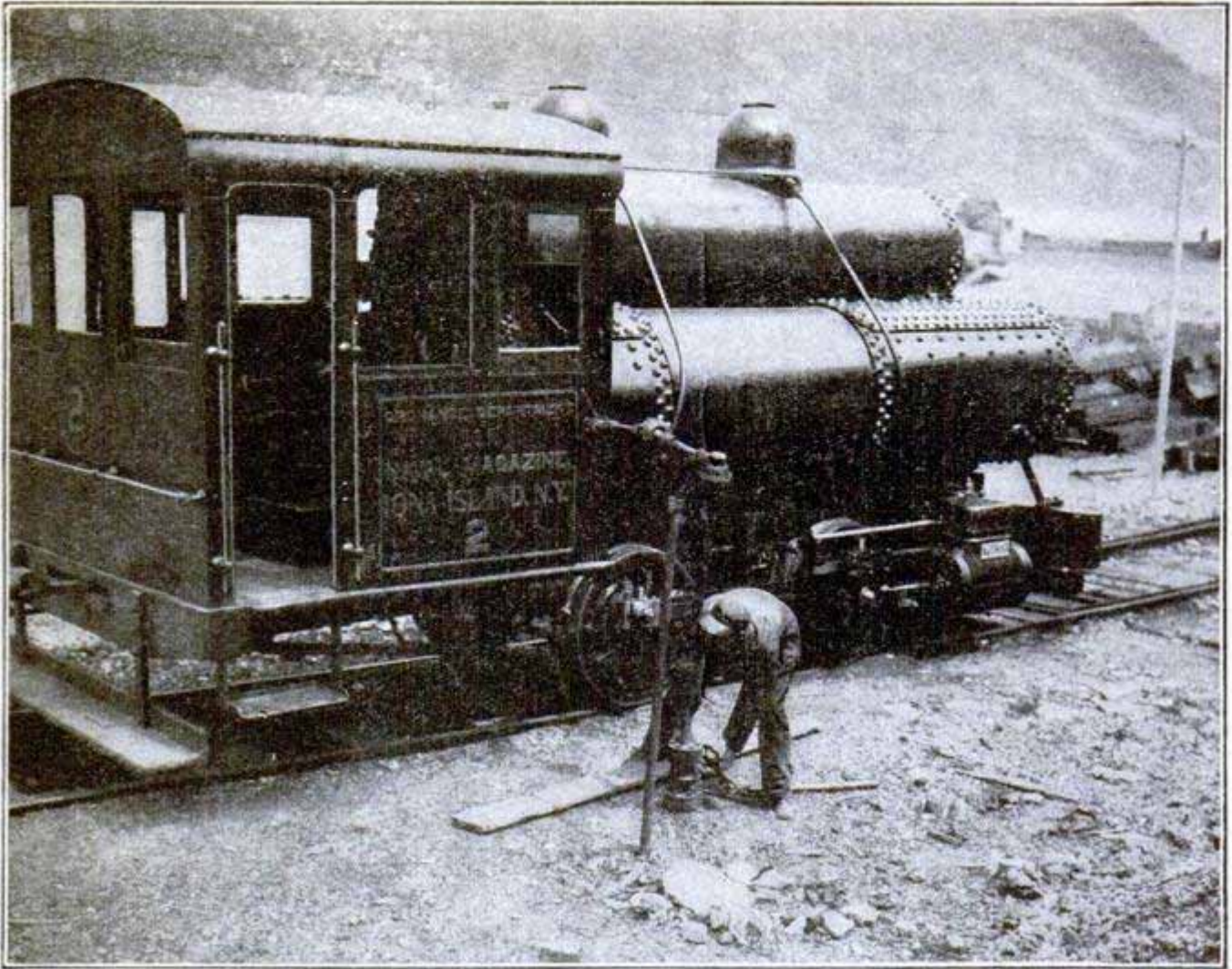


Walnut Elephant

Yukon-Pacific Exposition was seen in the Californian building in the shape of a bear, an elephant, and a cow made respectively of raisins, walnuts, and almonds. The illustration shows the English walnut elephant. The purpose of this curious exhibition was to draw attention to three of the staple products of the state.

### CREOSOTING TIES WITH WOOD TAR

The Swedish state railways commenced experimenting with wood tar creosote instead of coal tar creosote for the treatment of ties, but the substitution has proved unsatisfactory. It was difficult to get the wood tar to penetrate deep enough into the wood, not more than 12 lb. to the tie being absorbed, as compared with 20 lb. of coal tar creosote. There is a possibility, however, that the 12 lb. of wood creosote may provide the same resisting power as 20 lb. of coal tar.



Feeding Compressed Air to "Sparkless" Locomotive

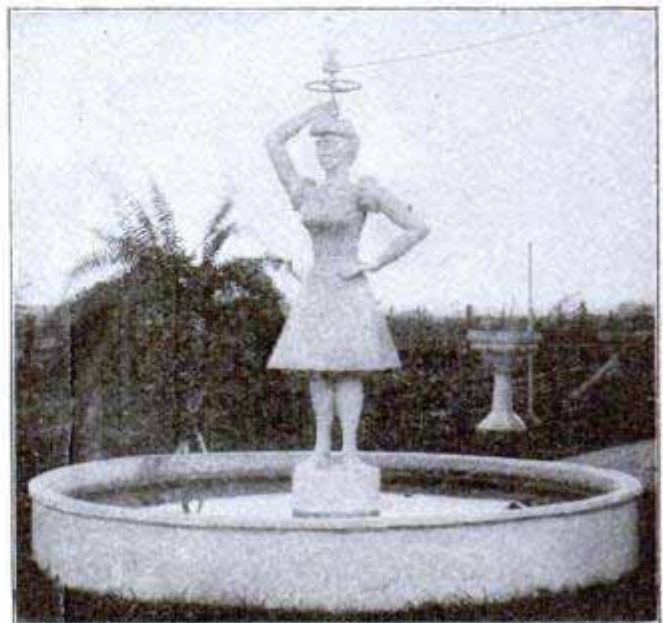
### COMPRESSED AIR LOCOMOTIVE HAULS POWDER

Owing to the fact that fire is a dangerous element when used close to powder, the cars containing powder and loaded shells for the battleships at the Iona Island naval magazine on the Hudson, are drawn by the "sparkless" engine shown in the illustration. It is driven by compressed air, and when the photograph was taken was receiving a fresh supply from the piping system.

### CONCRETE STATUE OF BATHING GIRL

The concrete fountain shown in this illustration is part of the lawn display of the head carpenter of a mine at Lovington, Ill. The figure in the center is his reproduction of Charles Dana Gibson's "Bathing Girl." In making this figure he first cut out a model of

wood and constructed the molds from it. Pipes for the water supply pass through the figure and connect with the spray held upon the head. An electric light above the spray illuminates the fountain at night.



The Model Was Cut from Wood

## SANITARY DRINKING DEVICE

A common fault of ordinary sanitary drinking fountains is the waste of water, but a drinking device of this kind is claimed to save most of this, and, although only running when in use, it is likewise claimed to be impossible to get a drink from it before the mouthpiece is thoroughly cleansed.

It is attached to a water pipe in the same manner that a faucet is attached flush to the wall. When a drink is wanted, the lever is pushed upward and the mouthpiece forward on a line with the drinker's mouth. The water spouts up gently with a sufficient scouring action to cleanse the mouthpiece and in a stream sufficiently great to obviate the necessity of touching it with the lips. In this it embodies the principle of the flowing cups which are frequently found on street fountains, with the added advantage that the water is running only when a person



Fountain Drinking Tube

is drinking. When the lever is let go the water is automatically shut off.

## EASTERN LUMBERMAN KILLED IN AUTO ACCIDENT

George Van Dyke, president of the Connecticut Valley Lumber Company and probably the best known lumberman east of Pittsburg, was killed recently in an automobile accident which occurred while he was watching a log drive on the Connecticut river at Turner's Falls, Mass.



Fatal 75-ft. Fall of Automobile

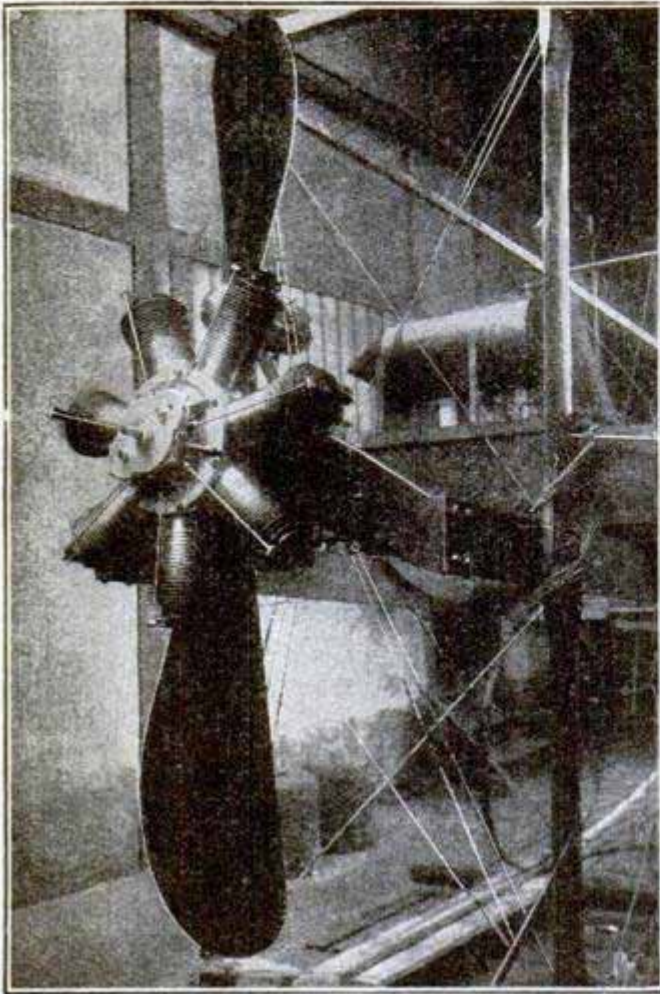
The log drive down this river is hailed as one of the greatest events of the year by all who live near its banks. The great number of falls and rapids make the task one that cannot be accomplished without the aid of dynamite, consequently a small army of log jammers are brought down for the event and fêted as the chief performers in what, to the majority of onlookers, is nothing more or less than a huge and spectacular entertainment for their amusement.

It was such a scene as this that Van Dyke was superintending in his automobile, rushing from one point of the river to another. Opposite Turner's Falls, where there is a bluff about 75 ft. high, he requested his chauffeur to approach the edge so that he could watch the drive at that point. The machine stood near the edge until he was ready to ride to another point. When the order was given to start again, the chauffeur worked the wrong levers, either backing when he should have gone ahead, or the reverse, and the machine shot over the embankment to the rocky channel wall of the river. Both Van Dyke and the chauffeur died shortly after.

The illustration shows the machine and where it struck.

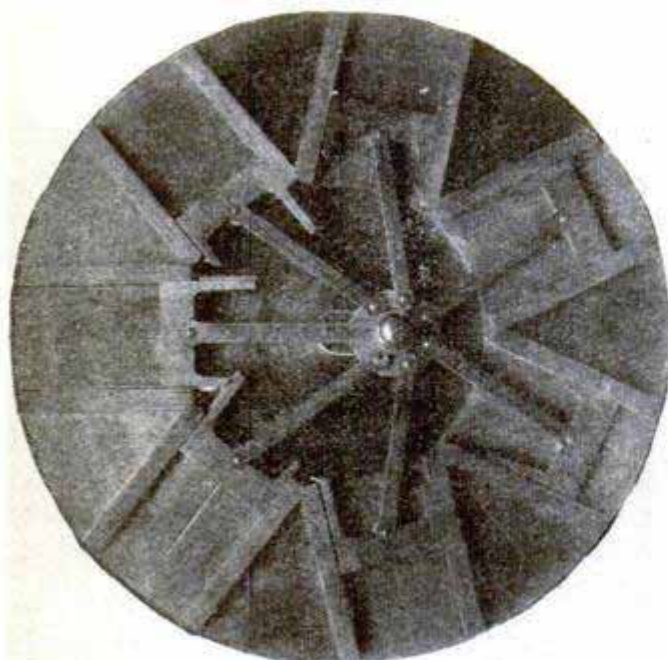
Prof. J. Rogers, president of the American University Union, was lowered 100 ft. into the crater of Asama, a Japanese semi-active volcano.

## UNIQUE NEW AIRSHIP MOTOR



Engine Mounted on Propeller

The accompanying photographs show a new design of a motor used for



The Wood Model of Pistons and Cylinders

design and is mounted direct upon the propeller and revolves with it.

The motor has seven air-cooled cylinders which revolve about the centerline of the propeller shaft. The relative positions of the pistons and connecting rods are indicated by the wooden model as shown in one of the accompanying engravings. The details of the crankshaft and gearing, as well as the cylinder casting, are also shown. This French engine operates at a speed of 1,200 r.p.m. and weighs only 168 lb., developing under a normal load 50 hp. The seven cylinders are each 4.33 in. in diameter and have a stroke of 4.72 in. The fuel consumption is said to be 70 cu. ft. of gas per hour or about .65 to .8 lb. per horsepower per hour. On account of the rapidly revolving cylinders being in a continual blast of air, they are efficiently cooled, and the weight usually required for radiators and cooling water is avoided. The bearings and cylinders are lubricated by oil pumped to them under high pressure.

For aeroplanes a smaller engine has been designed having five cylinders and developing 30 hp. This motor operates at a speed of 1,300 r.p.m. and



Cylinders Are Cast in One Piece

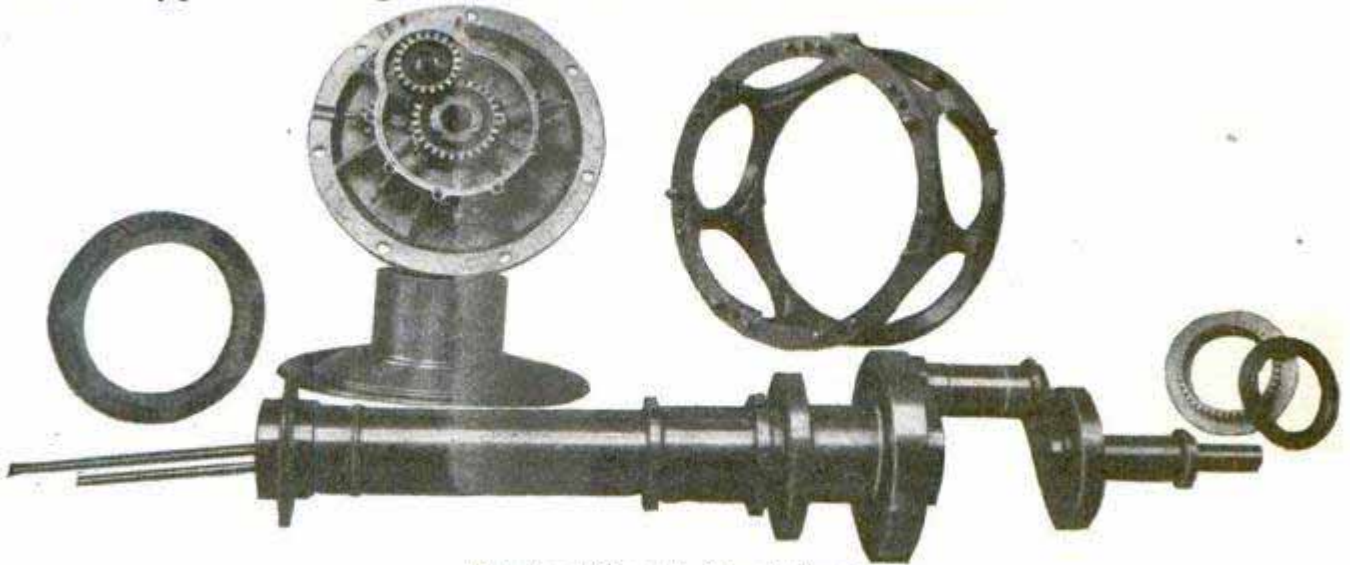
airship service by the Societe Des Moteurs Gnome. The motor is of French

weighs only 132 lb. The bore is 3.93 in. and the stroke is 3.93 in.



A large engine, of fourteen cylinders, has also been constructed of the Gnome type. It weighs 220 lb. and

train of such animals in a little town in the heart of the northern territories of Southern Australia.



Details of Crankshaft and Gearing

has an output of 100 hp. The bore of the cylinders is 4.33 in.; the length of stroke, 4.72 in.; speed, 1,120 r.p.m.

### AUSTRALIAN CAMEL TRAIN

The parched, dry character of many parts of the interior of Australia demands beasts of burden of a kind that can live a long time without water. Consequently, Australia is importing a large number of camels from the Sahara desert, many of which are now in active service. In a recent issue was shown a mail coach drawn by camels, and this illustration shows a

Many years ago a number of camels were brought to America by the government for army use in the American desert, but one by one they were allowed to escape. Probably all of them fell victims to wild animals or the Indians, but occasionally reports of one or two of them, or their descendants, being seen, are circulated.

A non-inflammable film for moving-picture machines, made by treating cotton with an acetic, anhydride and acid mixture, is being manufactured by one of the largest photo supply houses in the United States.



Camel Train in Interior of Australia

## THE SONG OF STEAM

Harness me down with your iron bands,  
Be sure of your curb and rein,  
For I scorn the strength of your puny hands  
As a tempest scorns a chain.

How I laughed as I lay concealed from sight  
For many a countless hour,  
At the childish boasts of human might,  
And the pride of human power ;

When I saw an army upon the land,  
A navy upon the seas,  
Creeping along, a snail-like band,  
Or waiting the wayward breeze ;

When I marked the peasant faintly reel  
With the toil that he daily bore,  
As he feebly turned the tardy wheel,  
Or lugged at the weary oar ;

When I measured the panting courser's speed,  
The flight of the carrier dove,  
As they bore the law a king decreed,  
Or a line of impatient love.

I could but think how the world would feel,  
When these were outstripped afar,  
When I should be bound to the rushing keel,  
Or chained to the flying car.

Ha! Ha! Ha! they found me at last,  
They invited me forth at length,  
And I rushed to my throne with a thunder blast ;  
And laughed in my iron strength.

O, then you saw a wondrous change  
On the earth and the ocean wide  
Where now my fiery armies range,  
Nor wait for wind or tide.

Hurrah! Hurrah! the waters o'er  
The mountain's steep decline ;  
Time—space—have yielded to my power :  
The world, the world is mine.

The river the sun hath earliest blest,  
Or those where his beams decline,  
Those giant streams of the queenly West,  
Or the orient floods divine.

The ocean pales where e'er I sweep  
To hear my strength rejoice,  
The monsters of the briny deep  
Cower trembling at my voice.

I carry the wealth of the lord of the earth,  
The thoughts of his God-like mind ;  
The wind lags after my going forth,  
The lightning is left behind.

In the darksome depths of the fathomless mine,  
My untiring arm doth play  
Where the rocks ne'er saw the sun's decline,  
Or the dawn of the glorious day ;

I bring earth's glittering jewels up  
From the hidden caves below,  
And I make the fountain's granite cup  
With a crystal gush o'erflow.

I blow the bellows, I forge the steel,  
In all the shops of trade ;  
I hammer the ore and turn the wheel  
Where my arms of strength are made ;

I manage the furnace, the mill, the mint,  
I carry, I spin, I weave,  
All of my doings I put in print,  
On every Saturday eve.

I have no muscles to weary, no brain to decay,  
No bones to be laid on the shelf,  
And soon I intend you may go and play,  
While I manage the world myself.

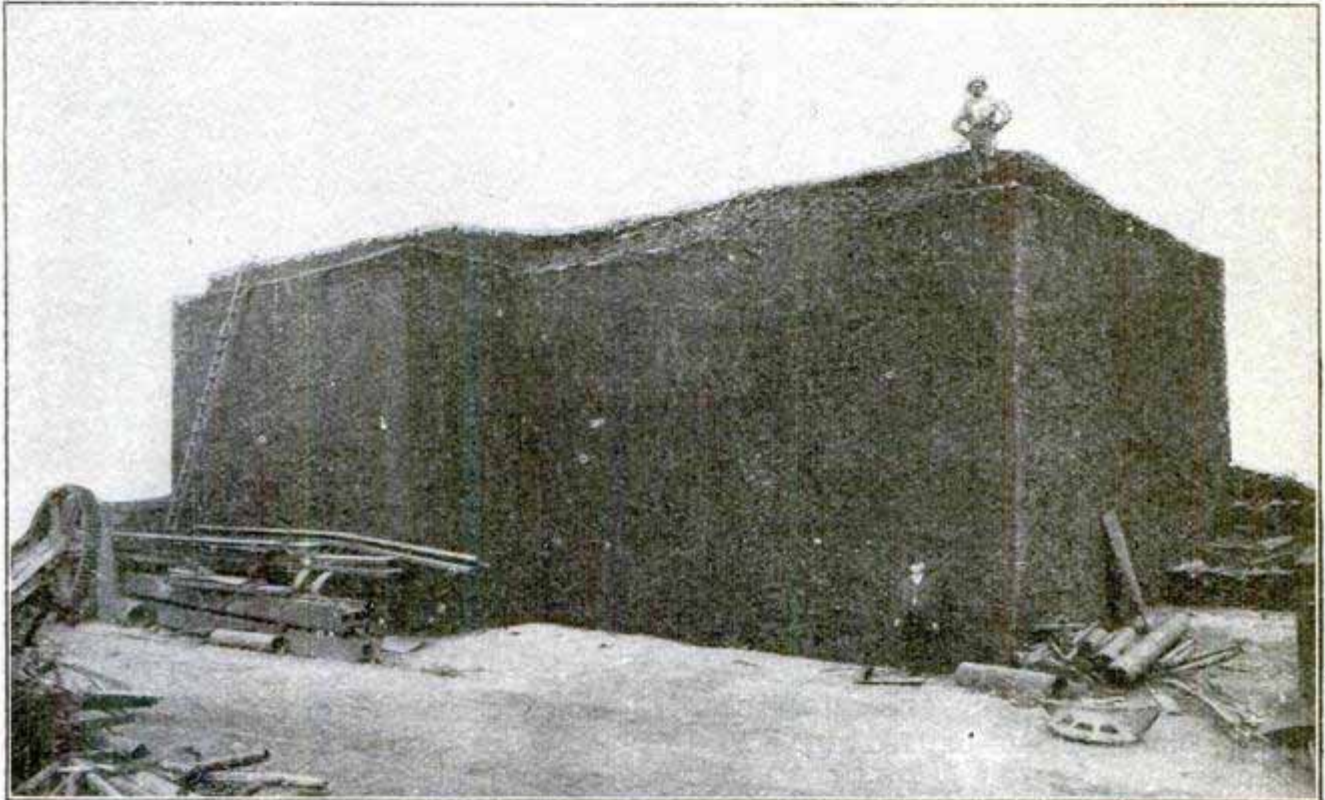
But harness me down with your iron bands,  
Be sure of your curb and reins,  
For I scorn the strength of your puny hands,  
As the tempest scorns the chains.

—GEORGE W. CUTTER.

## 20,000 TONS OF SAN FRANCISCO FIRE SCRAP IRON

Twenty thousand tons of scrap iron, collected from the ruins after the great fire in San Francisco, and making a pile 40 ft. high and 100 ft. square, was recently purchased by a steel company of Portland, Oregon. The scrap will be transported from San Francisco to Portland by the steamer "Saginaw," which has been chartered for that purpose. The Saginaw arrived recently

Pacific Coast, the next largest, 6,000 tons, having been made by the Italian government. Another shipment of 5,000 tons went to Philadelphia. The pieces of iron were gathered from the ruins of churches, stores, warehouses, railroads, and the homes of both rich and poor. They are the relics of hundreds of business and domestic tragedies.

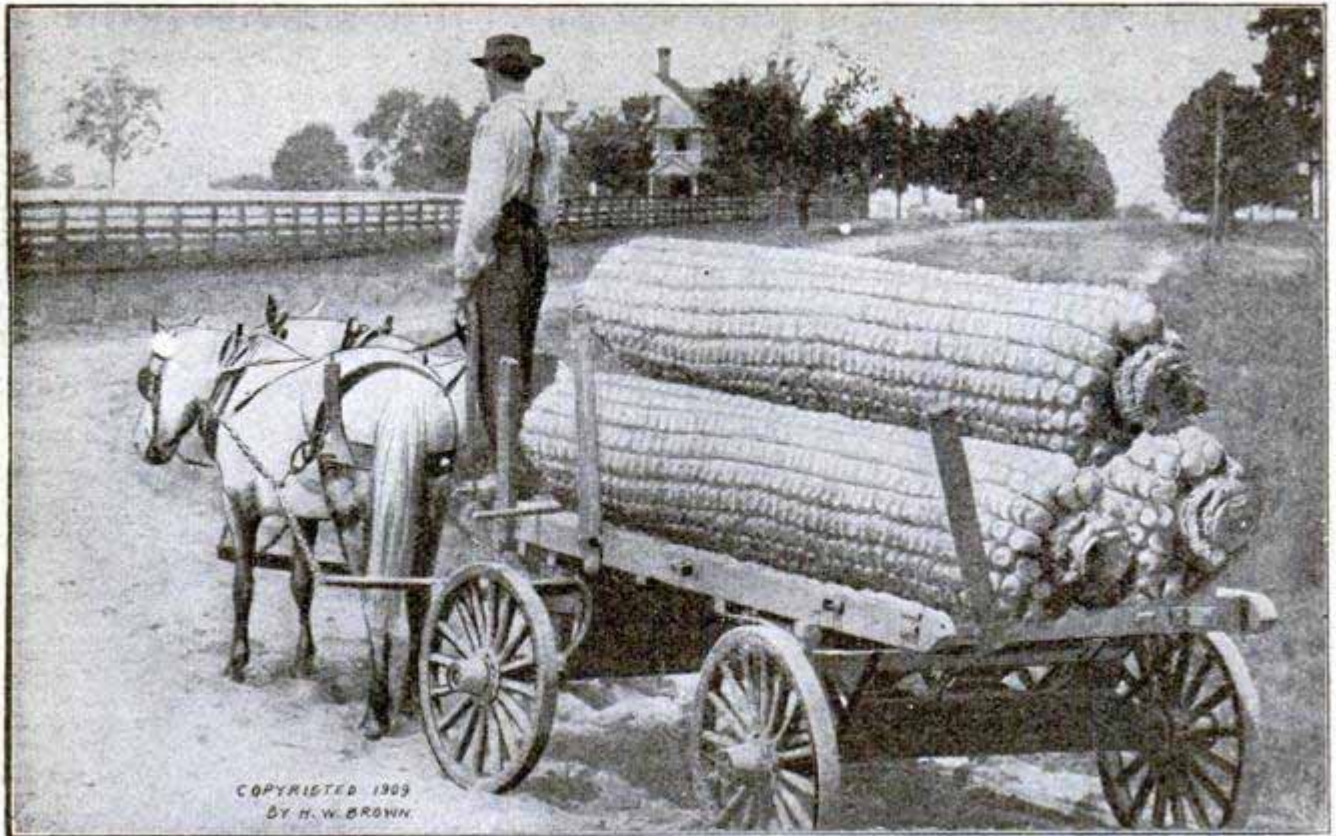


Scrap Iron from the San Francisco Fire

with the first cargo, comprising 800 tons, and it will require 24 more voyages to finish the job, which will take the better part of a year. Twenty-two carts are employed hauling the scrap from the place where it is piled to the steamer dock in San Francisco, and it is estimated that it will take 70 working days to finish moving the material. The scrap will be utilized by the purchasing company in its manufacturing business, and its cost, together with the expense of transporting it to Portland, represents an outlay of \$200,000. This is the largest pile of scrap from the fire remaining in San Francisco. It is the largest individual purchase of scrap ever made on the

### WHAT RECLAMATION COSTS

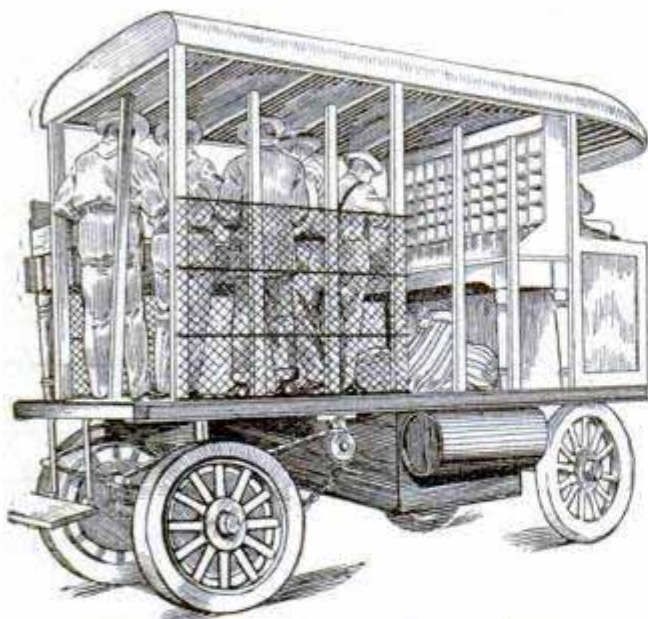
Records show that between June 30, 1903, and June 30, 1908, there was appropriated for the reclamation service the sum of \$41,230,975, of which amount there has been expended \$37,146,094, leaving a balance of \$4,084,881 on hand. To this amount President Taft proposes to ask an appropriation of \$10,000,000 in the next year, but this is claimed to be not enough. The ten million is already being expended every year, and more, for the expense of building irrigation dams and ditches in the desert has been going on for some time at the rate of \$1,000,000 a month.



A Nebraska Guarantee Against Famine

## AUTO MAIL WAGON IN WHICH MAIL IS SORTED

The saving of time in the handling of mail by having it sorted and placed in respective bags for different trains and destinations has caused the postal



Sorting Letters in Auto Mail Wagon

authorities at Los Angeles, Cal. to construct an auto mail wagon sufficiently large to accommodate four mail clerks

and the required sorting tables, pigeon holes and mail bags. This machine picks up the mail from boxes in all parts of the city between the hours of 11 in the morning and 8 in the evening, making rush trips at certain times to unload. While the machine travels its route the mail clerks within it are busily canceling stamps, sorting letters and tying them into bundles ready for delivery to the transcontinental and suburban trains. On the first day of the new service this moving postoffice handled 17,000 letters.

The car used, although experimental and not entirely suited to the purpose, being nothing more than a hastily improvised delivery truck, was successful enough to encourage the postal authorities to give serious consideration to the construction of special cars for the purpose. The plan saves an immense amount of labor at the main office and sub-stations and also means a great saving of time in the dispatch of first-class mail matter.

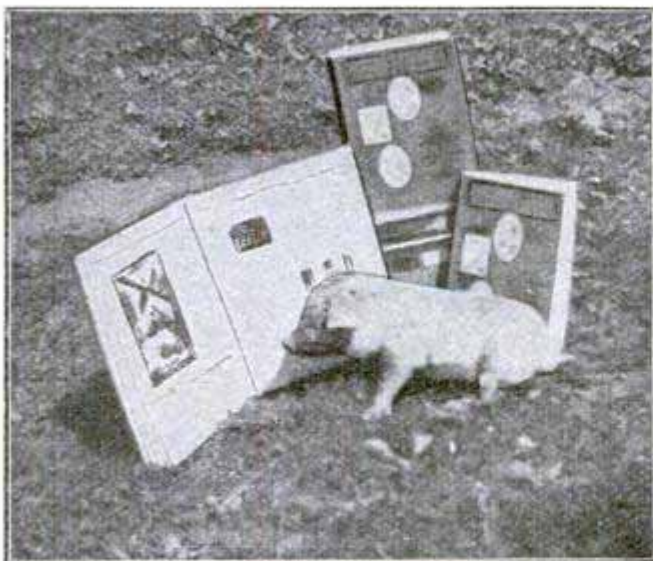
## AUSTRIAN GOVERNMENT FIGHTS SNAKES

Austria's new territory, Bosnia and Herzegovina, participants in the serious Balkan unrest of a year ago, is as undesirably rich in snakes as is claimed was Ireland before St. Patrick drove them from that country, consequently the government is taking extreme measures to exterminate them.

In the ten years ending in 1905 the annual death roll from snakes in this territory averaged 13 persons and 1,338 head of cattle, horses, and other domestic animals. Hundreds of persons also were bitten, but recovered. In 1906 the provincial authorities commenced giving money premiums for the killing of snakes, and of the 30,056 brought in, 25,438 were poisonous. In 1907, the reward, becoming more generally known, was responsible for the killing of 280,718 snakes, and the number killed in 1908 was very nearly the same. Even with these results it is estimated that the work of extermination will take 10 years more at the least.

## PHOTOGRAPHER'S LITERARY PIG

An enthusiastic photographer of St. Anne, Ill., shows how a pig can be

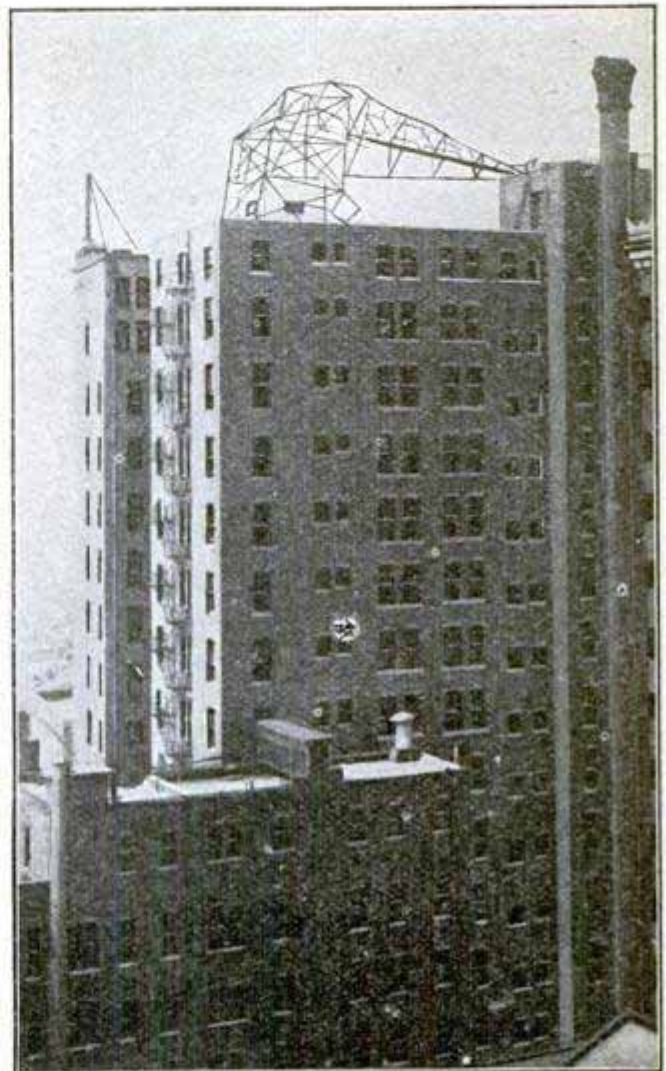


Fond of Pictures

made to appear literary by a judicious arrangement of books in the background before snapping the camera.

## WIRELESS DESTROYED BY STORM

A photograph of the new double wireless installation on the roof of a



Wrecked Wireless Tower

hotel in New Orleans was published in the October issue of this magazine. This illustration shows the wreck of the tower by the storm which created so much havoc in the south in the month of September.

## AVIATION WEEK AT JOHANNISTHAL

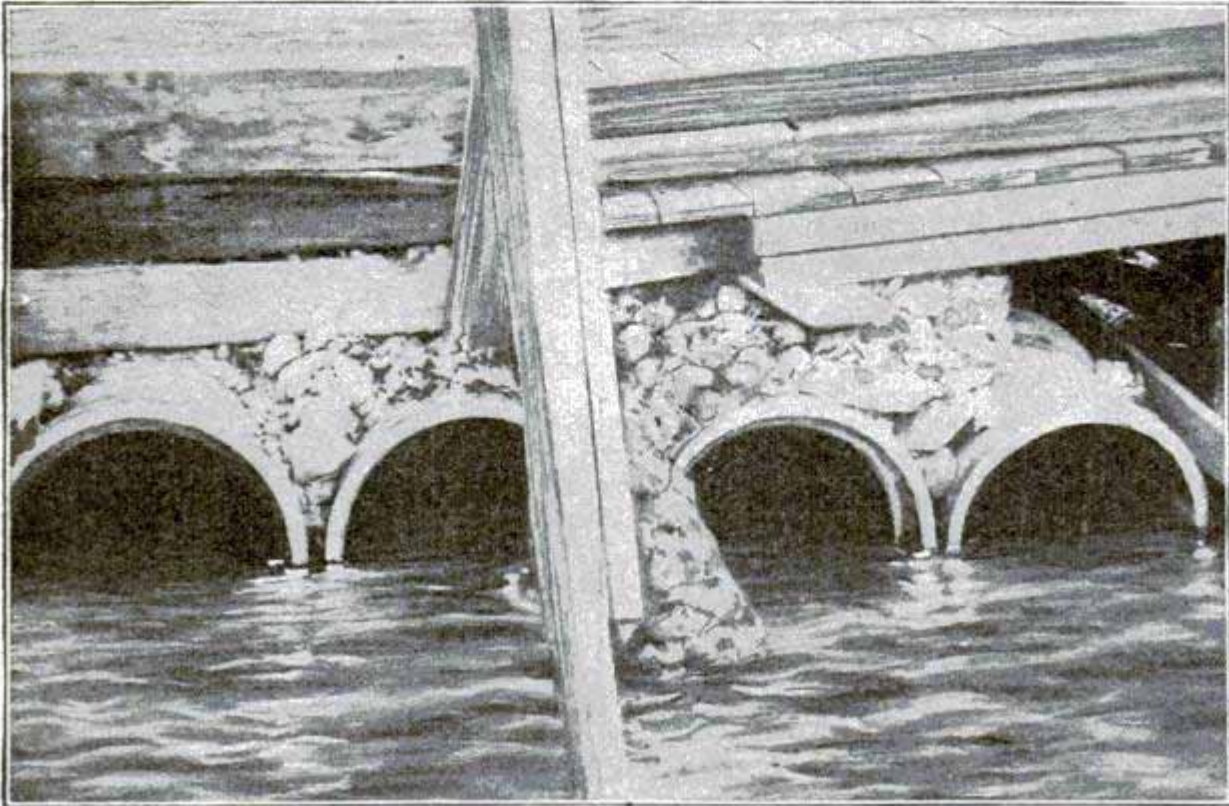
The big prizes for the events during aviation week at Johannisthal, Germany, which closed Oct. 3, were won by M. Rougier with a Voisin biplane. His winnings amounted to \$15,000. The events awarded to him were for distance, about 80 miles; the most prolonged flight, 2 hours, 38 min.; and the highest flight, about 470 ft.

## BRIDGING A RIVER WITH TILE

During the building of a concrete arch bridge over the Fox river at Geneva, Ill., the contractors formed an unique

## OWNERSHIP OF THE AIR

To the Editor:—Your editorial in the October issue relative to aerial trespass and the legal points involved,



A Bridge Made of Tiles

temporary bridge by laying 2-ft. tile side by side across the stream. These rest on the rocky bottom of the river, and on top of them was placed a bedding of rock, earth, and cinders. Between the sections of the tile, where the water was too deep to allow of this road formation, it was found necessary to sink piles and bridge the gap with stringers. Over this structure heavy teams passed safely, while the water was carried through the tile.

Shortly after the temporary bridge was completed a heavy freshet caused the water to rise to such an extent as to flow completely over it, but the tile held its place and traffic was resumed as soon as the water returned to its normal level.

An enormous hydro-electric project, in which the River Rhone is to be dammed below the rapids, some 13 miles from the Swiss frontier, with a fall of 230 ft., is contemplated in France.

has attracted my attention. This question, in the form of a case, came before the Yale Law School Moot Court last spring and created considerable local interest at that time.

Counsel pleading trespass based their argument on the Common Law axiom that "Land hath also, in its legal signification, an indefinite extent, upward as well as downward." Blackstone.

Counsel for the defendant based their argument on the question of control, claiming that from time immemorial man has only actually owned what he has controlled and man has never controlled the air to any great height above the surface.

The Judge, in his opinion, said there was no question but what a man would own up into the air a reasonable distance probably ascertained by the height of buildings. Beyond that point man would have no control, consequently no ownership. By this judgment the "Court" exploded the old Common Law theory of ownership

from the surface to the zenith, and discarded it as obsolete. "Common Law based on custom is subject to change with change of custom."

While the question of aerial flight near enough to the earth to frighten domestic animals or interfere with property rights is reasonably well settled, the question as to the higher altitudes is yet unsettled by competent authority. The only logical answer, however, seems to be as held by Yale Moot Court that "There is a High Seas in the air."

L. R. R.

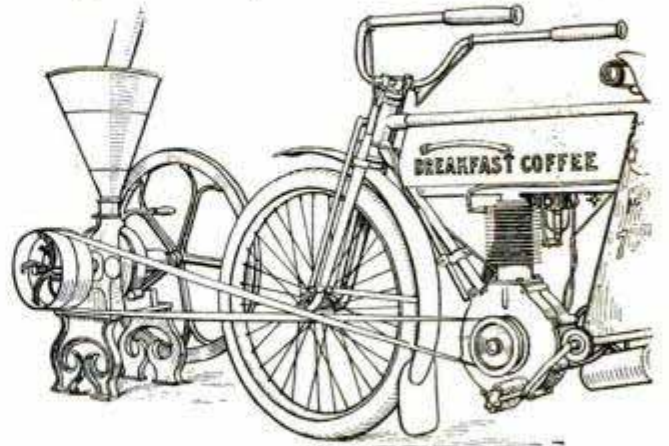
Norwich, Conn.

### AUTO FOR SOLITARY TRAVEL

It is a fad of Baron Pierre de Crawhez to travel and shoot in countries where distances between habitations are far and comforts lacking, but his idea does not entail the giving up of such comforts, therefore he travels in the automobile shown in the illustration. It is a large affair especially designed to meet his requirements, the chief of which is sufficient space for the carrying of all the little conveniences that life in the thickly populated centers of the world make almost indispensable.

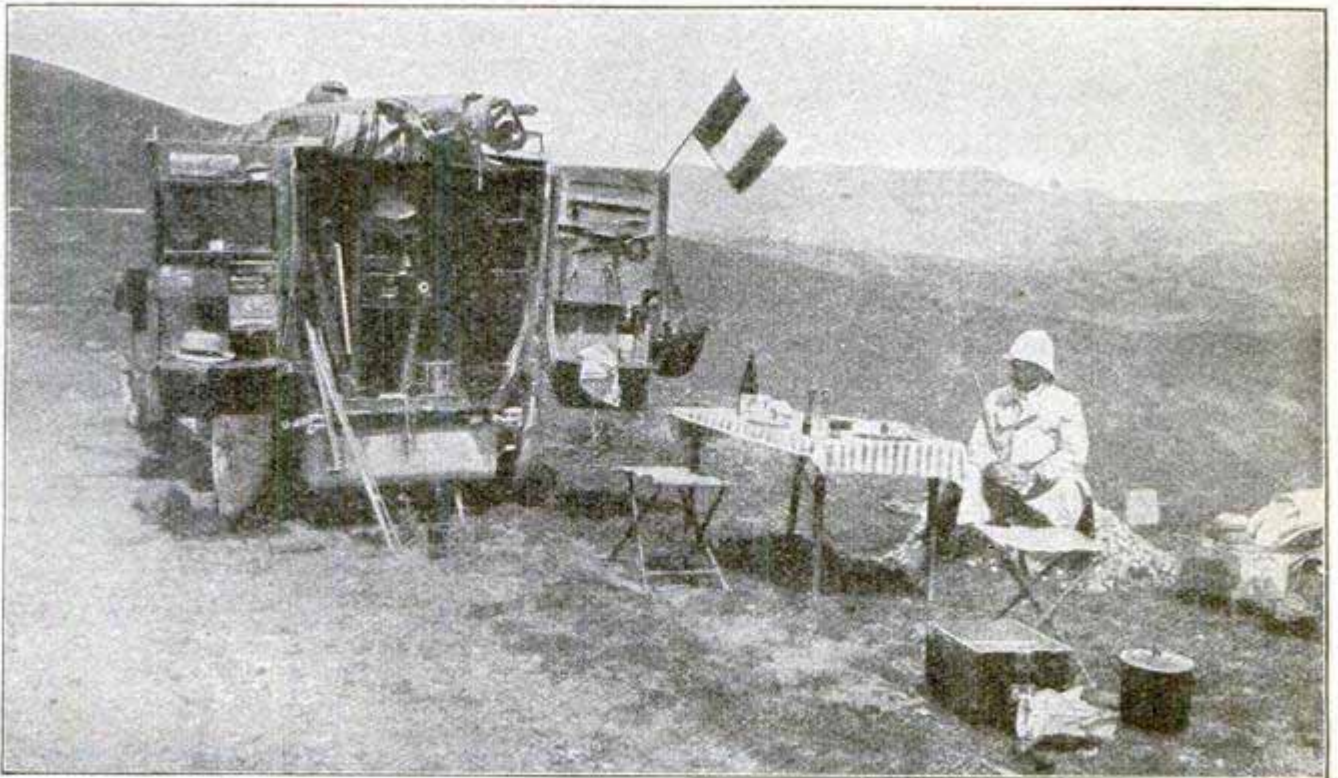
### MOTORCYCLE HITCHED TO COFFEE GRINDER

A coffee company in Denver, Colo., was recently left without power to run its grinders by a boiler explosion in



An Emergency Power Plant

the power plant of the gas and electric company of that city. The company had a large order for ground coffee that had to be filled, and someone suggested that one of the motorcycles used for calling on customers be utilized. Consequently, the machine was braced in line with the grinder, the regular driving belt was disconnected from the rear wheel and one from the grinder substituted, and the substitute power was provided for a steady four hours.



Comfort Assured in Desolate Regions

### VACUUM SWEEPER PUMPED BY HAND

As this vacuum sweeper is passed over the surface to be cleaned, the two handles are separated and brought to-



New Type of Vacuum Cleaner

gether, thus operating an air pump which sucks the dust in. The current of air passes through a small vessel containing water, and this water catches the dust.

### Y. M. C. A. TO TEACH AERIAL NAVIGATION

The west side branch of the New York Y. M. C. A., which drew attention several years ago by opening a night school to develop auto chauffeurs, has opened an evening course in aeronautics to fit the men for the coming industry connected with the building and handling of aerial machines. A new industry, the officers of the association believe, is rapidly being created, and just as automobiles brought employment and wealth to thousands who were wise enough to fit themselves for that industry, aerial navigation now promises great rewards to those with the same foresight.

No attempt will be made in the first

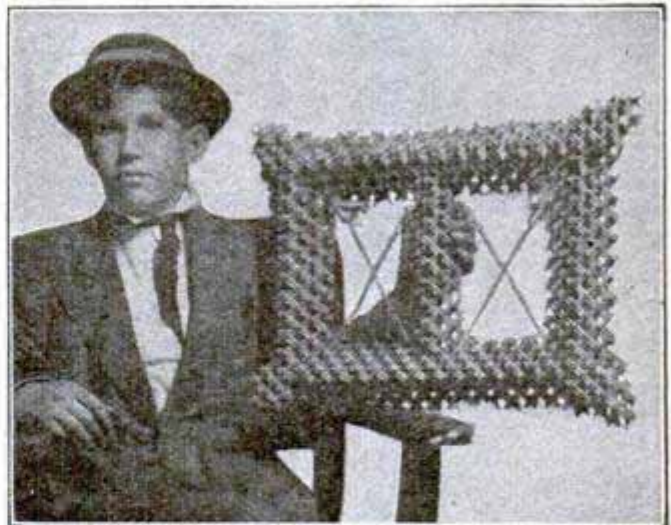
course to give students actual flying practice, though this may develop later, but there is ample work in flying models and in constructing miniature planes of various types for much experience. The department is under the direction of Wilbur R. Kimball.

The first course of study is designed to prepare owners and prospective owners for participation in, and enjoyment of aerial sport; to train aero chauffeurs and mechanics in the principles of aeroplane management; to teach practical men the principles of construction; to aid civil and mechanical engineers to learn the aerial requirements, and to prepare writers, advertising men and salesmen to specialize in the new field.

The course includes law of gases, resistance and supporting power of the air, shapes of surfaces, study of kites, lift and drift, soaring and gliding flight, screw propellers, motive power, superposing surfaces, equilibrium, steering apparatus of various forms, and transmission systems.

### PICTURE FRAME OF 3,000 PIECES OF WOOD

The picture frame shown in this illustration represents the patient work of William Jones, a 15-year-old Tacoma newsboy, during his spare time in a period of six months. It is made



Six Months' Work on Frame

of 3,000 pieces of soft pine, each piece of which was shaped by the aid of a pocket knife.



## EDITORIAL

Familiarity with danger induces a disregard of danger. The student who is unable to look down from a three-story building without being dizzy, becomes a mountain climber who delights in perilous positions, where a misstep means death in the chasm a half-mile deep. The naturalist who at first shuddered at the picture of a snake learns to take the most deadly serpents in his hands, while discoursing on the beauty of their head and eyes. Another who as a child was terrified at a Fourth of July firecracker hums a merry tune as he stirs a pan of nitroglycerin in the making. One who has grown to manhood without ever seeing a locomotive is overwhelmed with terror upon beholding one in motion for the first time.

Our land has become such a network of railways bearing trains which dart back and forth at all hours that the people have become careless and use the tracks as a convenient and usually the shortest footpath. This practice is responsible for 47,416 deaths during the past ten years, an average of thirteen every day. Should thirteen persons be killed in a single railway accident our papers would devote front page columns to the event, while newspaper photographers filled other columns with pictures of the wreck and victims. And the number is rapidly increasing, due partly to more dense population and partly to the increasing disregard of danger. For instance, on the Pennsylvania system 781 were killed in 1904 in this manner, while the record for 1907 shows 915, or nearly three a day.

Legally all these persons were trespassers, who not only paid no attention to the thousands of warning signs, but each one would have felt that his individual right was being infringed had he been arrested and fined for the offense.

In England the law of trespass on a railroad right of way is rigidly enforced against the public, with a consequence of comparatively few fatalities. In that country also the grade crossing is practically unknown, and railroads are required to either erect a bridge for the highway, or carry their tracks overhead, in both cases providing a safe passage for pedestrians, teams and motor vehicles.

It is understood the railroads are uniting for a vigorous campaign to secure the enforcement of the present state laws against walking on their tracks, but an equally desirable improvement would be state legislation eliminating the grade crossing, or at least greatly reducing the number, and requiring bridges wherever the track is not clearly seen in each direction from the highway.

\* \* \*

While on the subject of railroads it is well to remind the powers that direct their policies that the public will not much longer endure the annoyance and loss incident to the smoke nuisance from locomotives in the larger cities. In Chicago, notoriously smoky, it is estimated that from 35 to 40 per cent is directly due to steam locomotives. The financial loss from this cause amounts to millions of dollars, the direct loss to one hotel alone in this city being \$50,000 a year. Railroad management has felt much aggrieved the past few years over radical state legislation which in some cases was undoubtedly too severe, but the swinging of the pendulum of public opinion past the point of absolute fairness was the natural result of a long-continued and high-handed system of disregard of that public's rights. On the question of smoke-making in cities the roads will do well to profit by their experience of the past, even though anthracite coal and coke do cost more per ton than soft coal.

\* \* \*

Foreigners marvel at our lofty buildings, our railroads, our intense energy; they are amazed at the swiftness and confidence with which we decide and complete enormous undertakings, on which they would deliberate for years; but the greatest wonder of all is the American Flag on the High Seas. In foreign ports where tall masts fly a galaxy of colors, speaking the language of many nations, the Stars and Stripes are as scarce as buffaloes in Iowa.

If the North pole came floating in on an iceberg, it would excite scarcely more surprise. Once there sailed out of New England ports hundreds of hurrying craft, searching out the uttermost

parts of the earth. They have long since disappeared. A few remain engaged in coastwise traffic, carrying clams and coal.

With thousands of miles of coast line, and a possibility for every mile, our great harbors are filled with foreign ships; Boston, New York, Baltimore, Charleston, Gulfport, New Orleans, Galveston, San Francisco, Puget Sound—loading and unloading every day in the year; but the vessels were built across seas, are owned across seas, are earning money for people across seas, and only come our way when there isn't enough doing their way.

Merchants in England, Germany and France write merchants in South America, and get their answer in five weeks. The same service from the United States requires two months. During the entire year of 1908 only ten merchant ships under our flag entered that great, inviting gateway of southern South America, Rio de Janeiro, while England alone had 2,199.

The principle of a subsidy may seem extravagant to some, but it is really no more so than the money spent on our Weather Bureau and scores of other things. All the leading maritime nations have and are finding it a profitable investment, and their merchant marine grows; without it ours has withered away.

When Chile and Japan find it profitable to join in a subsidy to maintain an ocean pathway between their shores, it would seem as if the United States might now awake from its Rip Van Winkle sleep, and resurrect its shipyards. Ship subsidies are not to benefit ship owners, though it makes them possible: it is to benefit every man, woman and child in the land.

The President has declared in favor of ship subsidies.

Let all the people shout, "Amen."

\* \* \*

A recent railroad wreck in Illinois, in which an excursion train running at high speed and carrying 500 passengers collided with another train, is unusual in two particulars. First, the presence of a steel coach at the forward end of the excursion train is credited with the remarkable escape of the passengers, of whom only one was killed and thirty-five injured. Second, farmers for miles around were awakened by the terrific crash, "and were soon on the scene in automobiles," in which the victims were hurriedly taken to the nearest town.

The farmer's automobile means much. It presages the day when his plow and planter and harvester will be motor vehicles; when the country roads shall be maintained in condition for traffic at all times. It means that, like his city brother, he will think nothing of a five or ten mile ride at the end of a day's work to make a visit to an acquaintance. Farmers who can go to town in twenty minutes, where formerly they spent two hours on the way, are no longer isolated. They become in point of time suburbanites. The ability to exchange frequent visits with others for miles around will make for that broadening of ideas which means a more enjoyable life, a longer life, and a larger financial return for their work. The man shut up with his own troubles and difficulties is unable to rid himself of their depressing influence; but once he gets away from his own environment even for a few hours, he returns to find them smaller and fewer than before.

\* \* \*

What a chip on the shoulder is the North Pole! As though we had not enough trouble trying to adjust its discovery, now comes the Dominion of Canada saying "nobody can own the Pole." As long ago as 1891 Canada claimed all the land up to and including the Pole. Now the contention is that our explorers state the Pole is in the midst of waters of the Arctic ocean, and is therefore literally and figuratively on the high seas. Such being the case the nations of the world have joint ownership, the smallest as much as the largest. Altogether it seems pretty tough on the old Pole, after waiting so many centuries to be discovered, to find at the last that it doesn't belong to anybody in particular.

In France they hold ice-covered water may not properly come under the rules governing land and high seas, and that according to the international conference at Berlin of 1884 to own is to occupy discovered territory. Such being the case the logical and most convenient settlement of the whole vexed affair easily resolves itself into one thing:

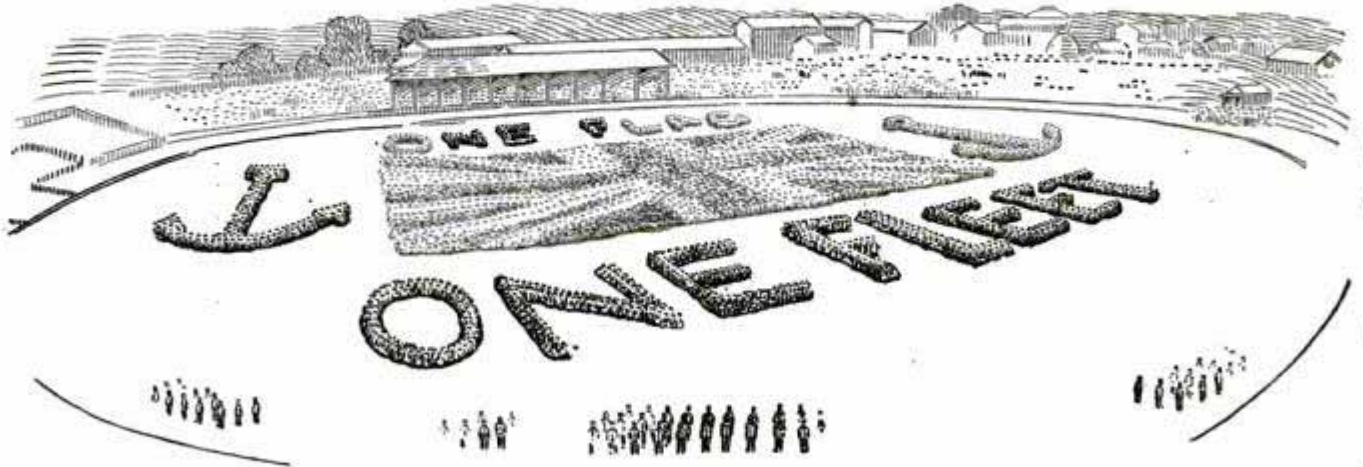
Send Cook and Peary to the Pole and keep them there.

H. H. WINDSOR.

## SYDNEY'S LIVING FLAG AND SET PIECE

Empire Day, the occasion on which England and all her possessions celebrate the fact that they are English, was made memorable in Sydney, Australia, by an immense patriotic set

piece composed of the English flag, two anchors, the words "One Flag; One Fleet," and a great border around the whole, all made up of children from the public schools. The tableau was formed on the cricket ground, a stretch of turf bounded by one of Sydney's race tracks. Some idea of the size of the piece may be gained from the fact that it took over 7,000 children to form it, the border alone comprising 2,400 school cadets.



A Living English Flag

The words "One Fleet" have significance in connection with the recent proposal of several of the English colonies to come to the mother country's assistance in the maintaining of the supremacy of the seas. One of the colonies at least, proposed to build and maintain her own fleet, subject to call by the mother country should the need arise, while Australia proposed simply providing the money required.

## REINFORCED INNER AUTO-TIRES

Inner tubes for auto tires, reinforced with a partial insertion of fabric, are gaining much favor in England. This reinforcing permits the naked tube to withstand an internal pressure of 65

## BRIDGE HAS SLANTING ROADWAY

A comparatively low bank on one side of the Lehigh river near Catasauqua, Pa., and a steep hill on the other, has resulted in a bridge of curious design. The piers and framework of this bridge are like those of any other bridge of the same type, but the floor is on a decided slant. This construction idea does away with a steep approach to the bridge, and also carries the roadway and street car tracks



An Inclined Bridge

above railroad tracks which run along the shore at the level on which the flooring would naturally be expected to be.

In the cargo of a ship leaving a Pacific port for China recently were 25 logs over 100 ft. long to be used in the construction of a temple.



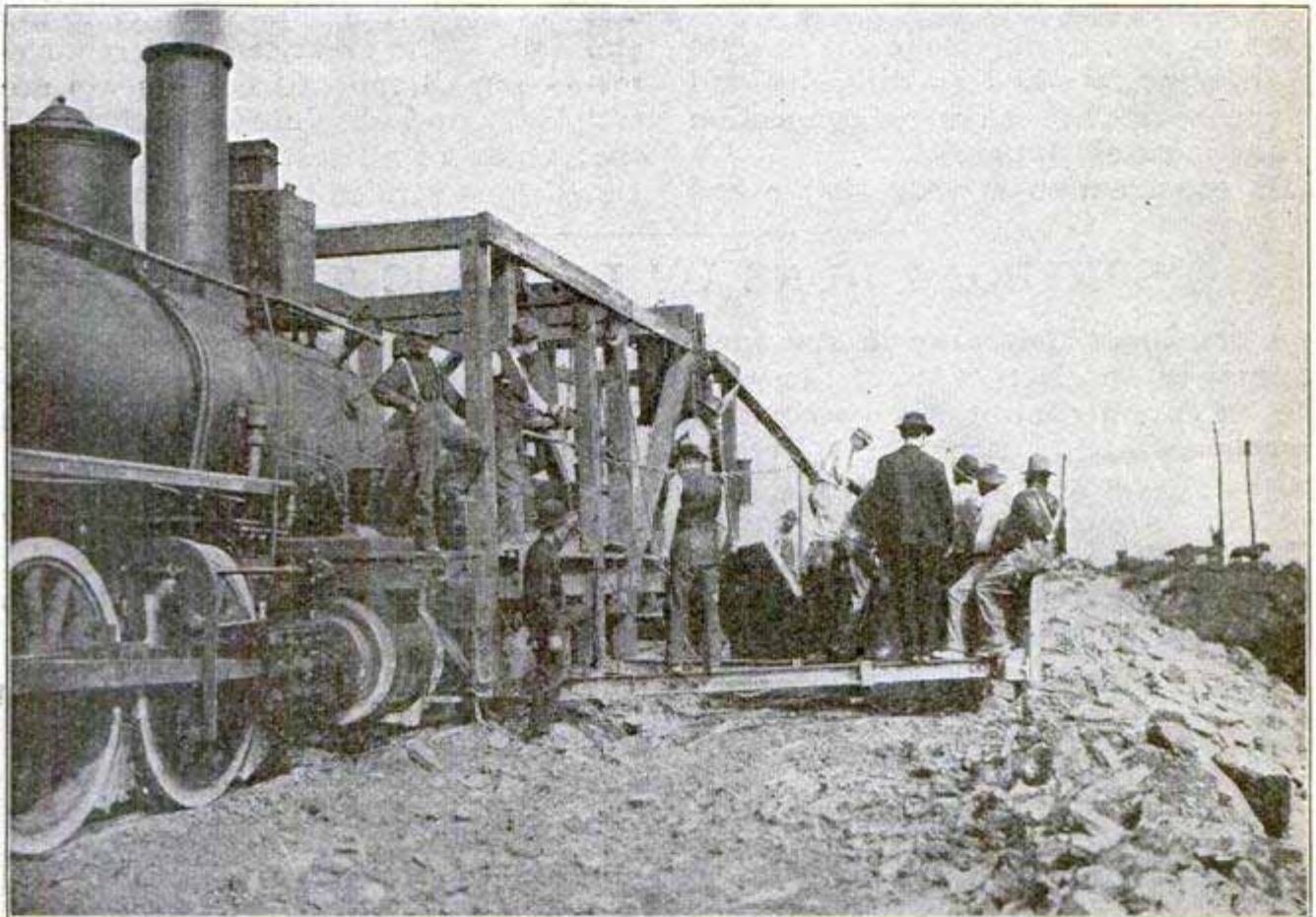
Dumping a 2,000,000-Ton Hill into a Hollow 3 Miles Distant—Dumping a Train of Cars by Compressed Air in Three Minutes

## MOVING A TWO MILLION-TON HILL

A 2,000,000-ton hill is being moved three miles in Cincinnati and dumped into an immense hollow which the C. C. & L. railroad is filling for a road-bed into Cincinnati from Chicago. To do this work quickly huge Panama canal diggers are at work eating out the hill and loading it onto pneumatic dumping trains of seven cars each. As fast as one of these trains is loaded it hurries away to the dumping grounds

a temporary siding track is laid upon the newly finished embankment and in this way the dumping cars keep moving close to the edge of the fill.

So far about a half million cubic yards of earth have been dumped into the bottoms. There is about a ton and a half of earth to the cubic yard, which means that 750,000 tons of hillside have already been thrown into the hollow and the job is only half finished.



The Big Spreader Which Levels Off the Earth Even with the Tracks

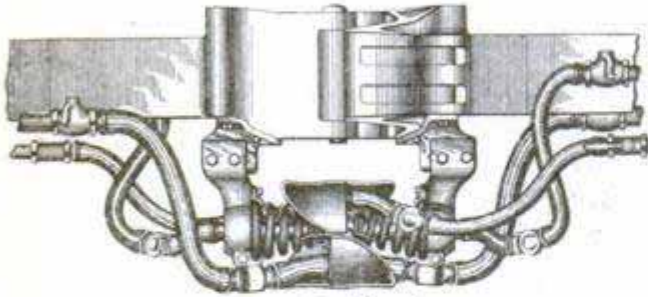
and an empty train of cars takes its place under the diggers. By a special automatic dumping mechanism the train of cars is dumped in three minutes by means of compressed air. As soon as the freshly dumped earth is left by the dumping trains, along comes a big spreader which saves the work of hundreds of laborers. It is pushed along by a locomotive and plows through the soft earth like a snowplow and levels off the earth even with the tracks. And when this is finished

#### AUTOMATIC AIR AND STEAM COUPLER FOR CARS

A new air and steam coupler for cars has been designed and built which automatically makes such connections between freight cars or passenger coaches simultaneously with the coupling thereof and in like manner becomes disengaged when the uncoupling of the cars takes place.

The application of the device is very simple, requiring no more than 30 minutes to equip a car. It is not neces-

sary to make any change in the style of hose generally used and it can be immediately coupled to a car not equipped with the automatic contrivance. Liberal provision has been



Automatic Coupler

made for the inequalities in the heights of different cars and no difficulty will be encountered in making a connection on the most abrupt curve.

Its construction is very simple and

no parts are affected by weather or climatic conditions. It entirely eliminates the wear and tear of hose connections which insures the efficiency of the air brake. No jar is witnessed in coupling or uncoupling and the jerk so often damaging to air brake pipes gives way to the new device. The construction and manner of fastening to cars will be readily understood by referring to the accompanying sketch.

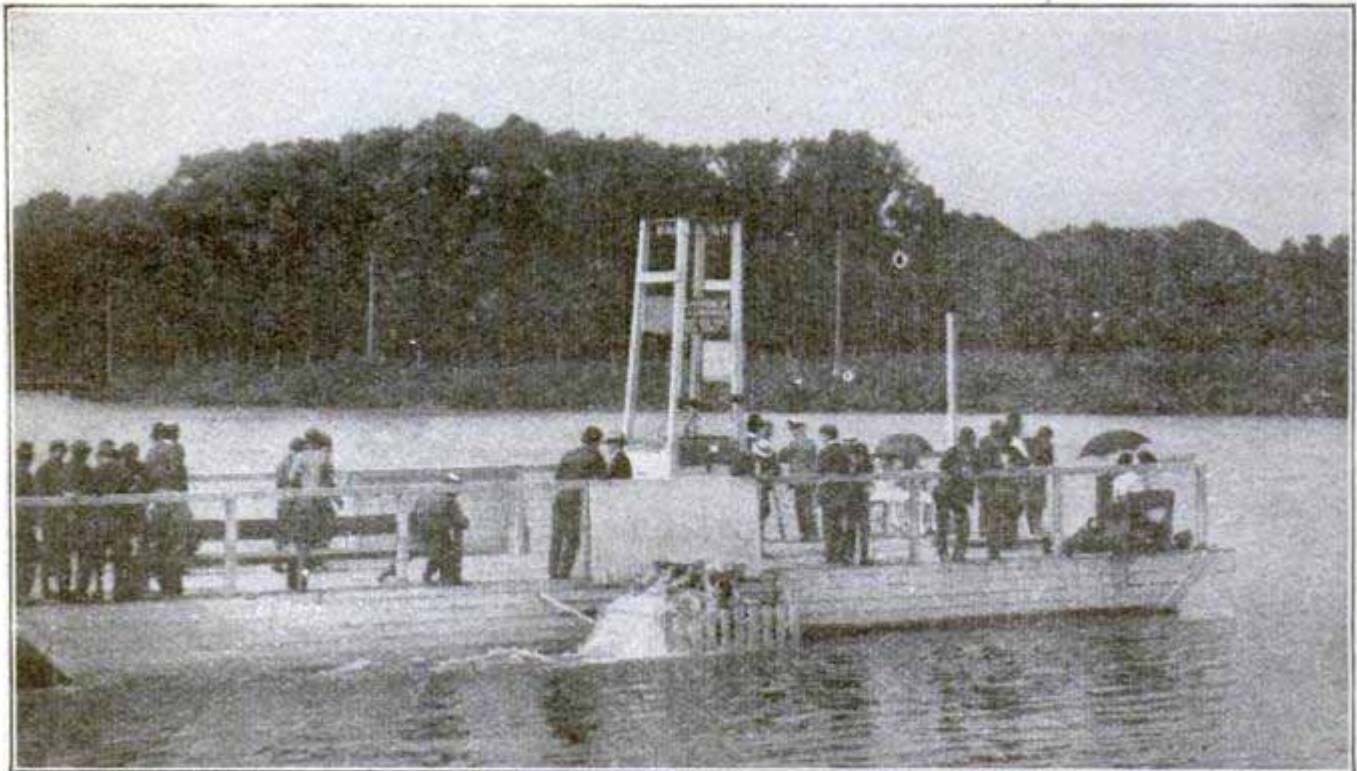
There is unquestionably a wide field for a device of this nature, for it will not only facilitate the making up of trains, but will minimize danger to life and limb. The great essential requirements for all railroad equipments are simplicity and absolute reliability and the results of all tests of this coupler show great strides toward these ends.

## FERRYBOAT RUNS BY ELECTRIC TROLLEY

A ferryboat that runs in the same manner as an electric street car, with the exception that it has two paddle wheels instead of two trucks, creates much interest near Rockford, Ill. It is used by an interurban electric road to transport its passengers to the parks and picnic grounds across the Rock river. The electric motors, receiving

power through a trolley, drive two paddle wheels. No fare is charged on the boat, therefore its crew consists of a motorman only.

The railroad mileage of the United States at the close of the fiscal year of 1908 was 230,000 as compared with 184,648 in 1898.



Being Trolleyed Across a River

## TREES TO SAVE WATER SUPPLY

One-third of a ton of Douglas fir seeds, capable of growing 25,000,000 trees, was planted by the national forest service last fall in the forest reserve through which flows the Bull Run river, the source of the water supply of Portland, Ore. The river starts in the glaciers of Mount Hood, and experts believe that it will continue to furnish an abundant water supply for the next 50 years, but it is the periods after that time that were under consideration when it was decided to increase the flow of the river by covering bare slopes with woods.

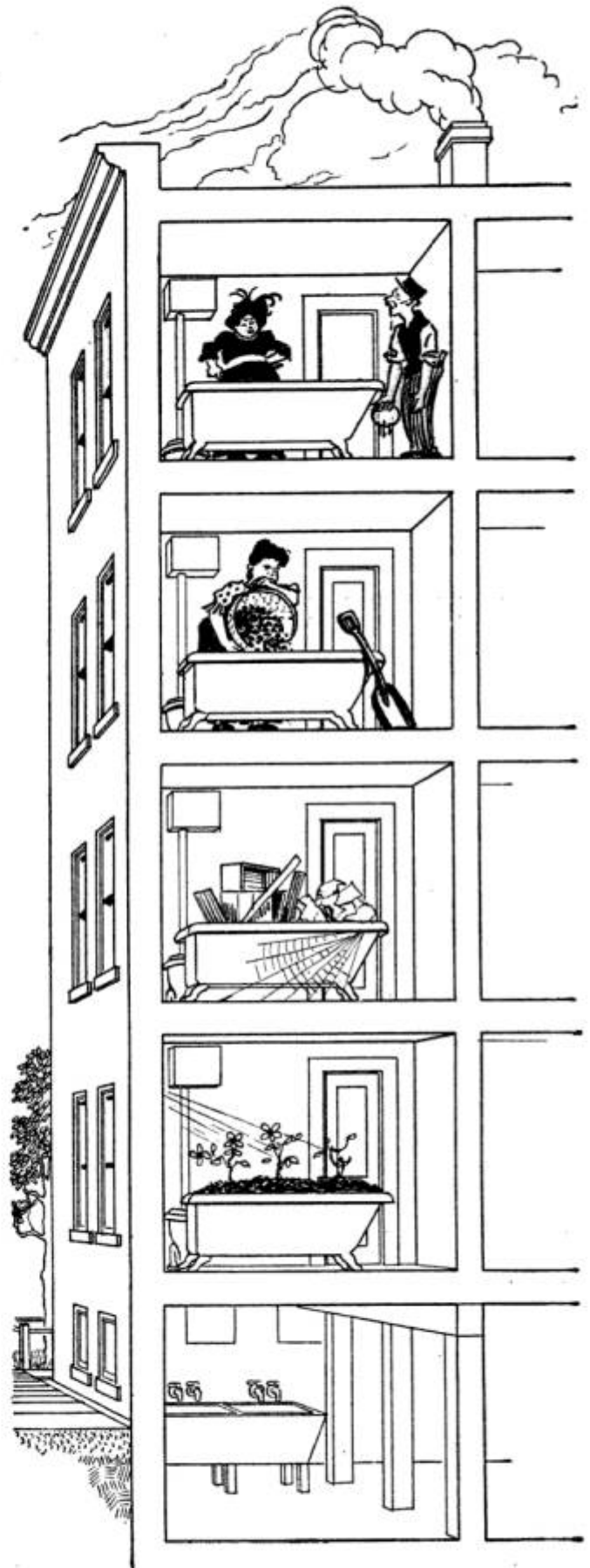
It is expected that when the fir trees have attained a fair growth the flow of the stream during the dry season will be doubled. In 50 years the bare hills will be covered with fir timber that will conserve the surplus moisture of the winter months, giving it out slowly throughout the dry periods of the years.

## MISUSE OF BATHTUBS IN TENEMENTS

In many cities serious efforts have been made to improve living conditions in tenement houses, especially as concerns sanitation and cleanliness, but results are often so disheartening as to make model tenement owners wonder "what's the use."

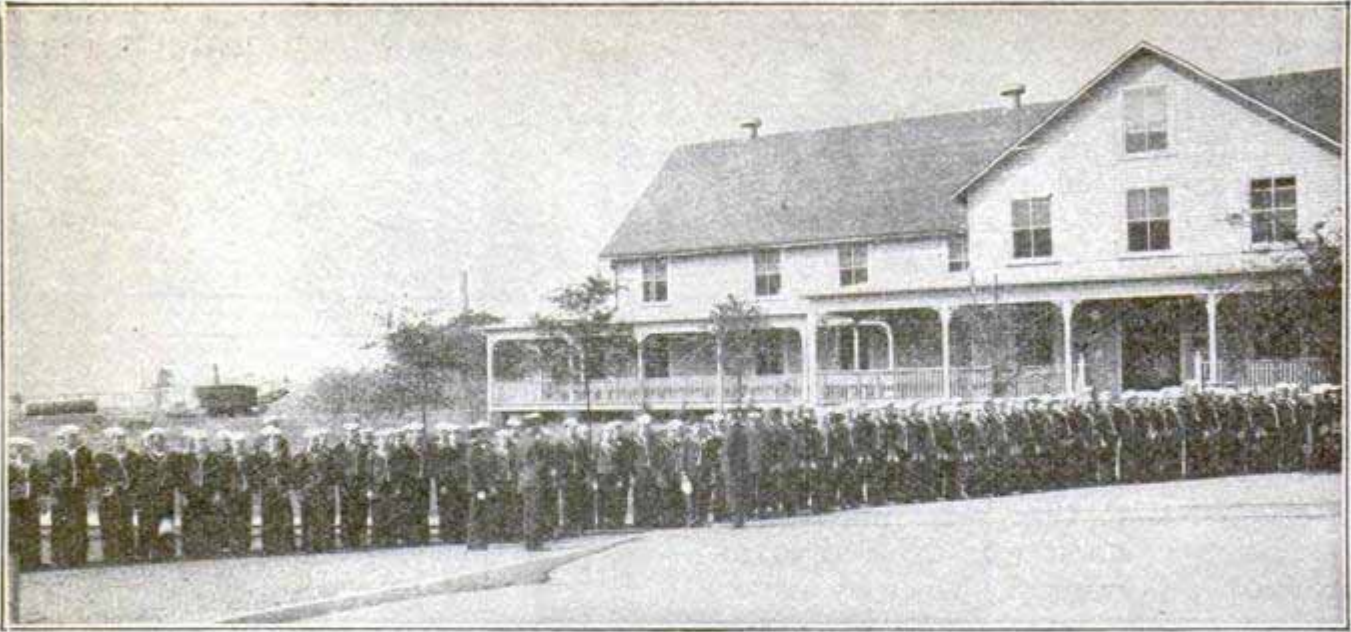
These illustrations show some of the means in which bathtubs in many tenement houses are misused and abused. Many optimists insist that it results from the fact that the tenants do not know what a bathtub is for and that they will soon learn to appreciate its presence, but the reason for the misuse in many cases is due to the fact that the setting aside of valuable space which would only be used perhaps once a month for the purpose it was provided for is considered wasteful. Consequently, some bathtubs are used as receptacles for coal and other fuels, as a convenient place into which to throw rubbish, and sometimes, when

the bathroom window is in a position to admit the sun, is filled with dirt and



Utilizing Waste Space in Tenements

attempts are made to grow small vegetables or flowers.



Gunnery Class at Washington

## TEACHING GUNNERY TO NAVAL RECRUITS

The U. S. navy maintains a school for the instruction of the enlisted men in all matters pertaining to ordnance and gunnery. It is known as the "seaman gunner's class," and is divided into two sections. One of these is at the Washington, D. C., navy yard, where the men are instructed in all that relates to the battery and the other is at the Newport torpedo station, where they study torpedoes.

The class at Washington has the advantage of the knowledge to be gained at the naval gun factory located there, which includes the assembling of guns, the breech mechanism, the manufacture of fuses and shells, the working of electrical firing devices, and the taking apart and putting together of all kinds of ordnance machinery. Most of the time is spent in the shops, where the use of tools is learned, but a portion of each day is spent in the class rooms studying text books, as well as at the proving grounds where the large guns and armor plate are tested.

The course of instruction is open to any enlisted man under 30 years old who has served one enlistment, and received honorable discharge with marks of not less than 75 per cent. The purpose of the school is to educate the younger men for the position of petty

officers in the ordnance department of a ship, and graduating is usually followed by an advancement in rating, carrying with it an increase in pay.

The illustration shows the class assembled, with the commanding officer presenting a life-saving medal to one of the men.

## PROFESSOR PENCK ON THE POLAR CONTROVERSY

Professor Penck, director of the Berlin Marine Museum, in a recent public address said:

"I have known Peary for years. He is a man of unusual energy and tenacity. I consider him thoroughly reliable and am not disposed to doubt his statements. We know the imposing character of his work in Arctic exploration, and have to thank him for the proof that Greenland is an island and that polar journeys are to be made with the help of Eskimos. I do not know Dr. Cook personally; but the statements of reliable men like Stolberg and Amundsen seem to guarantee his trustworthiness. It is true that the Americans have not always been convinced by his accounts of his previous exploits. I have studied his work upon polar traveling. It is written sensationally rather than scientifically. But great travellers have often been disbelieved. Marco Polo could not con-



vince his contemporaries; Baffin's word was doubted for years; Stanley met with incredulity. Scepticism can only be removed by the presentation of scientific reports. We must wait for the reports of Cook and Peary, who have hitherto published only literary accounts of their work. I do not comprehend how Dr. Cook can have parted with his diaries. For the moment neither he nor Peary can furnish scientific proof that they reached the Pole. Both of them have described the region round the Pole; both assert that it is a frozen sea; but if this be so, the only means of establishing the identity of the place to the satisfaction of subsequent explorers would have been to take accurate soundings. Astronomical observations are not reliable. They can never give the certainty that the Pole has been reached. Such observations often vary by as much as one minute of latitude. Dr. Cook's statement that he was convinced he was at the Pole because the sun remained for twenty-four hours at the same altitude is simply impossible. With good instruments the changes in the sun's altitude in spring can be sharply determined, and in any case Cook must have observed a much greater altitude after twenty-four hours than he observed before. I can only repeat that neither Cook nor Peary has proved that he reached the Pole. Neither was so equipped that he could supply a scientifically geographical description of the polar district. Eskimo evidence is

worthless. The head of a scientific institute might as well invoke the testimony of his servant in regard to an important experiment."

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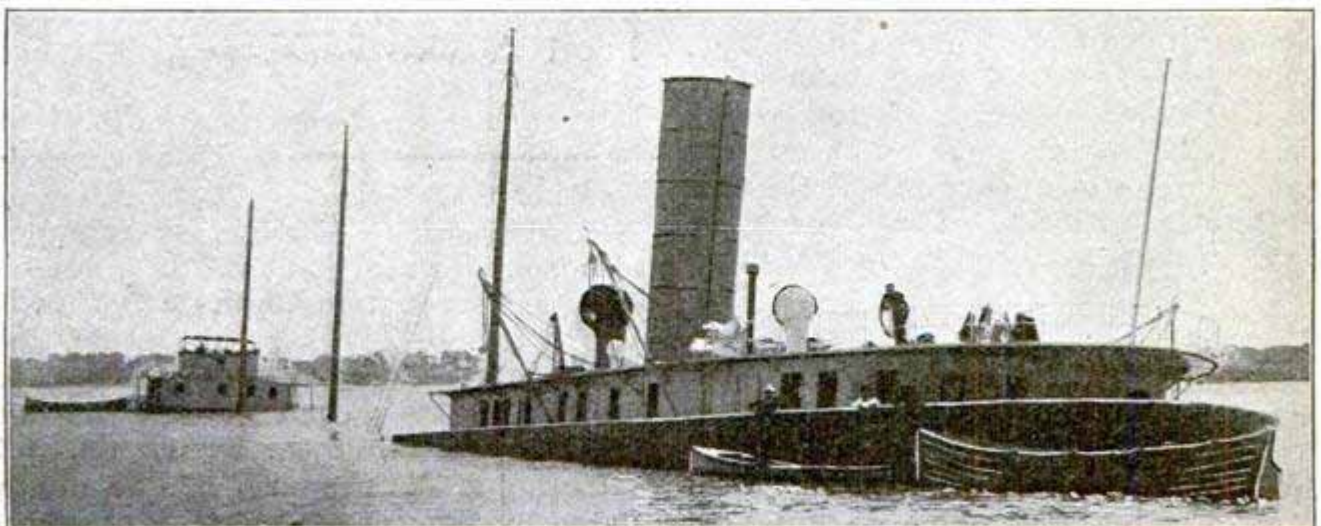
### OILED ROADS BREAK SCENT

The futility of hunting fugitives with bloodhounds, when the trails of those sought lead across the modern oiled thoroughfares, was demonstrated recently in Oak Park, a suburb of Chicago. Many robberies resulted in an addition to the police force of two bloodhounds. Tests were made of the dogs' ability to follow trails, and all proved successful until the person making the trail took to an oiled street. The scent was immediately lost, according to the police, and the dogs were unable to pick it up again.

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### COLLISION IN DETROIT RIVER

The freighter, "Collingwood," owned in Collingwood, Ont., was struck by the steamer, "George L. Craig," in the Detroit river, off Detroit, and sunk 10 minutes later. The crew of 22 men had a narrow escape. The "Collingwood" was of 3,285 gross tons and 380 ft. long. She was loaded with coal and went to the bottom in 25 ft. of water. The "Craig" struck the "Collingwood" a glancing blow and was proceeding at only a fair rate of speed, or the damage would have been worse. The "Craig" was practically uninjured.



Scene of the Collision in Detroit River

## INTERESTING MODERN SUN DIAL

The sun dial shown in this illustration is an interesting example of such



Courtesy Keystone

Sun Dial That Marks the Shining Hours

“tellers of time” of the modern school. It is what is known as the “south vertical” type and was recently placed on the south wall of a home in Seattle, Washington. Of as much interest as the dial itself is the inscription, which truly tells that its mission is only to mark the hours during which the sun is shining brightly. The size of the dial and plate is 3 ft. 4 in. in length by 2 ft. wide.

Because of an ordinance that prohibits the practice of allowing fowl to run at large in San Francisco one chicken owner, who has an unfenced piece of land, ties twine to a leg of each chicken and stakes them out.

## THE MAGNETIC STORM

By Sir Oliver Lodge

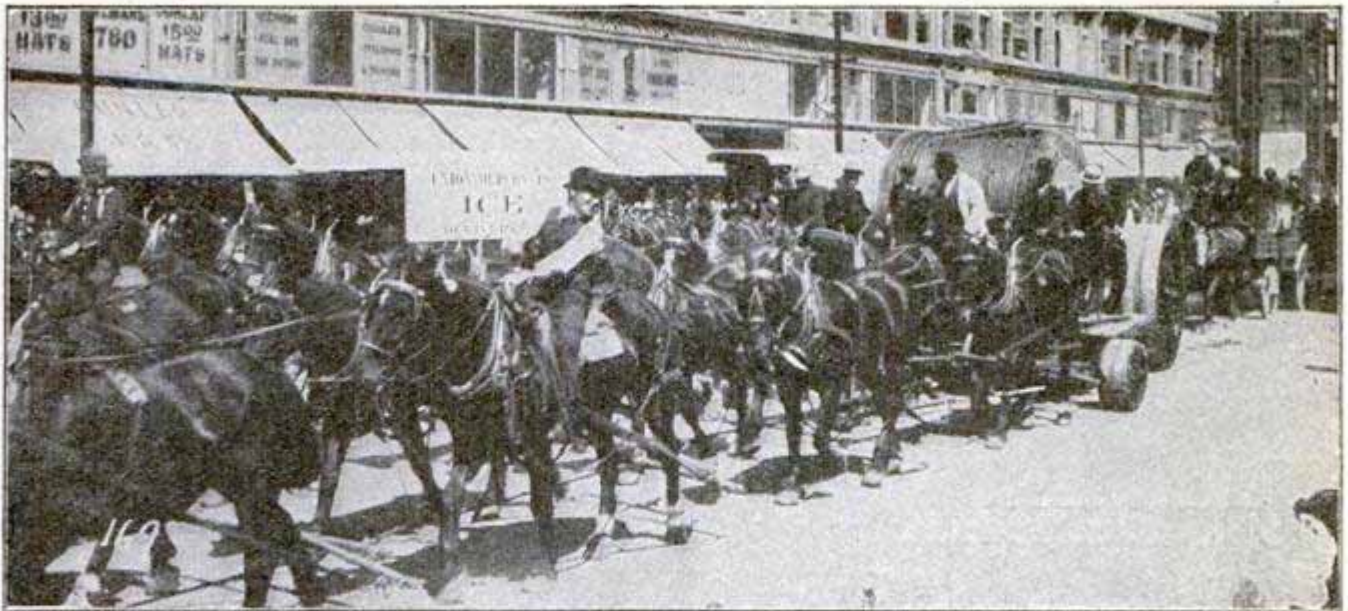
A cosmic electromagnetic disturbance, such as the earth experienced on Sept. 25, 1909, is now believed to be due to solar radioactivity. For, in addition to its ordinary radiation on which the earth entirely depends, the sun is at times technically radioactive, and the eruption not only produces sunspots, but also expels crowds of electrons, which fly with prodigious speed in straight lines after the manner of the Beta rays in radium. Whenever a torrent of these minute electrified projectiles rush past the earth, as they do at the rate of some thousand miles a second, they constitute a powerful electric current, and are liable to deflect magnetic needles.

Some of them, however, as in the recent case, actually encounter the earth's atmosphere, and though they are mostly deflected to the poles, some of them, especially at the times of the equinox, may come down near the equator. Those which journey to the poles are accompanied by an opposite current in the crust of the earth from the equator to the poles, and this it is which disturbs the telegraphs, being picked up or tapped by them en route. They also produce auroras in the neighborhood of the poles.

Those which enter the atmosphere elsewhere act as nuclei for condensation of moisture, and by screening the sun's rays are probably responsible for some of the dull and overcast weather. Local thunderstorms are also a not unlikely result.

These atmospheric conditions might be mitigated, at least so far as the dull weather is concerned, by artificial supplies of positive electricity to the upper atmosphere in large quantities; but no one has as yet thought the experiment worth trying on a sufficient scale.

There is no remedy for the magnetic storms due to cosmic causes, nor for the corresponding earth-currents, but telegraphic disturbance can be eliminated by the use of double lines or return wires.



San Francisco's Work Horse Parade

## SPOOL OF CABLE DRAWN BY 96 HORSES

One of the most notable features of the equine pageant held in San Francisco as part of the Admission Day celebration, Sept. 9, was a huge spool of steel cable on a massive truck drawn by 96 horses. The cable on the spool

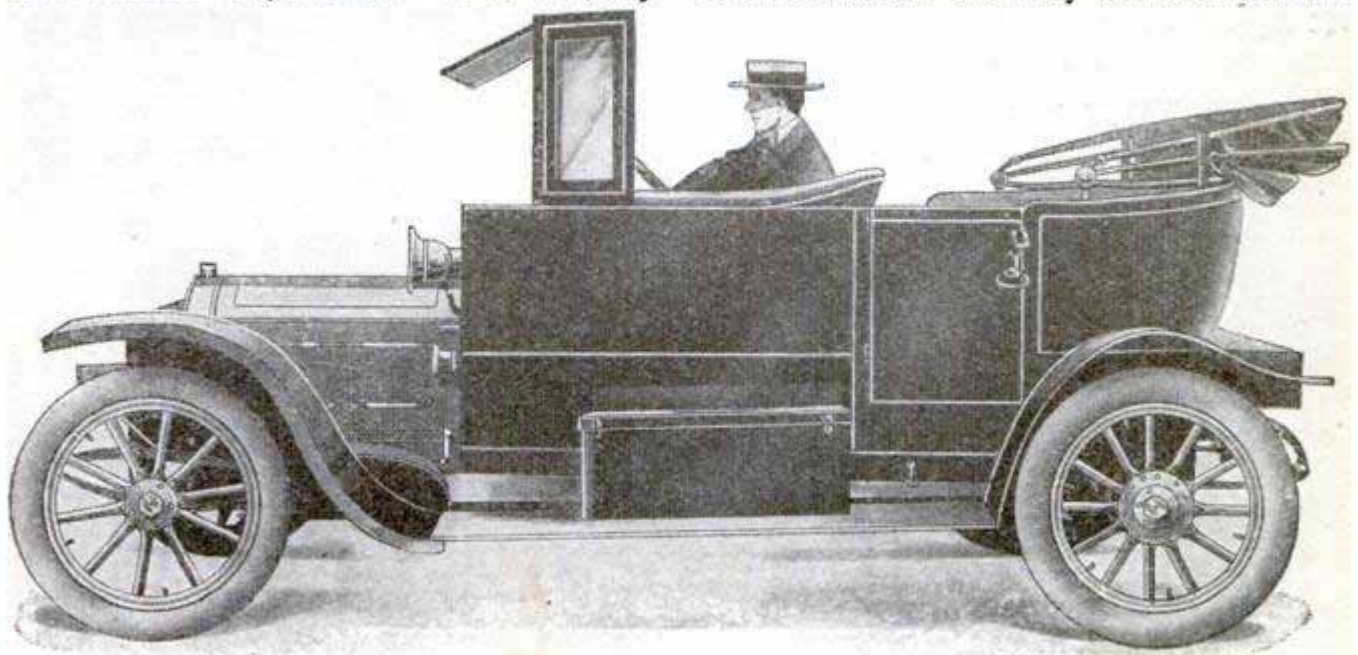
was nearly two miles long, and 2 in. in diameter.

The parade was one of the greatest exhibitions of work horses ever held, more than 3,000 horses, drawing loads of many kinds, forming it.

## TUB-LIKE AUTOMOBILE BODY

A new automobile body, known as the secretary body, is being commented upon favorably by the English automobile magazines. It is a body

that has only one entrance on a side, and this is between the front and rear seats. The front part of the body is inclosed all the way around and en-



General Appearance of New Body

trance to the front seat is gained by a narrow passage through its center, this passage in reality converting the seat into two seats, and only taking advantage of the space which actually is never used for seating.

Although it is premature to call the treatment an absolute cure for these diseases, it is certain, according to the hospital authorities, that when applied, pain almost instantaneously vanishes, which is a great step forward.

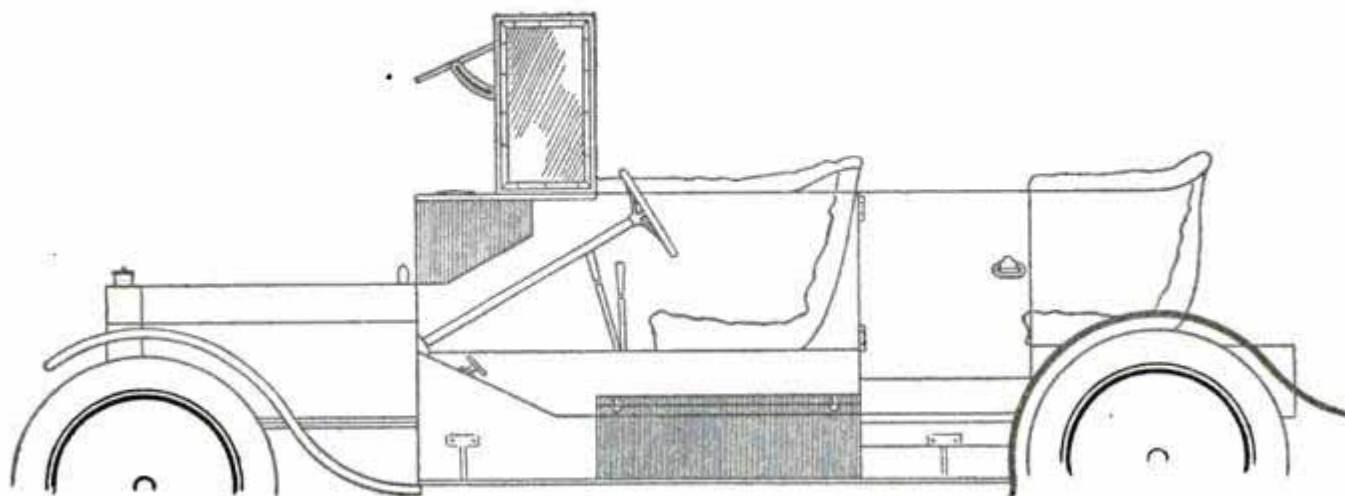


Diagram Showing Special Features of Body

Another unusual feature of the car is the position of the gasoline tank, which is placed in the angle formed by the dashboard and the upper line of the body. Under the tank extends the shaft to which the steering wheel is attached, and on the slanting floor under this is arranged the foot levers, as on ordinary cars. The top of the gasoline tank, which is covered with polished wood, is used as a table, and above this is a 3-sided dust screen. The appearance of the body, although spoken of as pleasing, reminds one at first sight of the shape of a tub.

### ELECTRIC TREATMENT STOPS PAIN

A new electric treatment has just been introduced in a Berlin hospital which is claimed to destroy bacteria within the human body by means of alternating currents of great potency but low tension. The method creates a source of heat in the innermost organs of the body, and a professor in the hospital states that the germs of cholera and inflammation of the lungs are either killed or incapacitated thereby, and that excellent results have also been gained in cases of gout and rheumatism.

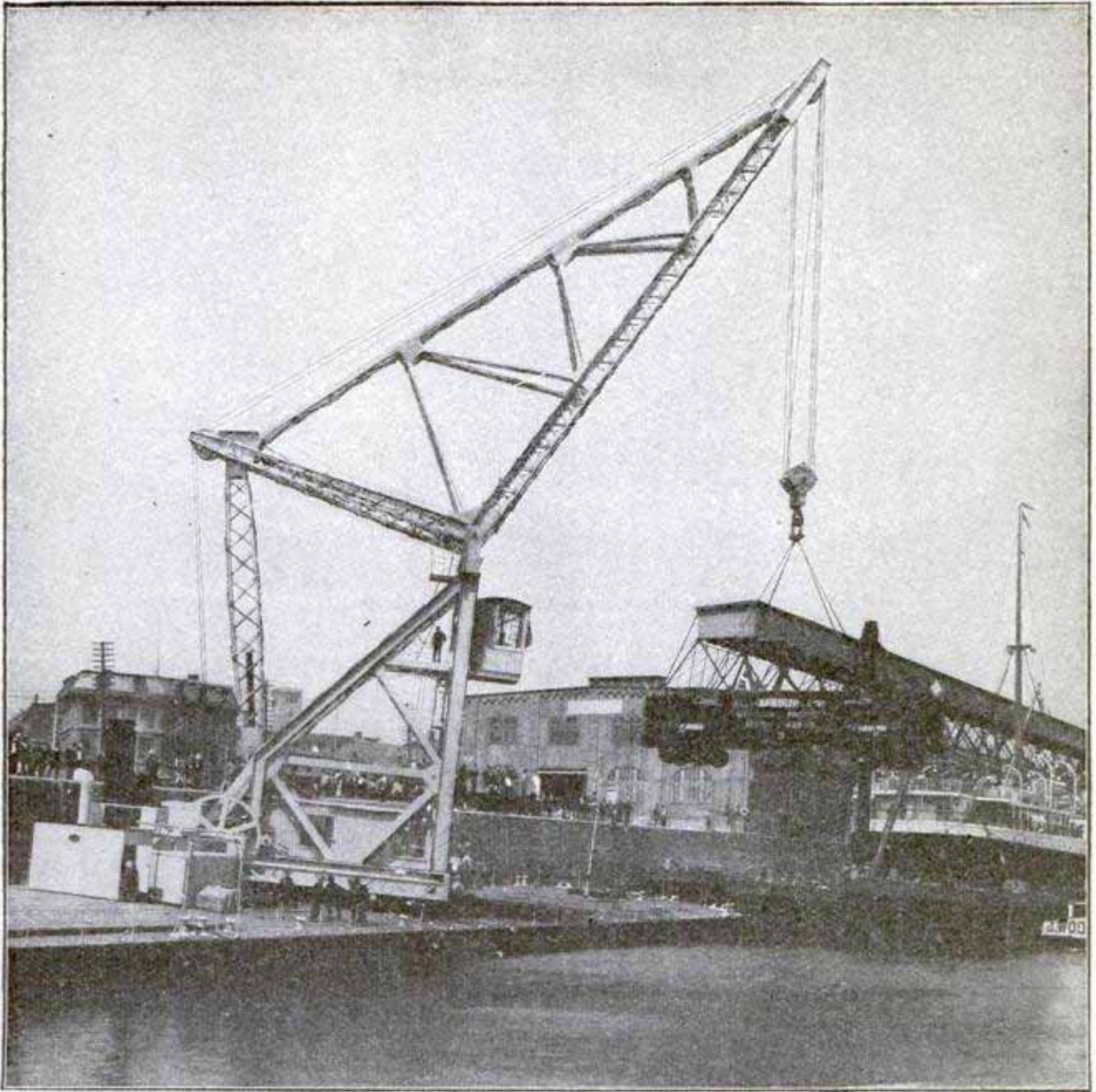
### SANDWICH-MEN ON ROLLER SKATES

In one of the cities in Europe the sandwich-men are goggled and wear roller skates, as is shown in this illustration. Both these additions to the usual costumes of such men aid in drawing attention, and the latter has



Goggled and Wheeled Sandwich-Men

the added merit of allowing them to cover more ground than if walking.



Powerful Floating Crane

### FLOATING CRANE LIFTS 75 TONS

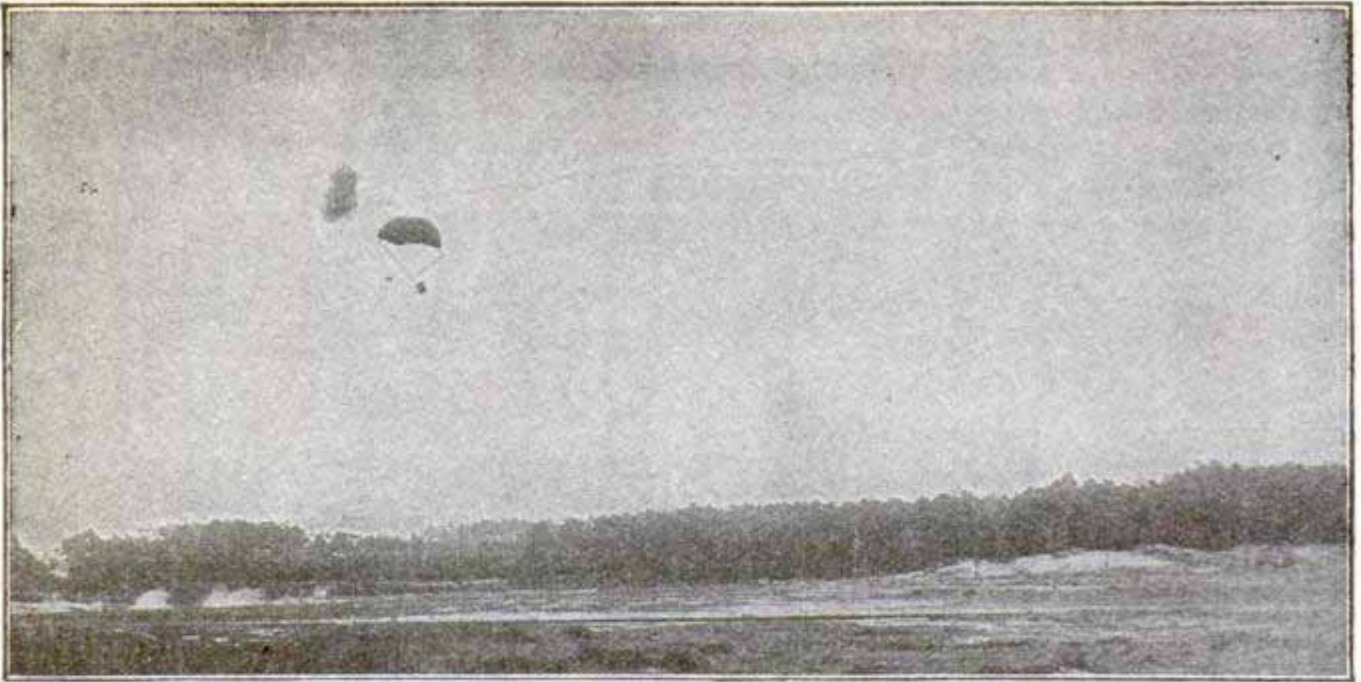
A huge floating crane, one of the most powerful in existence, is shown in this illustration lifting a steel car filled with coal, the weight of which was 75 tons. It is to be used in the harbor at Montreal. The illustration also shows a typical water scene in that Canadian city.

### GLASS-LINED CEMENT TANKS

Several years ago cement tanks began to take the place of wooden tanks in a number of French wine storage houses, but difficulty was experienced

in the fact that the acids in the liquid very often decomposed the cement, while the walls in turn absorbed the freshness and "bouquet" of the wine. This has been overcome by lining the tanks with squares of glass, tightly joined with cement. A tartar forms on the cement used for this joining and resists all acid attacks.

The glass-lined tanks may be used for all kinds of liquids except those containing a much larger percentage of acids than is found in the majority of cases, and are particularly useful in the storage of wines, alcohols, brandies, ciders, oils, gasoline, kerosene, turpentine, etc.



The Effectiveness of Aerial Artillery

### BALLOON DESTROYED BY AERIAL WAR GUN

The first actual demonstration of the effectiveness of the new guns evolved by the German army as means with which to fight aerial craft was given during the recent aerial exposition at Frankfort, Germany. A balloon, shaped something like a dirigible airship, was sent into the air and several of the new vertical aerial guns, mounted on automobile trucks, were directed to destroy it. A few moments after the bombardment commenced one of the shells took effect and the balloon exploded, nearly one-half of the envelope being blown away. The illustration shows the balloon a moment after the explosion occurred, while the gas was still escaping.

### DRIVING IN MIDDLE OF ROAD DESTRUCTIVE

Some time ago the Massachusetts board of highway commissioners caused to be erected along the highways of that state signs that requested drivers of all kinds of vehicles not to drive in the middle of the road. This action was taken because driving in the center of the road was believed to be responsible for the heavy repair ex-

penditure necessary. After the sign idea had been given a fair trial the commissioners reported that the cost of repairs was much less where the



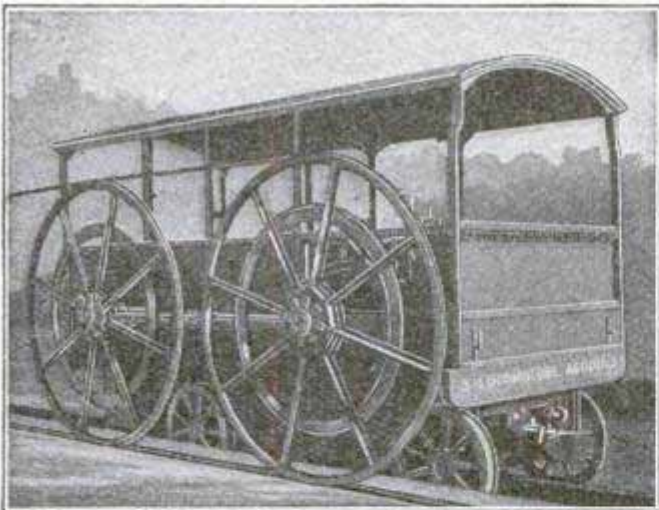
order was obeyed than where it was disregarded.

The illustration shows a state highway near Sterling, Mass., provided with such a sign.

## ITALIAN CABLE RAILWAY

On a mountain cable railway in Northern Italy the ordinary cables are supplemented by a "locomotore," the wheels of which are geared to grooved pulleys. The effect of the cable working on the pulleys on a tangent forms the tractive force, and this, it is said, admits of the employment of a cable not much more than half the size of those required under the ordinary system of cable operation. The grooved pulleys are the large wheels attached to the side of the locomotive shown in the illustration.

The method of working the system is as follows: At the top of the railway, which is 3,400 yd. long and contains gradients of 15 per cent, are placed two vertical power-driven pulleys around which the continuous cable is wound, imparting to the latter the motive power. The cable is then passed over a horizontal drum, thence down over the track to the lower end of the railway, over another drum, and then back again to the top of the incline over small grooved pulleys placed along the center of the track. On the way it

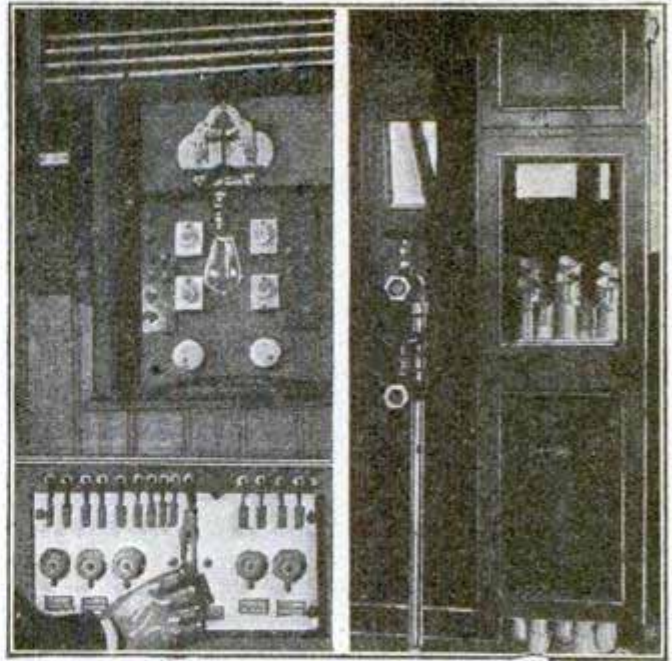


Cable Railway "Locomotore"

is wound around the vertical pulleys of the locomotive, to which it imparts motion.

## SAFEGUARDING A LINER

These illustrations show three of the many pieces of mechanism on an ocean liner to aid in the safeguarding of pas-

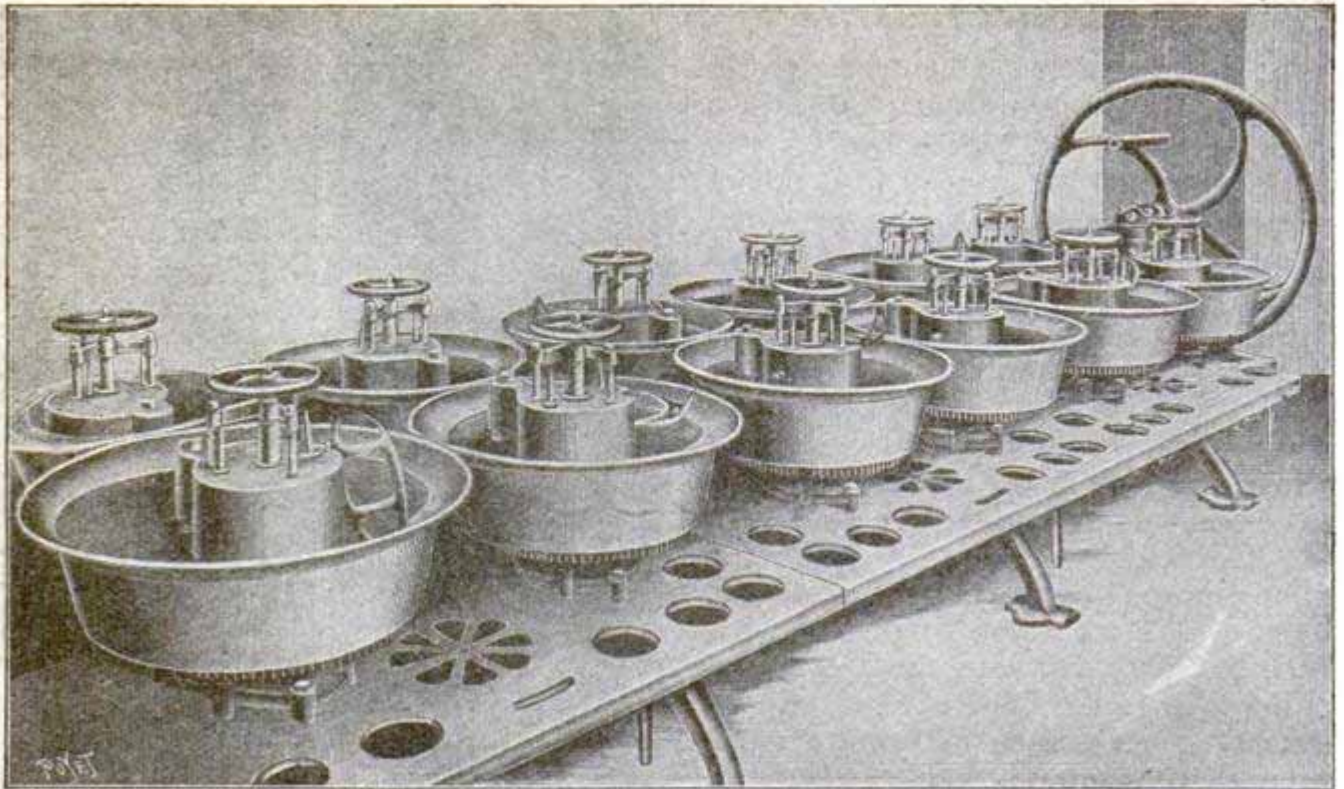


Fog and Fire Safeguards

sengers and crew. The clockwork at the top of the left-hand illustration blows the fog whistle every seven seconds when fog obliterates everything. The simple closing of the switch at the bottom summons all members of the crew to quarters. In the other illustration is an ingenious system of tubes by which it is possible to locate the position of a fire. These tubes lead to different parts of the ship, and should a fire break out, smoke is drawn up through one or another of them by a fan that continually whirls in the case above the tube openings.

## QUEBRACHO TREES IN TANNING INDUSTRY

The quebracho tree, which contains the tannin used in the manufacture of the extract so valuable in the tanning of hides, is a large item of national wealth in Paraguay and Argentina, the trees extending over thousands of square miles. The industry had its origin in France, where a consignment of logs was sent from Paraguay in 1874. The first factory in South America for its manufacture was erected in 1889. Several companies, capitalized at from \$1,000,000 to \$6,000,000, one of which employs about 30,000 workmen in its factories, workshops, and railways, have been in operation for some years.



Flour Testing Machine

Courtesy La Nature

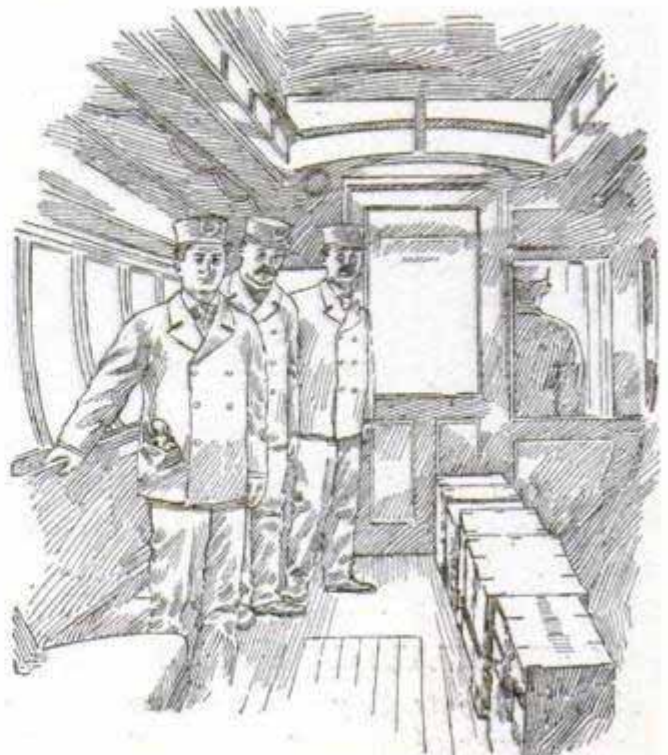
### TESTING QUALITIES OF FLOUR

The general excellence of Paris bread in taste and nutritious value is due to the constant efforts of the syndicate of bakers of that city to get the best quality of flour. In this work the association has a laboratory where tests are made, and of all the devices used the machine shown in this illustration is one of the most important. It is a set of 12 kneading-troughs solidly fixed on a large metal table. All the troughs, which are exactly the same in size and construction, are operated by a shaft turned by the wheel at the end, therefore the dough in each receives exactly the same amount of mixing. Very noticeable differences are thus found in the quantity, as well as quality, of the doughs made from different samples of flour.

Under the rules of the New York building inspectors, the wood used for booths and stands in outdoor celebrations must be fire-proofed. A pushcart vendor of kindling wood sold a number of carefully prepared bundles of such wood on New York's East Side recently, to the consternation of the innocent buyers.

### STREET CAR LOAD OF MONEY

The City Railway Company of Chicago has four stations along its lines where the conductors report and deposit the fares collected on each run. Once a day, except Sundays, a street car, not unlike ordinary cars in appearance, but armored with steel, makes a visit to these stations and col-



Fares of a Million Rides in One Car



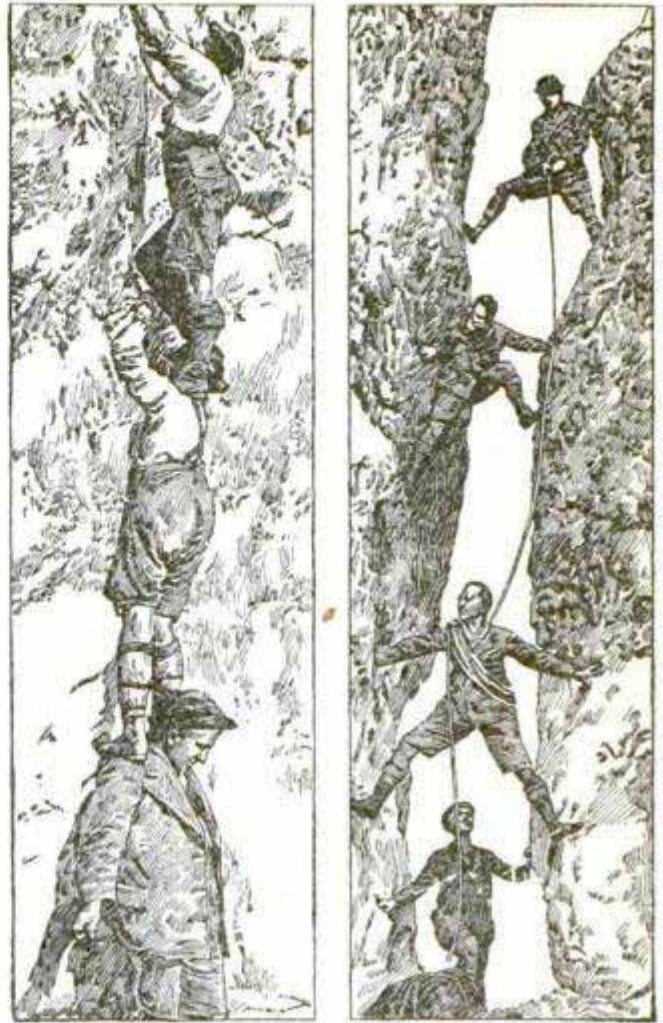
lects anywhere from \$60,000 to \$80,000 in actual money on all days but Monday, and something like \$160,000 to \$180,000 on that day. This great amount of money is all in heavy steel chests guarded by a picked and well-armed crew.

### JAP ARMY TO HAVE MEAT

The Japanese, for centuries a rice-eating nation, have taken to eating meat, and the army, which won the war with Russia on a diet of rice and fish, is to have a meat course added to its meals. The head of government cattle department has been in Europe for some time buying stock for the army.

### BREATHLESS MOMENTS IN MOUNTAIN CLIMBING

That mountain climbing is an amusement in which sure-footedness means success, and carelessness death, is graphically borne out by these pictures of two breathless moments in the ascent of a peak in Switzerland. People who shudder at the idea of ever riding on flying-machines would prob-



A Careless Step Means Death

ably prefer even such airy means of ascent as compared to these.



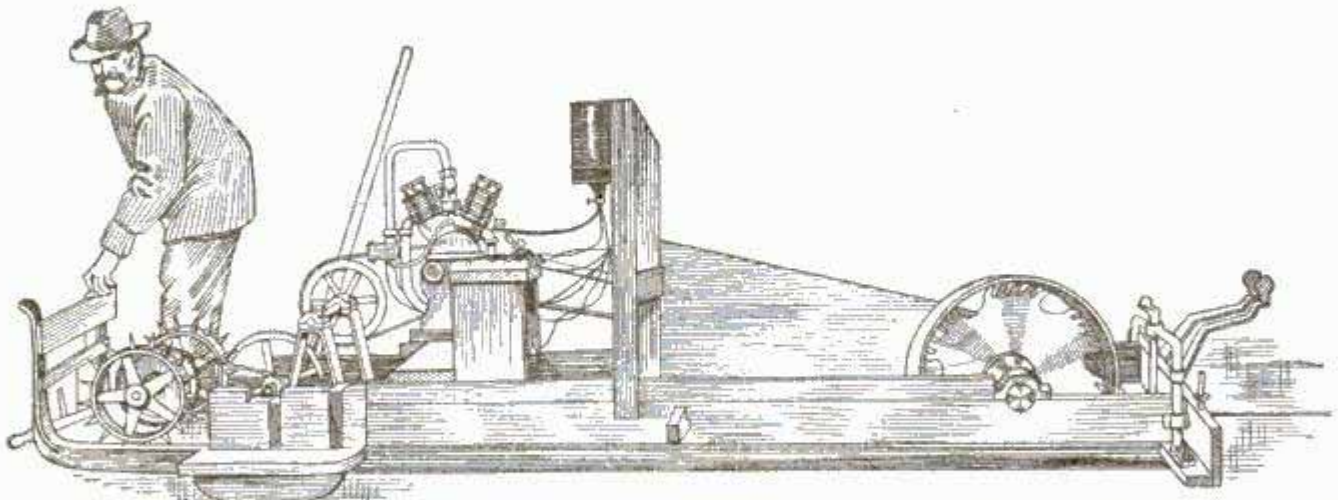
Entrance to Harbor, Sydney, Australia, Where Many Ships Have Been Wrecked



Santa Claus Up to Date

### MOTOR-DRIVEN ICE CUTTER

The self-propelled ice-cutting machine shown in this illustration was tried out last winter with great success on the River Spree, Germany. It cut ice 8 in. thick with great rapidity, and its only disadvantage was that it could not be used on ice of a thickness of less than 5 in. because of its weight of 850 lb.



German Self-Propelled Ice Cutter

Courtesy Ice Trade Review, London

The machine is built like an ordinary motor sleigh, the only difference being in the addition of the circular

cutting saw at the rear. The toothed traction wheels are in front and the engine is in the center. A broad belt, protected by a box, transmits the power from the motor to the saw.

### GLACIERS THREATEN ALASKAN RAILROAD

Professors of the universities of Wisconsin and Cornell, who led a geological expedition to Alaska, report that one of the largest glaciers in the Prince William Sound District is advancing into the forest and destroying it absolutely. Also that the glaciers Miles, Childs, and Baird, around the mouth of the copper region, are advancing into the Copper valley. The Copper river flows between them, and it is over this stream and around the glaciers that the line of the Copper river & Northwestern railroad must pass. If the glaciers continue to advance, the maintenance of the road at this point may be an expensive undertaking.

### FREIGHT-CAR CONSIGNEES PAY HIGH FOR SLOWNESS

A law went into effect in California last July which requires a charge of \$6 per day demurrage on intrastate freight cars not promptly unloaded by consignees. The reason of this law is to

dispel, as far as possible, the car shortage, and the first month showed a considerable reduction in the time re-

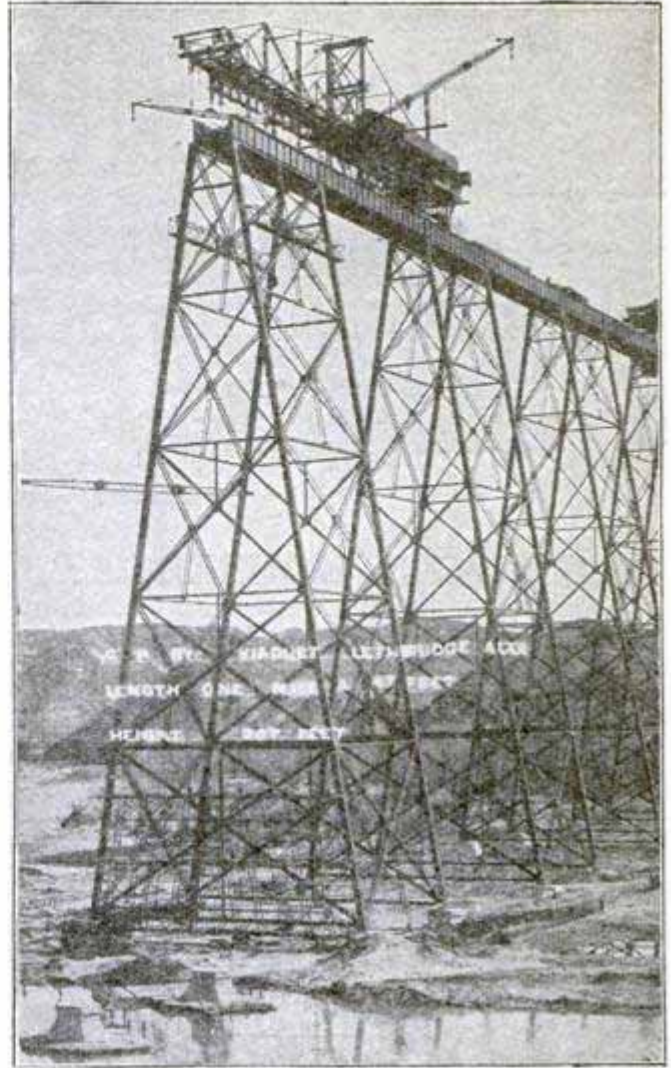
quired for unloading, although many consignees paid the penalty rather than release the cars.

The average detention was reduced to 3.58 days per car, whereas on interstate shipments, to which the one-dollar rate still applies, the average detention was 5.91 days. Of the 75,654 cars reported by the California agencies as subject to this rate of \$6 per day, 916, or 1.21 per cent were held beyond the free time, while of the 18,311 cars subject to the one-dollar interstate rate, 1,136 were so held.

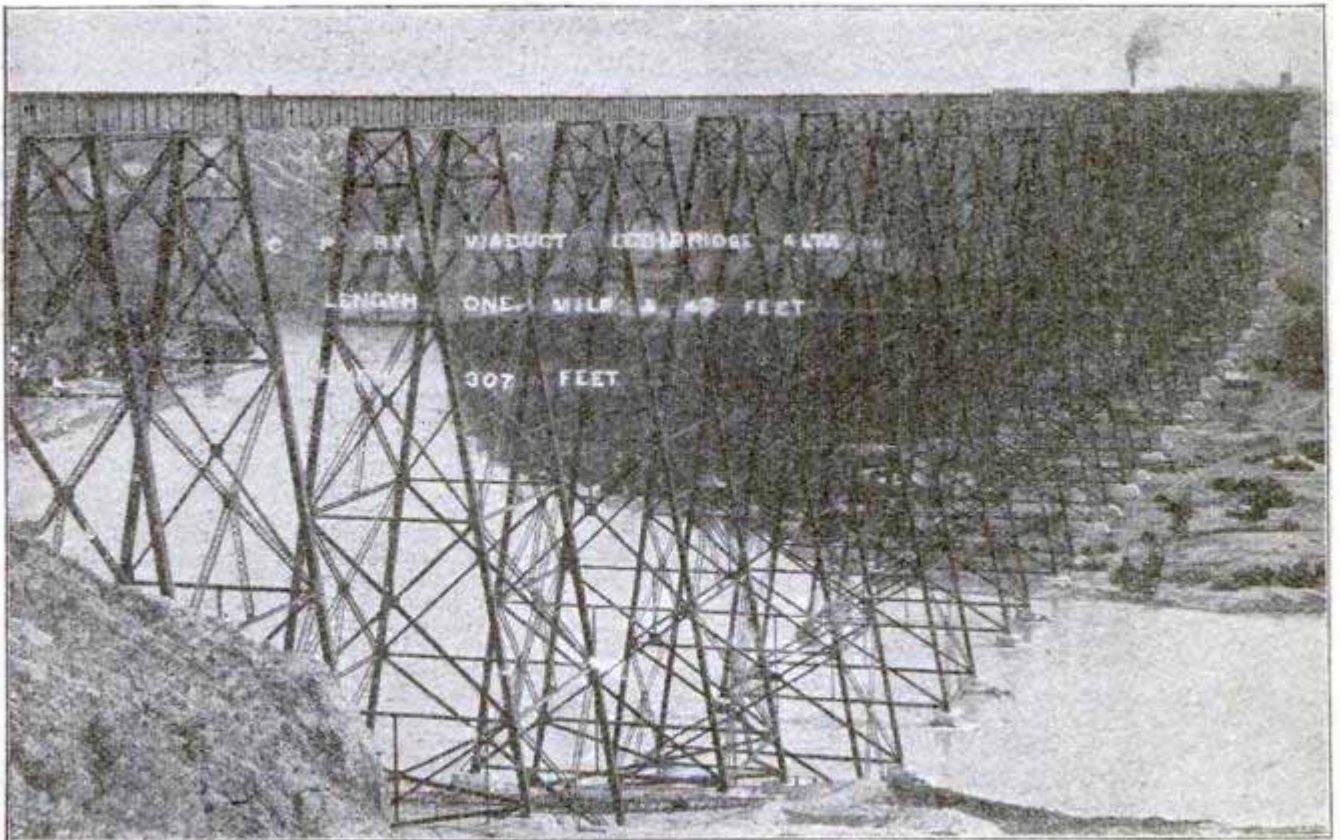
### GREATEST RAILROAD BRIDGE IN CANADA

The new railroad bridge of the Canadian Pacific line, forming a short cut into the town of Lethbridge, Alberta, is considered the greatest in Canada in many respects. Its length is a little more than a mile, and its height above the surface of the water is 307 ft. The bottom width of the steel supports is 100 ft., and the top 25 ft.

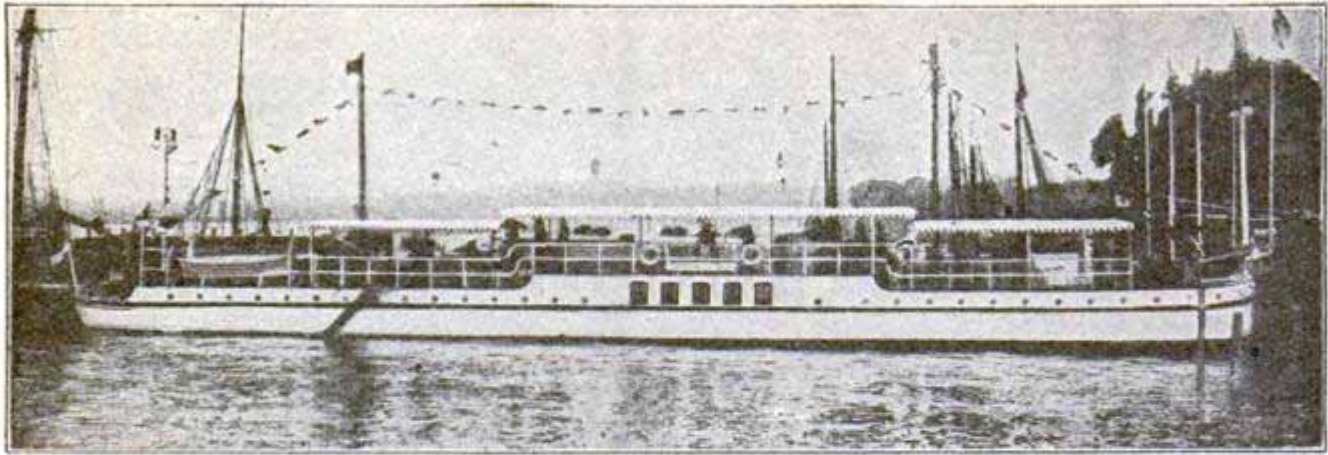
The illustrations show the bridge under construction and finished.



Bridge Building 307 Ft. in the Air



Appearance of Completed Bridge

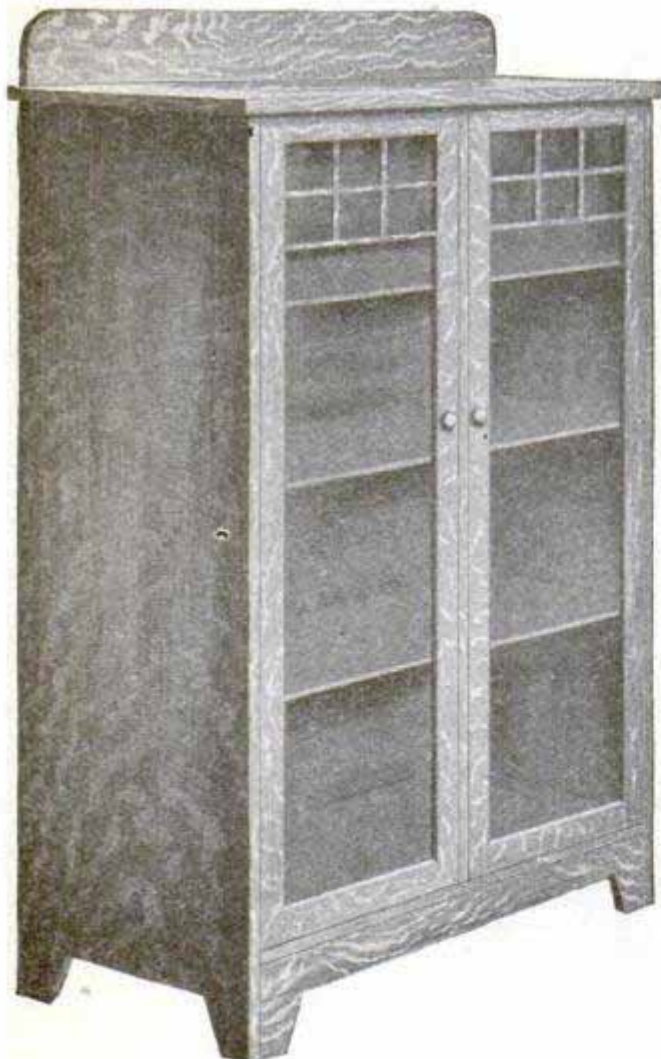


Floating Residence in Germany

## GERMAN HOUSEBOAT OF EXCELLENT DESIGN

The German houseboat here shown is larger than the usual type of American houseboat, and has her deck and upper cabins arranged somewhat along the lines adopted for the larger types of cruising motorboats, instead of being

built up in box form. She is a popular type on the sheltered waters of Germany and forms an ideal summer residence. The engine is small, but of sufficient power to enable her to move about slowly from place to place.



Bookcase Completed

## HOW TO MAKE A MISSION BOOKCASE

This beautiful piece of mission furniture can be made at a very moderate cost by anyone who has a slight knowledge of tools. Considerable labor can be saved by ordering the material from the mill ready cut to size, dressed and sanded. Quarter-sawed oak is the best wood to use and it is comparatively easy to obtain. Plain-sawed oak looks well, but is more liable to warp than the quarter-sawed and this is quite an element in pieces as wide as the ones used. For the complete bookcase the following material will be needed:

- 1 top,  $\frac{3}{4}$ x15x31 $\frac{1}{4}$  in. hardwood, S-1-S.
- 1 top back board,  $\frac{3}{4}$ x4x30 $\frac{3}{4}$  in., hardwood, S-1-S.
- 2 sides,  $\frac{3}{4}$ x14x50 in., hardwood, S-1-S.
- 1 bottom,  $\frac{3}{4}$ x14x28 $\frac{3}{4}$  in., hardwood, S-1-S.
- 1 bottom rail,  $\frac{3}{4}$ x4x28 $\frac{3}{4}$  in., hardwood, S-1-S.
- 1 center piece  $\frac{3}{4}$ x2x45 $\frac{3}{4}$  in., hardwood, S-2-S.
- 4 door sides,  $\frac{3}{4}$ x1 $\frac{1}{2}$ x45 $\frac{3}{4}$  in., hardwood, S-2-S.
- 4 door ends,  $\frac{3}{4}$ x1 $\frac{1}{2}$ x14 in., hardwood, S-2-S.
- 4 pcs. door lattice,  $\frac{1}{2}$ x $\frac{1}{2}$ x12 $\frac{1}{2}$  in., hardwood.
- 4 pcs. door lattice,  $\frac{1}{2}$ x $\frac{1}{2}$ x7 in. hardwood.
- 2 bottom cleats, 1 $\frac{1}{4}$ x1 $\frac{1}{4}$ x13 in., softwood.
- 2 top cleats, 1x1x12 $\frac{1}{2}$  in., softwood.
- 3 shelves,  $\frac{1}{2}$ x12x28 $\frac{1}{2}$  in., softwood.
- 12 pcs. backing,  $\frac{3}{8}$ x4x29 $\frac{3}{4}$  in., softwo d.
- 4 hinges.
- 2 door handles.

Begin with the sides by cutting them so they will pair up all right. The front edges are rounded while the back

edges are rabbeted on the inside as deep as the backing to be used. The bottoms are cut as shown in the sketch. Holes about  $\frac{1}{2}$  in. deep should be bored on the inside at the proper places for the wooden pegs which hold up the shelves.

The top and bottom boards should have the front edges rounded and sanded the same as the sides. The top board is sanded on one side only and care should be taken to get the best side up.

Now cut and fit the top back board. This is fastened to the top by means of screws. Screw two cleats to each of the sides as shown and by running screws through these into the top and bottom boards the frame is completed.

The backing which can be made of some cheap lumber is now put on. Next put in the center upright piece between the doors by means of a tenon and mortise at the top and nails at the bottom. The front edge should be rounded and the edge and sides sanded. Cut and fit the bottom rail as shown. It is fastened to the frame by means of cleats on the back side.

The doors are put together by means of a tenon and mortise. They should be rabbeted for the lattice work and the glass. This lattice work can be omitted and leaded glass put in its place which is very becoming to this kind of work.

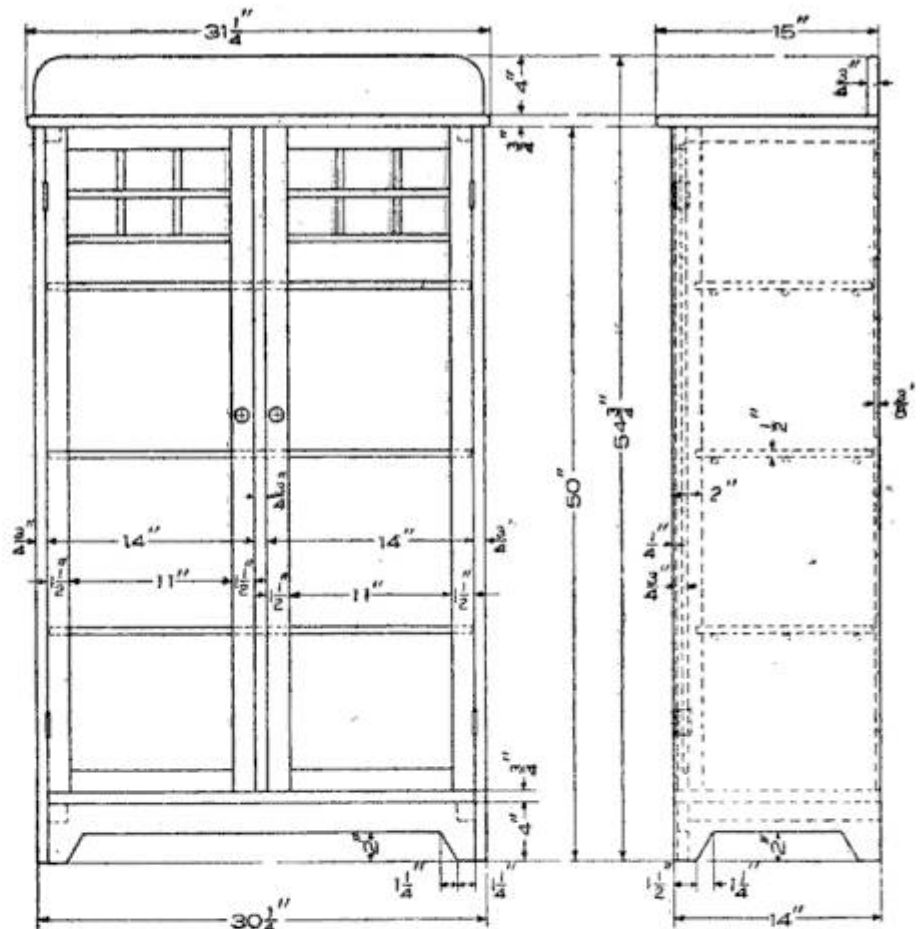
When the case is completed it must be carefully gone over with sandpaper before any finish is applied.

A mission stain is suitable for work of this kind, but it can also be finished in "golden oak" which is done in the following manner: First put on a golden oak stain and after it has dried

for about 2 hours apply the filler. Let this dry about 10 minutes then rub off with an old rag. Then go over the case again with some very fine sandpaper and after seeing that all parts are free from dust and dirt the varnish can be applied. Three coats of varnish will give a beautiful glossy finish.

### CONCRETE BUILDINGS IN CHINA

Many buildings in China are constructed of concrete, but it is an industry especially peculiar to the port of Swatow. The use of concrete, according to Albert W. Pontius, U. S. consul at that port, was instituted several hundred years ago, and the absence of any buildings or walls of brick is conclusive proof of its stability and lasting qualities.



Details of Bookcase Construction

Very small pebbles or shale and lime are the ingredients of which the material is made. The mixture, after being thoroughly incorporated, is slightly moistened, and then pounded

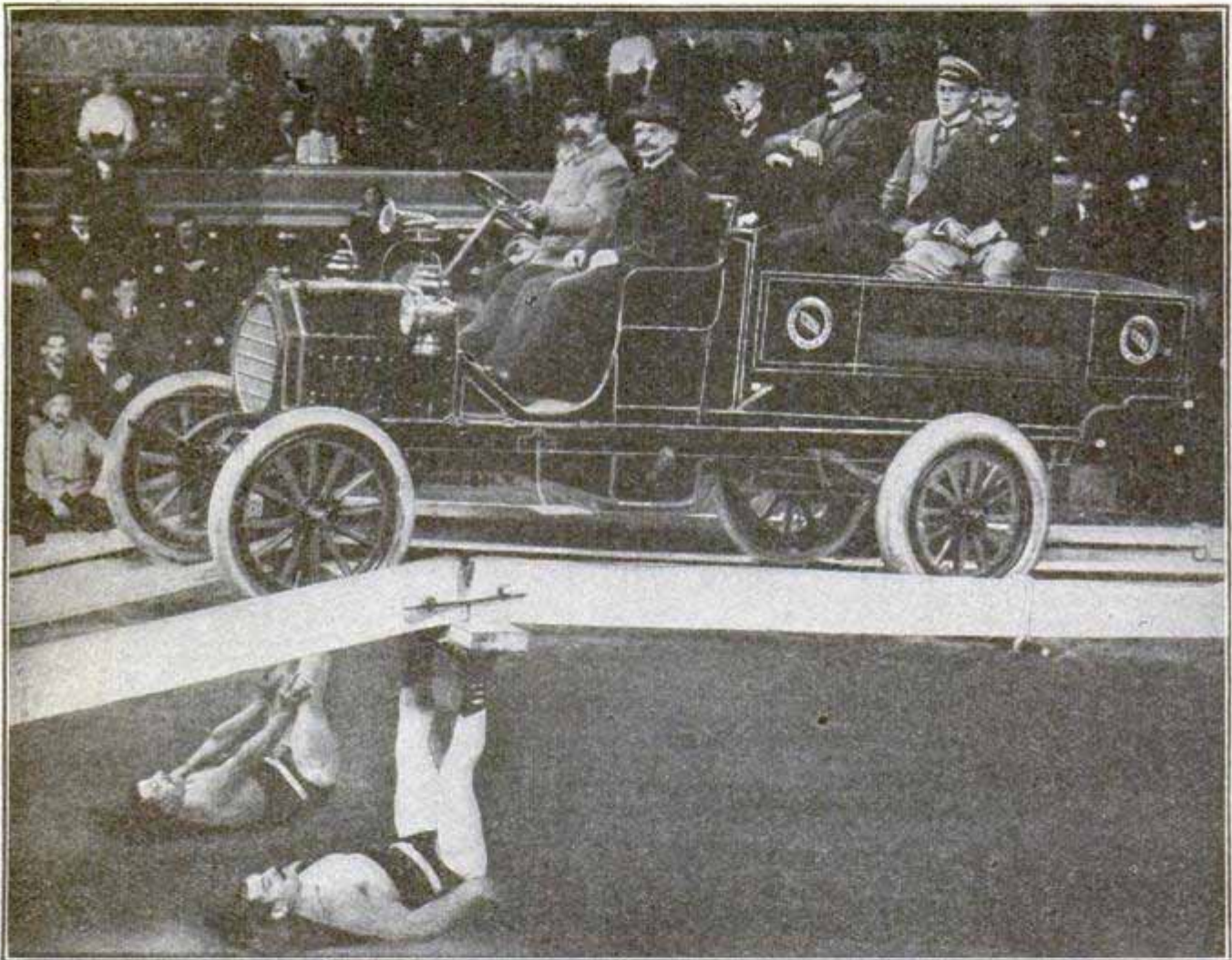
in a rough wooden mold which is elevated in a runway supported by firmly set poles. In spite of the crude methods employed, a height of 60 ft. can be easily reached. The walls vary from 12 to 16 in. in thickness, and the cost of construction is considerably less than brickwork.

In some instances split bamboo poles have been used to reinforce the material. Bamboo, imbedded in the concrete in this manner, does not rot. Steel or iron reinforcing, owing to the added expense, is never used.

in which five persons are riding, is driven.

### SIMPLE STERILIZATION OF WATER

The French academy of sciences has announced the discovery of a purely physical and very simple process of purifying water. The only requirement in the purification is the placing of a "Kromayer" quartz lamp, emitting vapors of mercury through which passes an electric current, in the water.



An Up-to-Date "Strong-Man" Trick

### INTERESTING "STRONG-MAN" NOVELTY

The illustration shows a novel "strong-man" trick which interested many people in German cities where the performances were given. Two strong-men, lying on their backs, hold up upon the bottoms of their feet a runway over which a large automobile,

In one minute, owing to the ultra-violet rays it is said the water is completely sterilized. It has not been altered, nor heated.

Such lamps, permanently installed in the piping through which the water runs, according to the report, will secure complete purity. The lamps last indefinitely, the expense is small, and inspection easy.

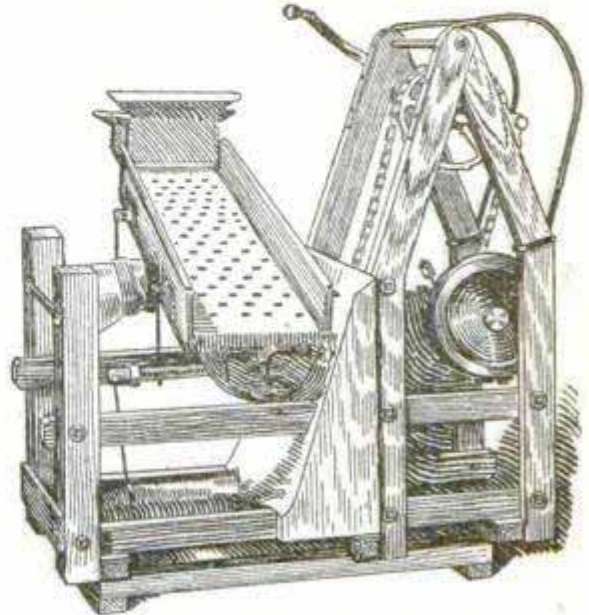
## PLACER MINING APPARATUS

Placer gold is found in gulches in gold-bearing mountains and in places where it has been washed by water. This is recovered from the gravel or other soil by means of either wet or dry washers, the former being the oldest and most used method. The first illustration shows a hand-made type of wet washer or rocker that can be made by anyone. The "pay gravel" is placed in this washer and, by means of rocking, the gravel or sand is washed down the riffleboard by the water, the gold settling in the riffles and carpets.

The second illustration shows a hand-made washer of the dry type, now being used in localities where water is scarce. The screened "pay gravel" is dried thoroughly and then placed in the machine. As the gravel runs down the riffleboard, wind, made by a bellows, is blown against it from underneath. The gold, being heavier than the sand, is caught in the riffles, while the sand is blown away.

The third illustration shows a newly patented dry washer, designed for desert placering. The bottom of its sluiceway contains a series of riffles, which are the vital part of the invention. Instead of projecting above the surface of the sluiceway, as in most sluice boxes, they consist of a series of depressions. Each depressed riffle or pocket is straight across at the upper edge, sloping at the sides, and

curved at the lower edge. The bottom of the pocket so formed slopes in the opposite direction to the inclination of the sluice. The metal lining forming



Recently Patented Dry Washer

the bottom of each pocket is continuous at its lower edge with that of the sluice, but terminates at the upper end at a point vertically below the upper edge of the pocket, and the opening thus formed in each pocket is covered with a fine wire screen.

Under the sluiceway is a chamber, airtight except for the screen-covered openings of the pockets, into which the air is led by the blowing apparatus. This air, escaping through the upper opening in each pocket, effects an



A Wet Gold Washer or Rocker

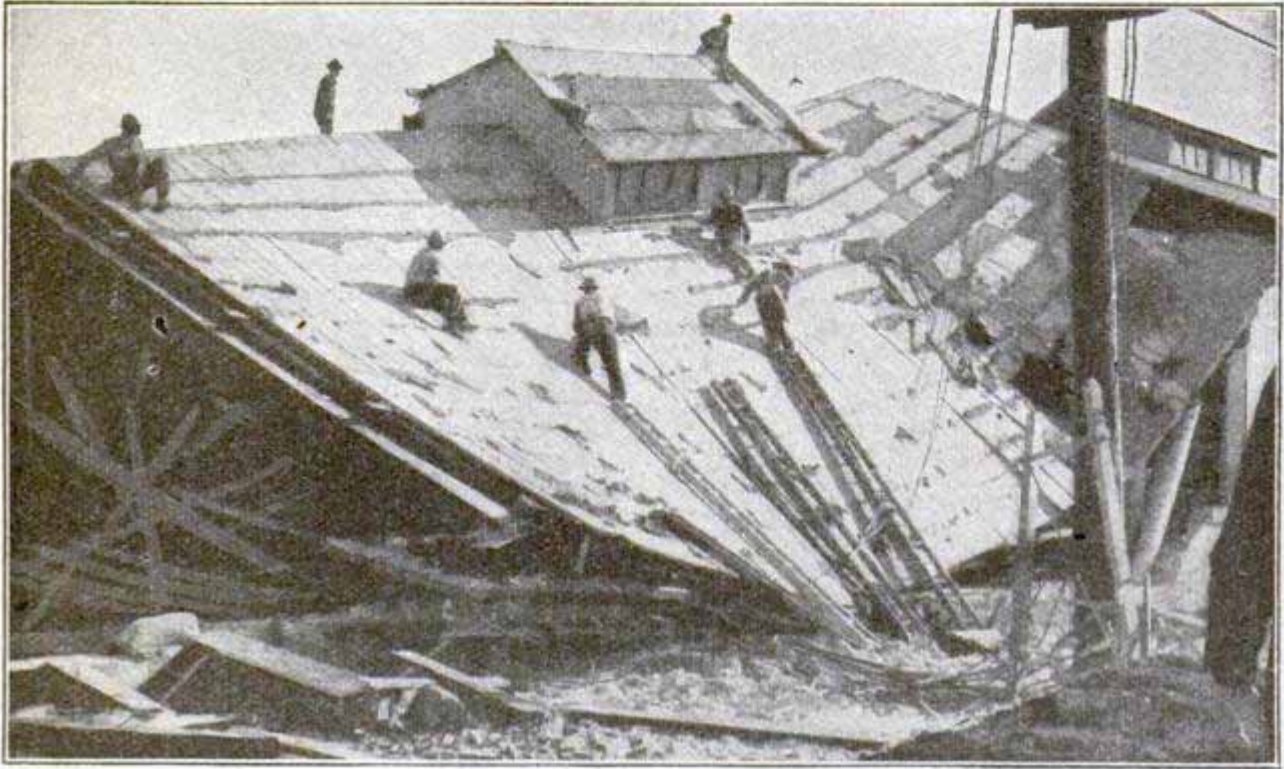


Hand-Made Air Washer

agitation of the gold-bearing material, forcing all the lighter soil to the top. This is allowed to run down the incline and is dumped, while the gold remains in the pockets. The one crank operates both machine and blower.

### SPRING AUTO WHEEL OF ENGLISH MAKE

Although the past few years have seen hundreds of inventors come forward with as many different kinds of



Result of Twister in Upper Michigan

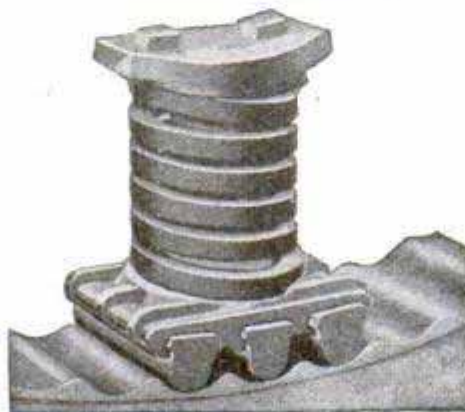
### MILL WRECKED BY CYCLONE

The photograph shows part of the roof of a factory at Ironwood, Northern Michigan, after a cyclone had struck it. The force of the wind lifted the entire roof off the building, tore it into sections, and carried these sections in all directions. The brick walls of the structure were also leveled to the ground, wrecking the greater part of the machinery.

spring wheels to supplant the pneumatic tire, none of them has as yet proved practical and efficient enough for general use. This spring wheel, however, of English make, is drawing considerable attention from European auto manufacturers. The method of utilizing its 16 springs is shown in the illustrations. The springs are not solidly attached to the wheel rims, but set in grooves.



Wheel-Center with Springs in Place



Close View of a Spring



Action of the Springs Under Weight of Car





Negro Recluse and Coffin House

### HOUSE PATCHED AND FURNISHED WITH OLD COFFINS

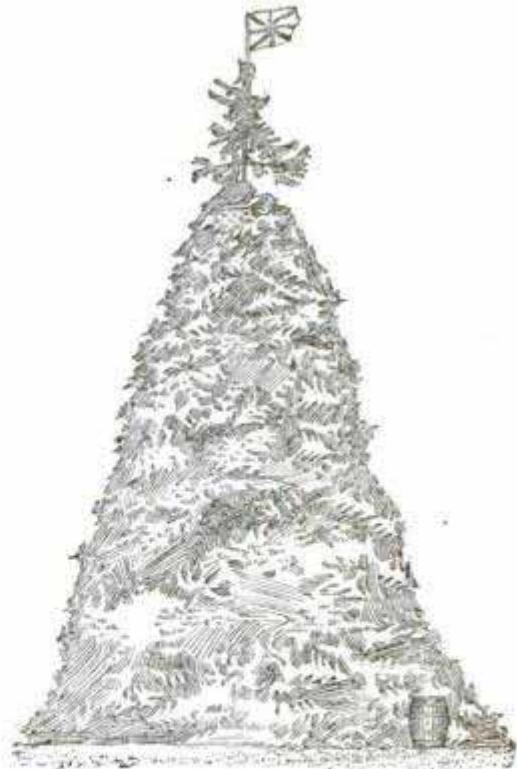
The accompanying illustration shows an old negro recluse of Old Town, a community near San Diego, California, and his habitation, claimed to be the most gruesome house in all California. The doors are formed of casket lids, and the interior is furnished with graveyard relics. The bench upon which he eats is an old coffin lid, and his bunk is a coffin box. On the four walls are nameplates that once were parts of the coffins of Old Town citizens, and here and there panels from broken coffins have been used to make the house tight from wind and rain.

Rafael is the only name the recluse knows, and he has also forgotten his age. Just how he came by the gruesome relics no one seems to know and he has never been found taking anything from the graveyard in recent years. In all probability the parts of coffins his home contains were washed out of the ground many years ago when graves were more shallow and less protected than at present.

Old Town was founded in 1769 by Father Junipero Serra, and the negro has been there longer than the oldest inhabitant remembers.

### A DUKE'S GIANT BONFIRE

When the Marquis of Stafford, heir of the Duke of Sutherland, came of age recently, a great celebration took place in honor of the event. One of the features of the celebration was the



Bonfire of Huge Proportions

giant bonfire shown in the illustration. It reached the height of an ordinary house.

## FLORAL BOTTLE AS FUNERAL PIECE

A florist at Alton, Ill., was recently commissioned to make this flower bot-



Courtesy Florist's Review

Floral Bottle 5 Ft. High

tle as one of the floral pieces at the funeral of the president of one of the largest bottle factories in the country. It stood 5 ft. high, was 2 ft. in diameter, and the only sign of color was in the carnations representing the cork. The body of the bottle was of white carnations.

Although there were many artistic and beautiful floral pieces at the funeral, this bottle, the tribute of the fore-

men in the factory, drew the most interest and attention.

## WRIGHT MAKES HIGHEST FLIGHTS

Orville Wright, who flew extensively in Germany during the month of September, at times watched by more than 100,000 people and the German royal house, has more than tripled previous height records for aeroplanes. In one flight, in which captive balloons were used to determine the altitude, he reached a height of 765 ft., as compared to Latham's record of about 450 ft.

On a later date, he flew to an altitude which he believes was more than 1,500 ft. high. He arose a great distance above the highest captive balloon, therefore the height cannot be absolutely determined, but he bases his computation on the fact that he steadily flew upward as he circled for 15 minutes.

## RAPID ORE-LOADING RECORDS

The vessel-loading record for the past season on the Great Lakes, if not for all seasons in the history of the ore trade, is held by the Chicago and Northwestern docks at Ashland. The huge lake steamer "W. E. Corey" arrived at the docks at 7 o'clock, began loading at 7.10, and had received its cargo of 10,234 tons and was ready to leave at 8.30. Twenty minutes of this time was used in shifting the boat, the actual time in loading being 63 minutes.

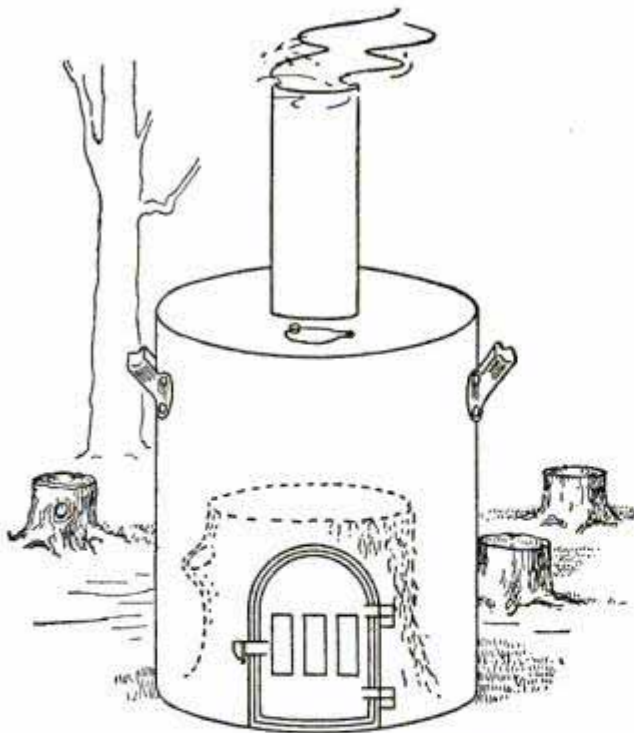
In one day during the season the Duluth, Missabe & Northern railroad hauled no less than 136,000 tons of ore. Reckoned by the average train-load of ordinary traffic, this tonnage represented a train nearly 50 miles long.

The steamer "Minnesota" recently carried the most valuable cargo ever transported across the Pacific. It consisted of \$4,000,000 worth of raw silk, tea, and hemp.

# SHOP NOTES

## Burning Out Stumps

A satisfactory and inexpensive way of burning out stumps is to place a galvanized furnace, as shown in the sketch, over the stump and allow it to burn at leisure. This furnace is cylindrical and is made of sufficient size to cover the stumps. An ordinary joint of stove pipe is used for the smoke. A door of convenient size is made below to cover an opening that serves as a damper. The stump is covered with kerosene and a fire built near the door between the opening and the stump. The furnace may be turned with the wind, if necessary, to give the fire a strong, steady draft. This contrivance will burn out large stumps in a remarkably short time, leaving nothing but deeply buried roots, and



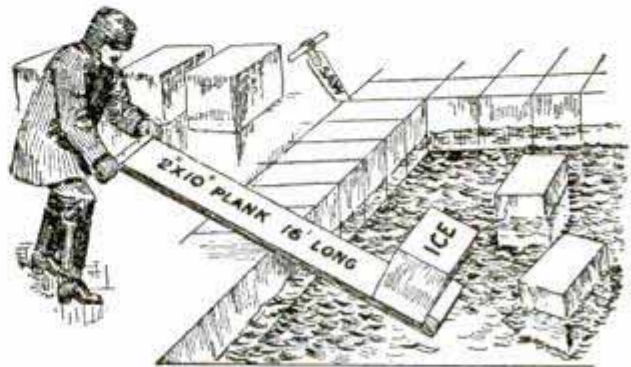
Furnace Sets over the Stump

sometimes the flames will burn these out at a great depth.—M. Wooley.

Never allow the weight of an automobile to rest on deflated tires.

## Removing Blocks of Ice from a Pond

An easy way to take the blocks of ice from a pond after they are cut is



Lifting a Block of Ice

shown in the accompanying sketch. A plank, 10 or 12 in. wide and 16 ft. long, with a handle attached to one end and a block of wood nailed to the other, takes the place of ice tongs. One person can take out a heavy block of ice as easily as three men could with ice tongs. In removing ice blocks with this board, the operator will not get wet.—Contributed by L. R. Clarke, Elmhurst, Calif.

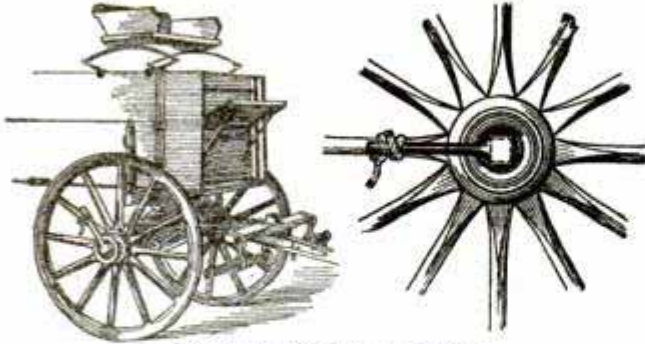
## A Handy Milk Bottle Opener

A great deal of trouble is often experienced in taking the paper tops out of milk bottles. The little instrument here shown will do the work very nicely. Secure an ordinary fish hook about 1½ in. long and after heating it to a red heat bend it out straight as shown. Run the barbed end through a cork and this will serve as a handle. To use, pierce the paper cap with the hook so that the barb will catch on the under side when the hook is withdrawn and the cap will come out with the hook.—Contributed by Ralph L. LaRue, Goshen, N. Y.



### Turning a Tight Wagon Wheel Nut

A wagon wheel nut that becomes too tight to be removed in the usual

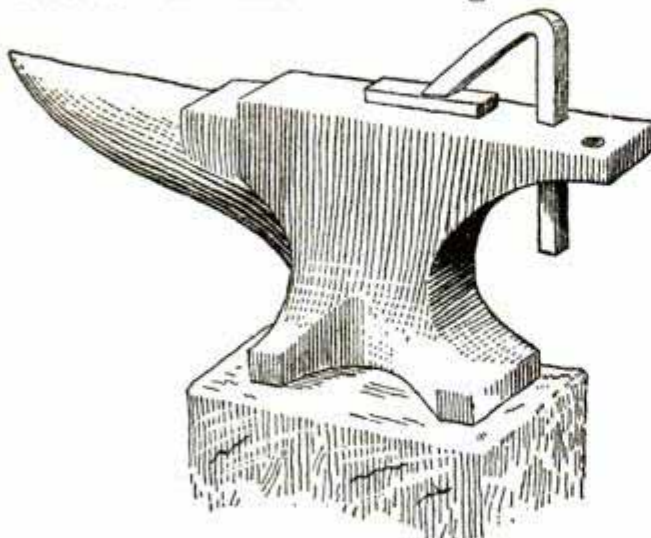


Wrench Tied to a Spoke

way may be loosened by the following method: Put a wrench on and fit it tightly to the nut and then tie a short piece of rope to the wrench handle and to one of the spokes in the wheel as shown in the sketch. Push the wagon backward a few feet and the turning wheel will loosen the nut. The nuts may be tightened in the same manner by pushing the wagon forward.—Contributed by P. A. Harlan, Norman, Nebr.

### A Blacksmith's Holding-On Tool

The blacksmith finds it necessary at times to have someone to hold a piece of metal on his anvil, while doing some work that requires the use of both his hands. An extra person is not always at hand when wanted and this necessitates some device for holding the metal.



Tool in Anvil

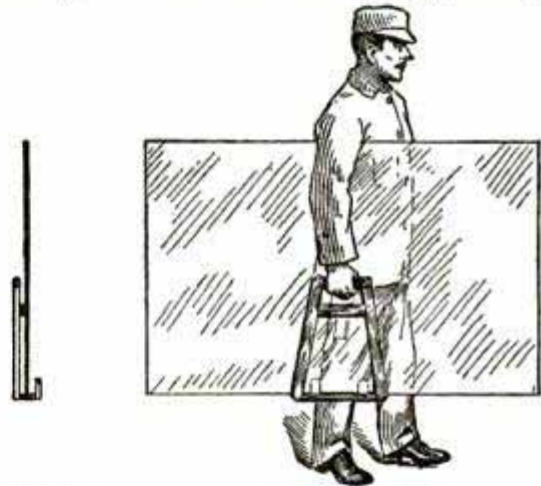
Various appliances are used for this purpose, but the one illustrated herewith is simple to make and holds the

metal well. The device consists of a square piece of steel bar of a size to fit the square hole in the anvil nicely and bent as shown.

When the square steel is driven down with a few blows, it binds in the hole and the spring of the metal will hold the work firmly to the anvil. A blow or two from a hammer on the bottom end releases its hold.—Contributed by John A. Cook, Birmingham, Ala.

### Handle for Carrying Large Window Glass

A window glass that is wider than the length of a man's arm, say, 28 by 32



End Section

Carrying Glass

in., is very hard to manage or carry by one person. The sketch herewith shows a little device I use for this purpose. It consists of a light wood frame with a handle at the top and a projecting piece at the bottom. A small cleat is nailed to the inside of the frame to press against the glass and hold the handle out far enough for it to be easily grasped by the hand.—Contributed by W. E. Morey, Chicago.

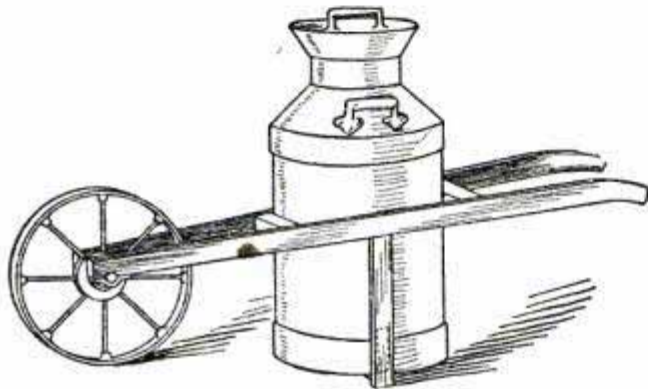
### How to Lay a Large Rug

You are always telling the people about wrinkles and I am going to tell you how to get rid of them. When you lay a large rug you will take hold of the edge and pull away from the center obtaining nothing like first-class results. When a large rug is laid on a stage a stage hand will begin at the

center and sweep it with a broom toward the outer edge, removing the air beneath which will leave the rug as smooth as the floor. I have seen housekeepers try for some time to straighten rugs on oiled or polished floors and when I showed them our way they declared it the best they ever tried.—Contributed by W. H. Dilger.

### Truck for Milk Cans

The accompanying sketch shows how an old wheelbarrow may be converted into a truck for carrying large milk cans. The body of the wheelbarrow is removed and pieces put in to hold the can. One man can handle



Can in the Truck

a 100-lb. can with this truck much easier than two men in the usual way.—Contributed by Chas. J. Allen, Bayonne, N. J.

### How to Remove Dents from Gun Barrels

Secure a piece of gas pipe about 4-in. long and as near the diameter of the bore of the gun as possible and smooth up the outside with a file. Cut the pipe in two, lengthwise, with a hacksaw and file a slight taper on the inside of the pieces with a round or half-round file. Fit a hardwood plug slightly tapering to the pieces, making it 2 in. longer than the pipe.

Locate the dent in the barrel and place the pieces of gas pipe so one half piece will cover it and carefully insert the wood plug. When the pieces tighten against the walls of the barrel, drive the plug in with a heavy rod until the dent is forced out. Take a small

smooth faced hammer, or, better still, a copper hammer and strike with light blows around the dent to smooth up



Wood Wedge in the Pipe

the surface. The gas pipe and wedge is then removed by driving from the opposite direction.—Contributed by W. C. Cleveland, Utica, N. Y.

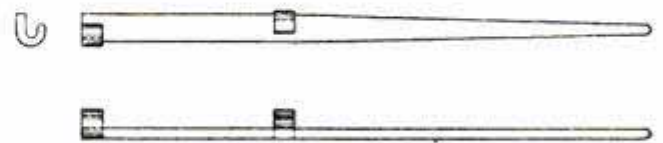
### How to Prevent Friction Tape from Unraveling

Electricians often have trouble with friction tape because the outer edges unravel when the tape is unrolled. This can easily be overcome by scoring each side of the tape in radial lines with a sharp knife as shown in sketch. This cuts the outer threads of the tape and does away with the unraveling.—Contributed by H. S. Lee, Topeka, Kan.



### Extension Bar for Wrenches

A handy extension bar for wrenches is shown in the accompanying sketch which will be found very useful on heavy work where the ordinary open end wrench will not start the nuts. It can also be used on bars when a longer leverage is required. It is 3 ft.



Longer Leverage for Wrenches

6 in. long and made of  $\frac{3}{4}$  by 2 in. steel. Contributed by Urban A. Towle, St. Albans, Vermont.

### Tool Box for Metal Workers

It is useless to provide stove men with a kit of tools unless they are also

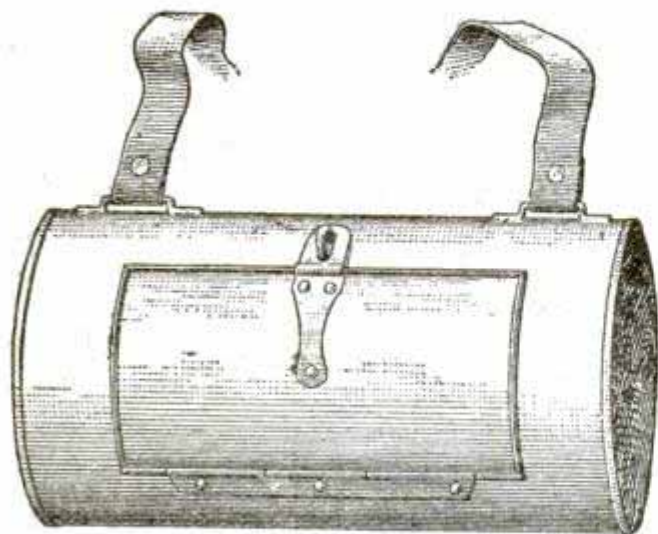


FIG. 1

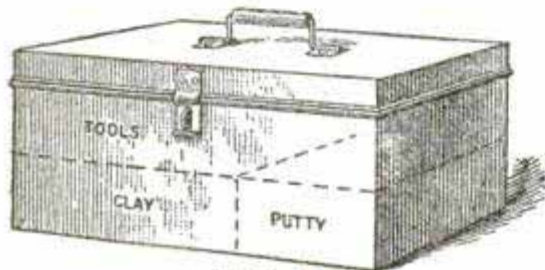


FIG. 2

Two Kinds of Tool Kits

provided with a suitable tool box or tool case, with a clasp to use a padlock to insure them against having any of their tools stolen, says a correspondent of the Metal Worker. Such a tool box is very easily made, and many men use an oval cylinder with a head on each end and a door on the side with a handle on the top by which it can be readily carried; and possibly rings in each end with a strap fastened so that the tool kit can be carried with both hands free for carrying stove pipe or a step ladder, as the case may be.

Some people use a round, others an oval, cylinder as shown in Fig. 1. The box or case should be large enough to carry all the necessary tools, but should not be so large as to permit the carrying of so many tools that it will be a burden, or to relieve the jobber of thinking what he will need for the various work which he is sent out to do, in which case he can remove the tools he does not require and can put

in those which he will need for some special work. Another style of box is shown in Fig. 2.

Stove repair jobbers should also have drawers in the shop where they can keep their tools which are not in their jobbing case.

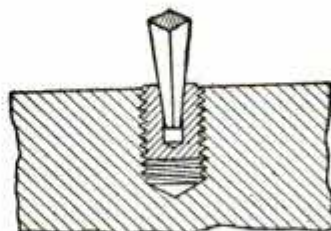
### Black Oil Finish on Steel

Many articles are found in the market with the black oil finish. It is also known as the burnt oil finish. This finish is quite extensively used on hardware, particularly mechanics' tools, like wrenches, chisels, pliers and similar implements. While there are several methods of producing this finish, one of the best is the following:

The article to be finished is heated in a furnace to cherry redness, and then plunged into oil (preferably lard oil). The article is then removed and the oil burned off in the furnace, says the Brass World. After this has been done it is immersed in water. The oil must be kept cold when a large number of tools are to be treated, as the heat will cause it to burn. After the immersion in water, the surface will be found black and protected against rust. In order to bring out the best surface, a light film of linseed oil is applied to the article, and the excess then wiped off.

### How to Remove Broken Screws

Most mechanics do not like the task of removing the ends of bolts and screws that have been broken off in the metal and they will usually try to chip or drill them out, thus spoiling the threads more or less. A much

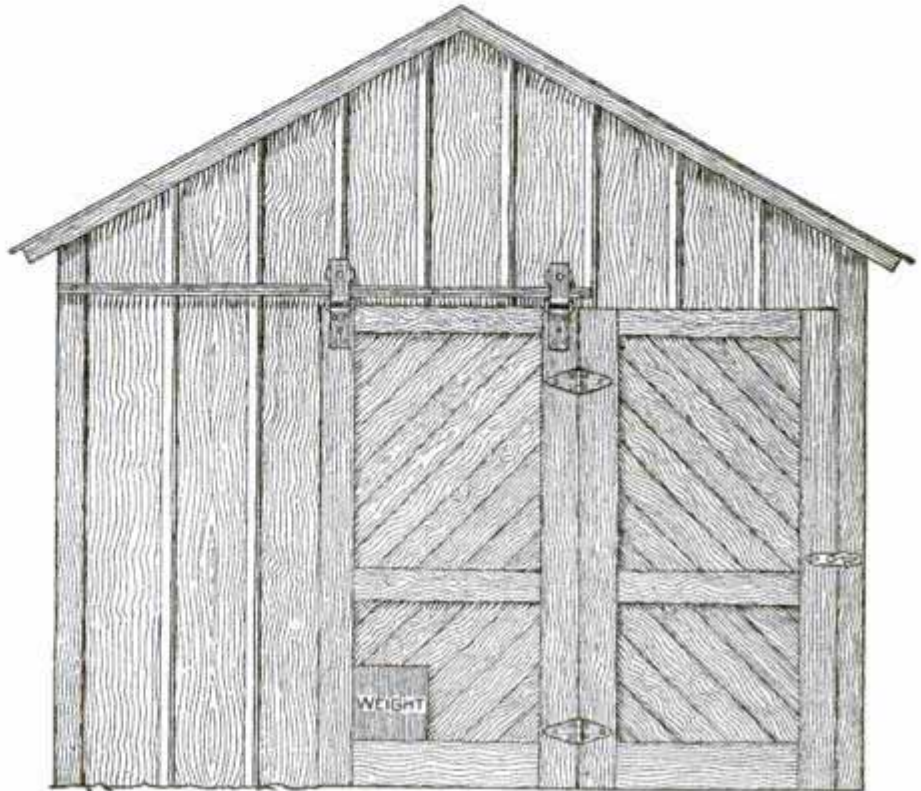


better and easier way is shown in the accompanying sketch. Drill a small hole in the stub and drive a square punch into it as shown. Now turn the punch with a wrench and the stub and punch will turn out together.—Contributed by Wm. Schoenberg, Chicago.

### A Wide Garage Door Hung on a Short Track

A small garage that is only large enough to house an automobile must have a door almost as large as one end of the building. In such an instance the door was desired to be hung on rollers and the width of the garage would not allow for a track of sufficient length to hang an 8-ft. door in the usual manner. Instead of having one door, two 4-ft. doors were made and hinged together as shown in the sketch. One of these doors was fitted with rollers which run on a short track. The hinged door is opened and folded over the first door and then both of them rolled back over a 4-ft. space.

A 50-lb. weight was fastened in the lower left-hand panel of the door hung on the rollers to counterbalance the weight of the door hung on the hinges. A hook was placed in the cement floor on the inside of the doors at the center to secure them when they were closed.—Contributed by M. E. Tyler, Batavia, N. Y.



Short Track and a Wide Double Door

### A Home-Made Oil Stove Heater

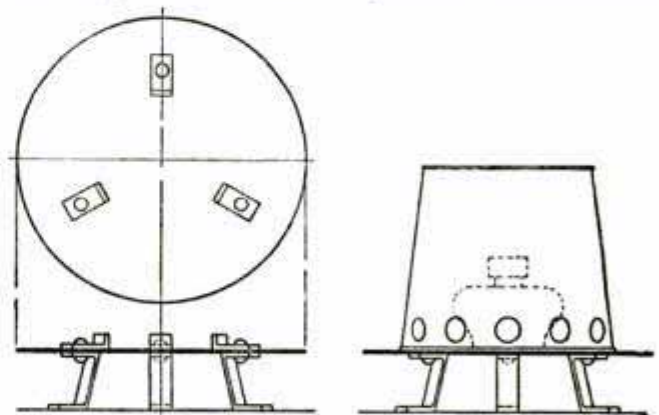
A very simple and easily made oil heater that will give off a surprising amount of heat for its size is shown in the accompanying sketch. The stand

is made of a round piece of sheet iron with three bent pieces of strap iron riveted to it for legs as shown in Fig. 1. The little clips on top are for holding a lamp which should be one with a low base and a large round burner. A large pail with some holes punched in the top and turned upside down over

### How to Temper Springs

Heat the spring to a hardening color, taking care not to burn the metal, and quench in oil. As soon as the metal has cooled so it does not "sizzle" put the spring back into the fire and keep it there just long enough for the oil to burn off, then quench in water.

This method is applicable to all springs, and especially small flat springs. This is a simple method and one to be depended upon and can be done anywhere with a stove fire and a little oil.—Contributed by Donald A. Hampson, Middletown, N. Y.

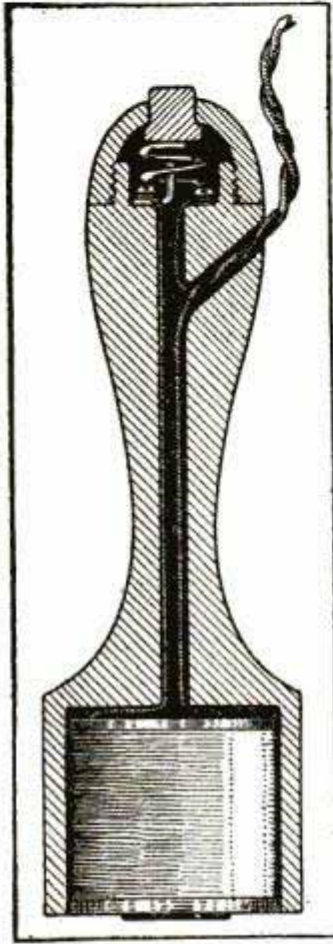


Made of a Metal Pail

the lamp completes the stove as shown in Fig. 2.—Contributed by J. H. Crawford, Schenectady, N. Y.

### Small Magnet for the Shop

In a certain small shop the nails and brads were kept in deep narrow tin cans and they were hard to get, especially when the nails ran low. To overcome this difficulty a small magnet was devised to be operated on a battery constructed of dry cells. A handle  $4\frac{1}{2}$  in. long was turned up from soft wood with one end large enough to bore a hole for the coil of wire. In the other a  $\frac{1}{2}$ -in. hole was bored for a push button and the two holes connected with a  $\frac{1}{4}$ -in. hole for the wires. A double flexible cord of fine wires connected to the magnet coil and



push button entered the handle through a hole in the side and several feet of its length were wrapped around a curtain roller that was fastened to the ceiling. The ends of the wire were connected to the caps on the curtain roller and the copper supports of the roller ends were connected to the battery terminals. The curtain roller keeps the magnet out of the way, yet in reaching distance where it can be grasped by the hand and placed in any can of nails. A pressure on the push button causes the magnet to pick up a quantity of nails and hold them until the button is released.—Contributed by Homer Deakman, Wichita, Kans.

The heat unit value of the volatile matter contained in the various coals has a wide range depending upon the carbon and hydrogen content.

### Handling Frozen Explosives

It is at this season of the year that those in charge of rock blasting should see that the men under them handle explosives properly. With black powder the care ordinarily exercised should be continued. This explosive is not affected by the cold weather, but with dynamite and Judson powder extraordinary care must now be exercised, as these explosives freeze, owing to the nitro-glycerin that they contain.

As the percentage of nitro-glycerin in Judson powder is small, the danger from it is not so great as from dynamite, which contains 33 per cent or more of nitro-glycerin. When Judson powder becomes frozen it will cake in the sack, but it also cakes from other causes. Only a little heat is necessary to allow it to be readily broken up by the hands and placed in the blasting hole. Owing to freezing and thawing free nitro-glycerin can leak from the powder, but not as readily as from dynamite.

In the case of dynamite this is the great danger from freezing, and not only should dynamite that is frozen be handled with the utmost caution, but also that which has been thawed out. The fact is that there is greater danger from the dynamite after it is thawed than when it is in its frozen state, for then the nitro-glycerin leaks from the absorbent used in the dynamite.

Nitro-glycerin in dynamite freezes at a temperature of from 42 to 46 deg. F. When frozen it cannot be easily exploded in the ordinary caps used in blasting, but it is very sensitive to friction, cutting or breaking. The thawing of the frozen dynamite is, however, more dangerous than the handling of it while still frozen. When dynamite is being thawed it begins, as previously stated, to leak nitro-glycerin. This process is generally termed by foremen as "rotting."

Whenever possible to do so, dynamite should be stored in magazines that are heated to an even thawing temperature. If dynamite is exposed to continued high temperatures the nitro-



glycerin will also leak from it. On most construction work it is not economical to build a magazine for storage that is heated, so the dynamite becomes frozen and has to be thawed out.

There are a number of safe ways to thaw out dynamite, but many methods used are exceedingly dangerous, and every winter the public press reports numerous accidents and fatalities that occur from these wrong methods, says Earth and Rock. Adduced are a few "don'ts" that should be observed:

Don't thaw dynamite by an open fire, or by a boiler, or on a stove.

Don't use boiling water or steam to thaw dynamite. Any water so used should never be thrown from the bucket or barrel, but should be poured gently into a hole and covered with earth.

Don't stand sticks of dynamite on end to be thawed, nor should dynamite be stored so that the sticks stand on their ends. Any method of thawing that necessitates the standing of the sticks on end should not be used.

Don't break frozen sticks of dynamite in your hands, but cut them with a cutter made for the purpose.

Don't throw sticks of dynamite about, whether frozen or not, but handle them with the utmost care.

Don't use a penknife in placing your exploders, but buy the tool meant to be used for such work.

Don't use heated stones for thawing dynamite by placing the stones and dynamite in contact. However, heated stones can be used to heat a chamber or box in which dynamite can be thawed.

Don't use a pick or bar to open a case of dynamite, but open cases carefully. A wooden wedge and maul will answer for this purpose.

Don't store caps and fuses with dynamite, nor keep them in the same tool box.

Don't carry caps in your pocket. A number of accidents have occurred in this way.

Don't use an iron bar in tamping your explosives.

Don't thaw more dynamite than you need at one time, as every time frozen dynamite is thawed it becomes more dangerous.

Don't store dynamite that has once been thawed with your regular stock of dynamite, but put it in a separate place so that those using it will know it has been thawed.

Don't let your men decide on the methods they use in handling explosives or thawing them, but see that they use the proper method and understand the danger of the wrong ones.

### Another Way to Drill Holes in Glass

Secure an old three-cornered file the size of the hole desired in the plate and



Fig. 1

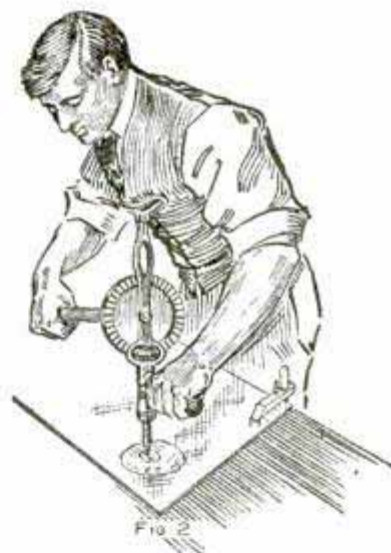


Fig. 2  
Drilling Glass

grind two sides of it to a point as shown in Fig. 1. This file can be put in, held and turned the same as a bit in an ordinary carpenter's brace.

Lay the glass on a smooth surface with a small piece of cloth under the place where the hole is to be drilled. Take some soft putty and make a small ring around on the glass (Fig. 2) and fill the cup-like place with turpentine. Take the brace with the drill and begin boring the same as if boring in wood. Use a slight pressure on the brace and in a short time you will have a clean-cut hole. A hole can be drilled in this way through the heaviest plate glass made.—Contributed by E. L. Kayser, Des Moines, Iowa.

### Testing the Quartering of Locomotive Drive-Wheels

A handy method is here shown of testing locomotive drive-wheels to determine if they are correctly quartered, after pressing them on the axle.

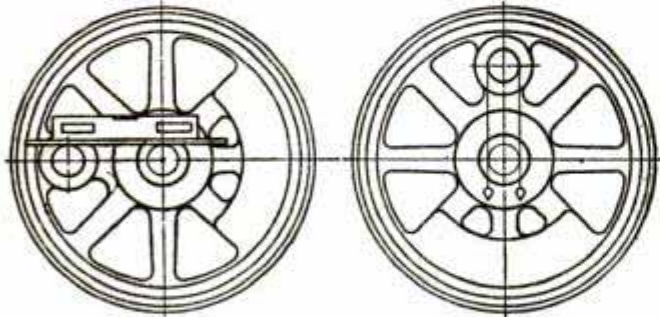
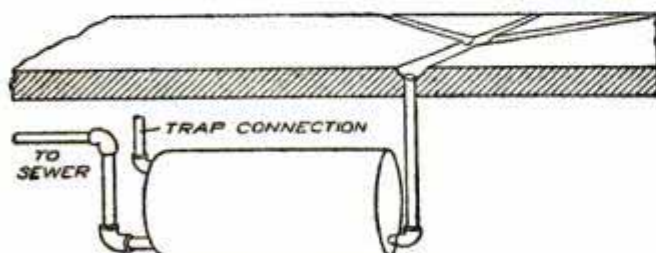


FIG. 1  
FIG. 2  
Quartering the Crankpins

First find the size of the crankpin close up to the wheel and draw a circle of the same size on the end of the axle. Clamp a straightedge on the wheel with one end resting on the crankpin and the other flush with the edge of the circle on axle, as shown in Fig. 1. Put a level on the straightedge and roll the wheels until level, then chock. Now go to the other wheel (Fig. 2) and repeat the process of measuring the crankpin and scribing a circle of the same size on the end of the axle. Drop a thread, with a small weight tied to each end, over the crankpin and if the thread touches the edge of the circle on each side the wheels are quartered correctly, if not, the thread will show how much they are out.—Contributed by R. T. Traylor, Suffolk, Va.

### Saving Oil from Condenser Drips

A novel device illustrated herewith was designed and installed in a large



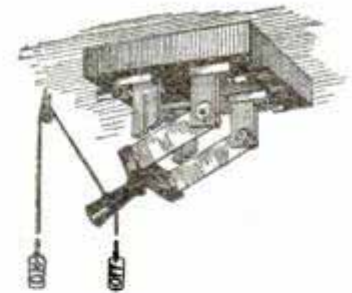
Oil Tank Beneath the Floor

power plant for use in saving oil from the drips, says Practical Engineer.

The basement of the plant has a concrete floor with grooves by which the drip from the various pumps are led to a central drain. The drip flowing in these grooves carries a thin film of oil on the surface and to save this a separator made of an old tank has been utilized. This tank, which is 20 in. in diameter and has a capacity of 150 gal., is placed below the basement floor giving a head of about 3 ft. from the floor drain into the tank. The drainage is carried from a pocket in the floor to the bottom of the tank at one end and at the opposite end, connected to the bottom, is a pipe which goes up almost to the floor level. Passage of the water and oil through this tank is usually so slow that the oil separates out and rises to the top from which it is carried off by a trap. Four or five gallons of oil a day are saved by this device and put back into the engine oiling and cleaning system.

### Hand-Operated Ceiling Switch

As I had no room for an electric switch near my workbench, I put it on the ceiling and operated the throw with two strings long enough to be within easy reach. A small pulley was fastened to the ceiling at the end of the switch block over which to



run the string and give the two motions necessary to throw the switch lever both ways. A tag was attached to the end of each string and one marked "on" and the other "off." This arrangement can be placed anywhere on a wall and the strings run over pulleys guiding them to a point handy for the operator.—Contributed by Fred J. Seyerle, Pittsburg, Pa.

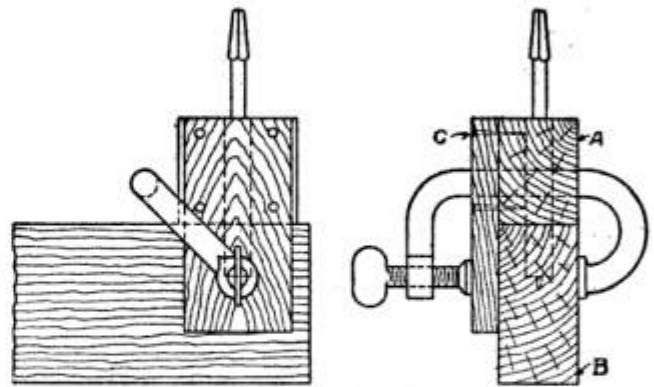
Asbestos pulp is used to a good advantage in the cracks of an old dried-out tank to hold the water long enough for the wood to swell.

### A Tool for Making Mortises

In the construction of mission furniture where mortise joints are mostly used, those who cannot have access to a mortising machine will find the following method of great assistance in obtaining a true mortise, which is necessary in work of this kind.

Take a block of wood, A, the exact thickness of the piece B to be mortised, and with an auger bore a hole, the same size as the width of the mortise to be made, exactly parallel to the sides of the block. This can best be done on a drill press or a wood boring machine. If no machine is available, great care should be taken in boring by hand, to get the hole as nearly true as possible. Then nail a cleat, C, on the side of the block, A, and let it extend down on

piece B. Use a clamp to hold the block in place while boring out the mortise. By changing the position of the block



Boring Holes for Tenons

and boring a number of holes, any length of mortise can be made. The holes should afterwards be squared up with a chisel.—Contributed by W. D. Whitacre, Canton, Ohio.

### Fireplaces That Will Not Smoke

[Condensed from *Suburban Life*]

It is an easy matter to construct a fireplace that will not smoke, although there are thousands all over the country that are constantly giving trouble. To divert the greatest amount of heat into the room and still allow the smoke to escape up the chimney is not a difficult problem, if a few simple rules in regard to the construction of the chimney throat are followed and the proper proportion between the size of the flue and the size of the fireplace opening maintained. In trying to obtain this result with the greatest economy in fuel, complications sometimes arise with very annoying results.

First of all, the chimney should be built higher than the nearby roof ridges, and there should be no tree branches hanging over it to retard the draft. There should also be a separate flue for each fireplace, with no stove connections into fireplace flues. If the chimney is built on the outside of the house, having an outside wall exposed to the weather, there should be a double wall at the back having a 2-in. air space. This will prevent the outside brickwork from cracking when the fireplace is being used during cold weather.

The shape of the fireplace makes considerable difference in the amount of heat thrown out. Splayed (sloping) sides reflect more heat into a room than sides that are at right angles to the front and back. An iron lining to the fireplace will also reflect considerable heat, although it will last only a year or two without being renewed.

In Fig. 1 the best construction for a fireplace is shown; this section being taken at the center of the fireplace through the ash pit below and the center of the flue above. The back of the fireplace inclines forward, starting at a point a little over half-way up the back of the fireplace. The brick arch, either

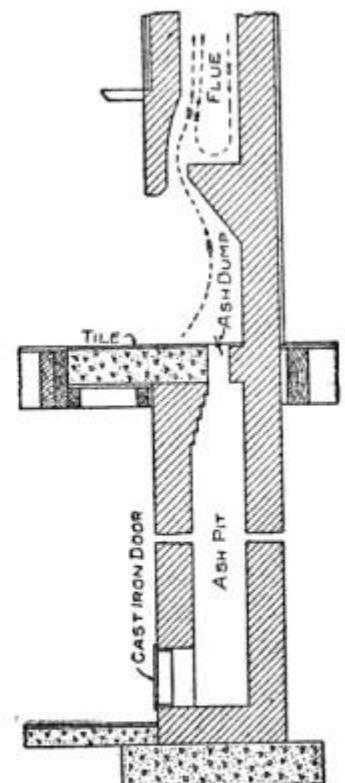


Fig. 1—Ideal Fireplace

The brick arch, either

flat or segmental, has a soffit, which is the width underneath, of about 4 in., giving little surface for the smoke to strike against and reflect into the room. The throat is long and narrow, and as shown in Fig. 2 by the dotted lines, contracts gradually to the center until it is of the same width as the flue at the center, and from

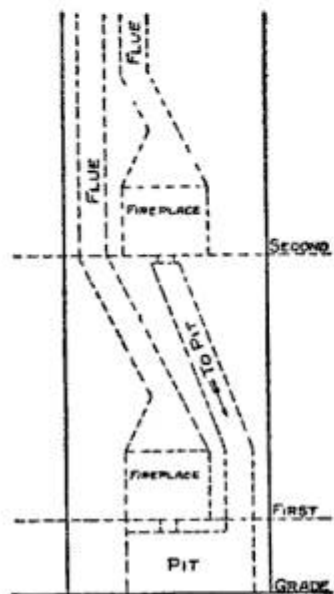


Fig. 2—Arrangement of Flues

there it may be carried to either side as required. In no case should the flue rise directly from one side of the fireplace, since this would cause it to smoke on the opposite side.

The sectional area of the throat and of the flue also, should be one-tenth the area of the fireplace opening.

For example, if the fireplace opening is 4 ft. wide and  $2\frac{1}{2}$  ft. high, the sectional area of the opening would be 10 sq. ft.; this, divided by ten, gives a flue 12 in. square and the throat at its opening would be 3 in. by 48 in., both throat and flue having a sectional area of 144 sq. in., or one-tenth of the fireplace opening.

An important consideration is the depth of the fireplace. The distance from the face of the fireplace to the fire brick back, when intended to burn wood should never be less than 18 in.; and 14 in. for a coal grate. These are the minimum depths and it is advisable in either case to make them 2 in. deeper. The fireplace intended to burn cord-wood should be at least 4 ft. 6 in. wide. The dimensions of fireplace openings vary according to the design. They are usually from 30 to 48 in. wide, 18 in. deep and from 24 to 36 in. high. In large ballrooms, club rooms, cafés, hotel parlors, etc., they may greatly exceed these dimensions.

In order to avoid frequent repairs

and also to lessen the danger of the floor timbers becoming ignited by fire dropping through cracks in the bricks, all fireplaces should be lined with fire-brick, and a tile flue is much better than a cement plastered or a pointed up flue. Carry the tile about 2 in. above the chimney cap, so that the water will not wash off the top of the chimney into the flue.

Many fireplaces smoke, but the remedy in most cases is very simple. The common cause is the clogging up of the chimney, during the construction, with rubbish. Often a small piece of board will be dropped into it and, lodging at an angle in the chimney, prove a hindrance to the draft until a brick or stone is dropped down from above to loosen and dislodge it. Another common cause of smoking is the damper used in the throat. The sliding damper, which, when open still closes half of the throat with its metal parts should never be used. The

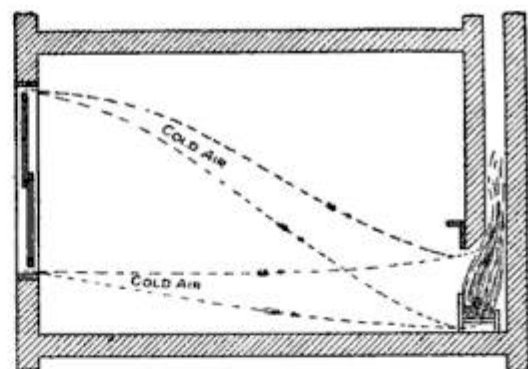


Fig. 3—Air Pushing into Supply Draft to a Fireplace

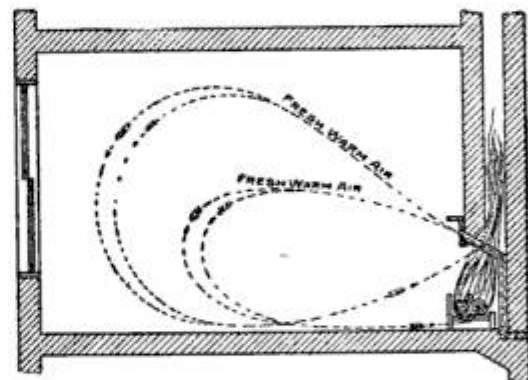


Fig. 4—Circulation of Air in Room When Fireplace Has Its Own Draft

damper when open should leave the entire throat free and unobstructed. There are several dampers on the market that accomplish this easily, some of them being controlled from

the outside. There should always be a damper in the fireplace throat, since there are times when it is desirable to close up the passageway. In some parts of the country it has been observed that mosquitoes make their way down through the opening in the fireplace. When some kind of a damper is provided this is prevented. The best kind of damper is one that is constructed to regulate the draft according to the amount of fire needed and its condition.

The hearth of the fireplace should extend 16 to 24 in. into the room, and it should be level with the floor. Unless this is specified, the mason probably will build it about  $\frac{1}{2}$  in. higher, which will necessitate a molding to break the joint. Then, when the hearth is flush with the floor, any debris made while building the fire (and there is always sure to be some) may easily be swept into the fire.

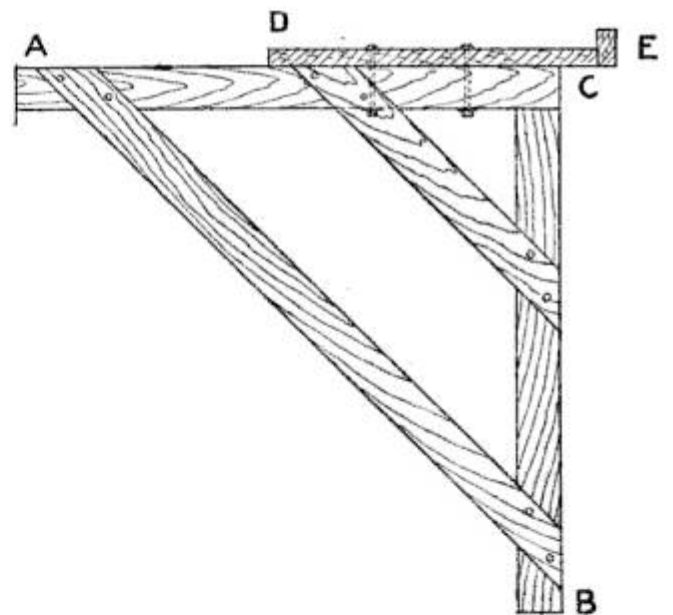
The best hearths are constructed from brick laid on edge, but satisfactory ones may be made with the bricks used flat side up, in which case only about half as many bricks will be needed. The "herring bone" pattern is one of the most popular constructions for hearths.

To provide for the draft of a fireplace is another important item in its construction, says a correspondent of the House Beautiful. Just as air cannot be sucked out of a bottle, so draft for a fireplace cannot be drawn out of a tight room. The careful construction of modern houses, with tight-fitting doors and windows, with sheathing paper and with back plastering, is responsible for many smoky fireplaces. It is not that the oxygen of the air is burned, but that the chimney cannot get the air current to carry off the smoke. The opening of a door or window, as shown in Fig. 3, in such a well made room will, of course, give the air supply for the fire. It is an extravagant and unsatisfactory way, however, to warm the outside air after it enters the room, to say nothing of the unpleasant cold drafts near the

floor. Inventors for the past hundred years have endeavored to supply the air for the fireplace so that it would not cross the room in a cold stream. The most satisfactory way yet found is to have a cold air box bring a supply from outdoors. Pipes or tubes should carry the supply across the fireplace, and introduce the air warmed through a register at the top of the fireplace or over the mantel as shown in Fig. 4. This means an increase in the amount of heat realized, as well as making the air pressure right for the free burning of the fire.

### A Carpenters' Scaffold Bracket

The accompanying sketch shows the construction of a carpenters' bracket to hold scaffolds. The main part of

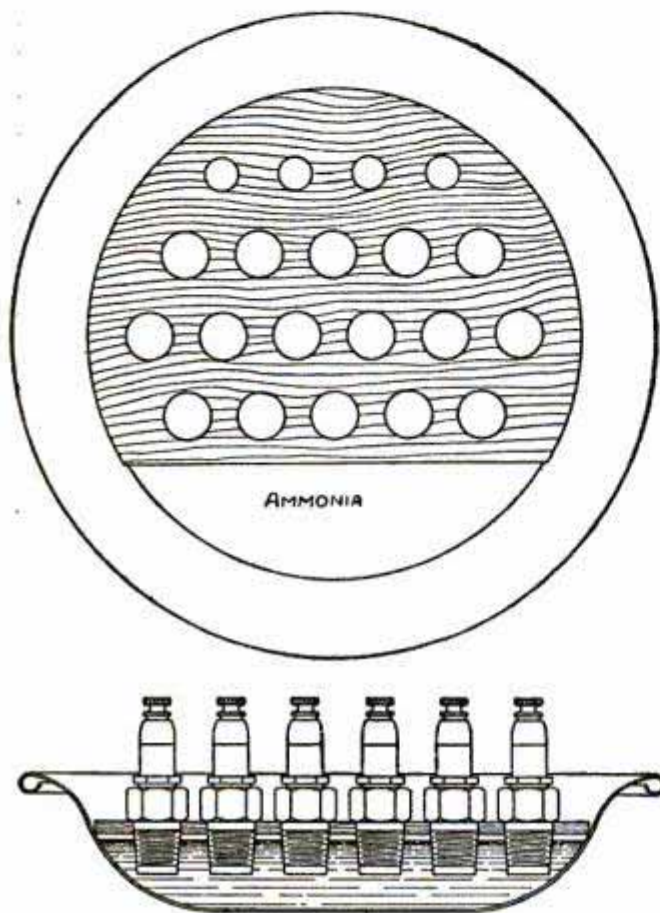


This Bracket Needs No Brace

this bracket is made up in the usual manner and to the piece A C is securely fastened an iron rod, projecting about 1 in. beyond the end of C and then turning upward for a little over 1 in. A  $1\frac{1}{4}$ -in. hole is bored in the sheathing at the right place and the end of the rod inserted in the hole; let the bracket fall in place and secure with a nail driven through CB into the sheathing. An iron crosspiece may be fastened on the end of C to make it more rigid.—Contributed by D. F. Showalter, Davenport, Neb.

### How to Clean Spark Plugs

The accompanying sketches show a very simple yet efficient method of cleaning spark plugs and will be found



Plugs in the Ammonia

very useful around an automobile garage.

Take an ordinary porcelain washbasin and cut a thin board to fit it as shown in the bottom sketch. Bore holes in the board to suit the size of the spark plugs to be cleaned. Place the board in the pan, then put the plugs in the holes, sparking end down. Now pour concentrated ammonia into the pan until it almost touches the board. Let it stand from 15 minutes to one hour then brush the plugs with a stiff tooth-brush dipped into the ammonia, and the carbon can be easily cleaned from them. If the plugs are rinsed in hot water after cleaning they will dry much quicker.—Contributed by Claude M. Sessions, Waynesville, Illinois.

Venetian red darkened with lamp-black makes a good imitation rosewood stain.

### Some Vise Attachments

When suitably equipped, the usefulness of a vise is greatly increased and a variety of operations can be quickly and easily done. The following list of accessories are worthy of consideration:

1—A pair of copper or brass jaws. These are used to grip irregular shaped pieces that are held by the vise jaws, say, in only one spot; the softer metal yields and fills out the low places. Brass jaws are good to grip finished work that must not be marred or pinched on the edges by the regular jaws.

2—A pair of fiber jaws, to hold brass work and very particular finished iron and steel pieces. Brass jaws will bruise the latter, unless used with utmost care.

3—A pair of round-cornered jaws. Use these for making bends in flat stock that does not need to be sharp. Have one jaw rounded to 1/16-in. circle and the other to 1/8 in. The ends may also be rounded.

4—One swivel piece. Very often it is desired to hold some taper work and unless it is put in a swivel-jawed vise, the piece is very hard to hold. This swivel piece is simply a three-sided chunk of steel, as shown in Fig. 1. The piece is self-adjusting for any angle.

5—A lazy man or rest piece. This is a block of wood or metal having clips screwed on the ends to keep it in place, Fig. 2. This is used to lay work on when it is too small to rest on the bottom slide. It can be made adjustable, or added to, or a set kept on hand of



FIG. 1



FIG. 2



FIG. 3

Attachments as Used

various heights. Anyone who has tried this knows how aggravating it is to hold an 80-lb. piece between the jaws of a vise and on a level with them,

meanwhile trying to tighten the vise with the knees; then perhaps have the work slip to the slide just as you have the screw about tight enough. With these blocks, the piece may be set to the proper height and the screw tightened with one hand.

6—A pair of V groove jaws. Use these to hold round stock. It is best to have at least one end rounding so the stock can be bent if necessary. These jaws are shown in Fig. 3.—Contributed by Donald A. Hampson, Middletown, New York.

### A Lumberman's Shield

Yardmen and carpenters, or men carrying boards and boxes on their shoulders, find it necessary to use pad-



FIG. 1

The Leather Protects the Cloth

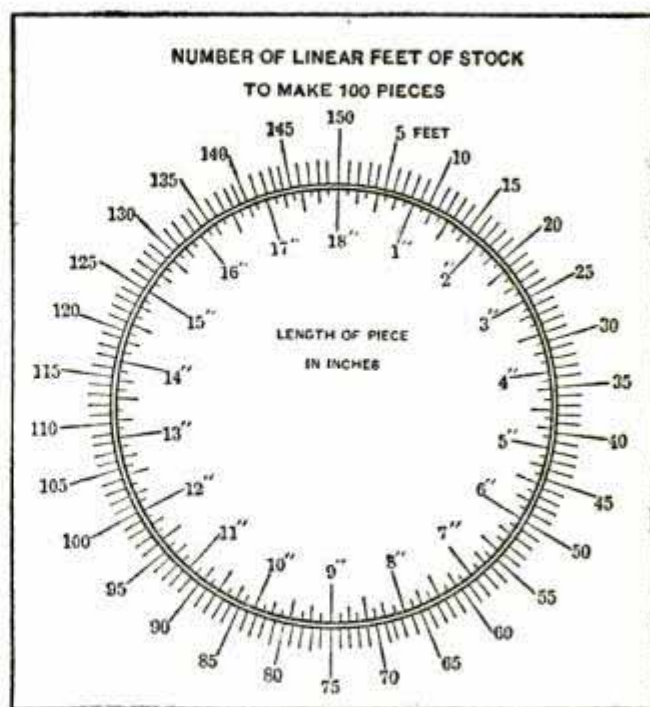


FIG. 2

ding or some old worn-out coat to protect the wear on the clothing as well as the flesh on the neck. A light shield can be made for this purpose, as shown in the sketch, from a piece of leather. The part to cover the shoulder is shaped as shown in Fig. 1 with two flaps attached with buttonholes. The other piece to protect the neck is attached to the first piece and the whole fastened to the shirt or coat with buttons.—Contributed by L. F. Canavan, Albany, N. Y.

### Chart for Stock Purchasing Department

A handy chart for use in ordering stock or checking up to see if enough material is on hand, is described by a correspondent of Machinery. The inner circle of figures, shown in the accompanying illustration, represents the length in inches of the piece re-



For Checking Up Stock

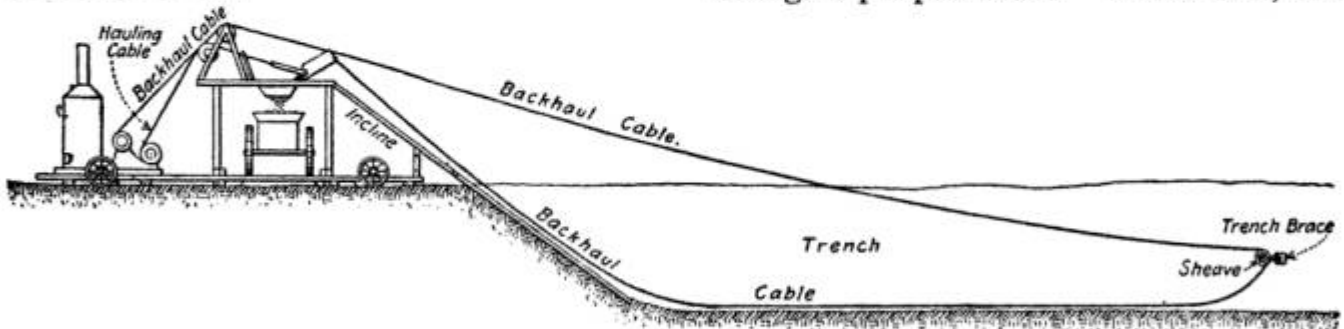
quired; while the figures on the outside give the number of linear feet of stock necessary to make 100 pieces. For example, if the length of a piece as per order is  $2\frac{7}{8}$  in., and there is an allowance for cutting  $\frac{1}{8}$  in. off, the total length would be 3 in. Referring to the chart the figure 3, in the inner circle, is opposite the figure 25 in the outer circle, which is the required number of feet in making 100 pieces; having this, the amount of stock for any number of pieces can easily be determined.

### Water Main Leaks Located by a Telephone

A leak that was causing a great deal of trouble for a water company could not be located by ordinary means and the employes finally used a telephone to find the break, says Telephony. The instrument was attached in a circuit containing a battery to hydrants or other points of contact with the water main, and as soon as they were within 1,000 ft. of the break, they were able to detect it by the increased sound of the rushing water. The persons that found the leak by this method are very enthusiastic over the device which enabled them to locate the trouble when other means failed.

### Trenches Made with a Scraper Excavator

The use of power-operated scrapers or scraper buckets in the excavation of trenches for sewer or other work is one of the latest applications of the scraper bucket type of excavator, says Engineering News.



Scraper Buckets Used in Making a Long Trench

With the system described below, the trenching is done in lengths of about 75 ft. to 100 ft. At the forward end of the length is stationed a portable tippable or dumping frame, the platform of which is at such a height above the street as to allow wagons to be driven under it. One end of the tippable carries an adjustable incline extending down the head of the trench. The other end has an A-frame with two cable sheaves. In front of the tippable is a double-drum hoisting engine. The bucket has a pivoted bail. It is 3 ft. wide, of about 25 cu. ft. capacity, and weighs 400 lb.

A  $\frac{3}{4}$ -in. hauling cable is attached to the bail of the scraper bucket, and is led over a sheave on the A-frame to one of the drums of the engine. The second drum carries a  $\frac{1}{2}$ -in. back-haul cable which is led over the upper sheave on the A-frame and back to the rear end of the section being excavated; there it passes through a sheave or snatchblock hitched to a cross brace at about mid-height of the trench and returns to the back end of the bucket, to which its end is attached. This cable is used to pull the empty scraper back into position for a fresh cut. This is done without interference with the trench bracing, the cable being led over or under the cross braces as occasion may require. The general arrangement of the plant is shown in the accompanying cut.

When the bucket is at the back end of the section and ready to start, a signal is given from the trench to a man on the tippable platform, who signals the engineman. As the bucket is started by the hauling cable, two men hold its nose or cutting edge to the ground to ensure its making a cut and taking a proper load. When full, the

weight is at the back of the bucket. The bucket is hauled along the bottom of the trench and up the incline to the tippable, where it strikes a trip block and is tilted up (as the hauling continues) so as to dump its contents through a chute into a car or wagon standing beneath.

Where the ground is hard, a plow is used; this is attached to the same cables and takes the place of the bucket. The plow cuts about 18 in. deep. It is of special form, with no handles, as the handles of an ordinary plow would be liable to catch in the bracing when the plow is being hauled back ready for a new cut. Its weight is from 400 to 700 lb., according to size.

### Campers' Cups

Some campers lost their tin cups and as they were several miles from the



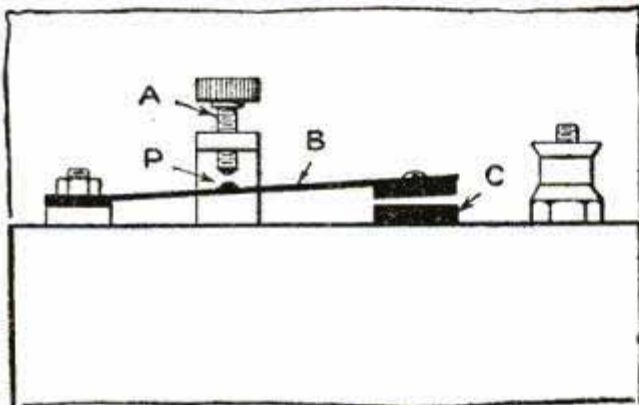
nearest tin shop they decided to make a few substitute cups from the tomato cans they emptied. The entire cover was removed from each can and the tin was cut with a pair of shears  $\frac{3}{8}$  in. on each side of the seam down to a depth that would make the right height for the cup. The metal



was then cut around the can, except the seam, which, when bent, made a good handle. One-eighth inch of the edge was rolled over so it would not cut the lips.—Contributed by Geo. Hogan, Providence, R. I.

### Adjusting a Spark Coil

The trembler on a spark coil may be adjusted by first removing the spark plug, and, if the points are about  $1/32$  in. apart, removing the vibrator contact screw, A, as shown in the sketch; then adjusting the vibrator spring, B, so that the hammer or piece of iron on the end of the vibrator spring stands normally about  $1/16$  in. from the core of the coil C; now screw in the con-



Adjusting the Vibrator

tact screw A until it just touches the platinum contact P on the vibrator spring. Start up the engine and if it misses fire at all, tighten up or screw in the contact screw a trifle at a time until the engine runs without missing explosions. If the carburetor is properly adjusted and the coil and wiring in good condition, it should now give a quick action and ample spark with the smallest possible consumption of battery energy.

### How to Fasten Mallet Handles

The old method of fastening mallets to handles by boring a hole through the head and inserting a wedge from the outside may be superseded by a new way that makes the tool much neater and one that conceals the wedge and eliminates all possibility of the head flying off as the wedge cannot

come out. This new way is to bore a hole the size of the handle and three-



Fig. 1

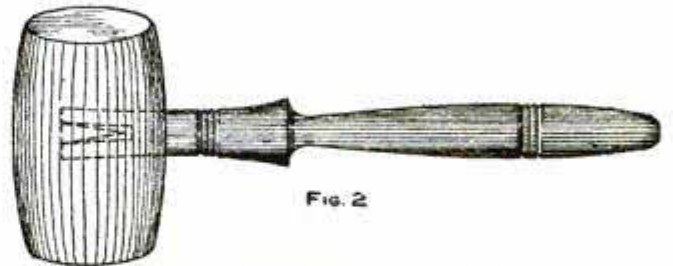


Fig. 2

The Wedge Does Not Show

fourths the distance through the head, then cut a slot in the handle and insert a wedge as shown in Fig. 1. Put the wedge end into the hole bored in the head and drive it in. When the wedge touches the bottom of the hole (Fig. 2) it will be driven into the split of the handle thus forcing the sides out and making a tight fit.—Contributed by Louis P. Lukert, Philadelphia, Pa.

### A Home-Made Alligator Wrench

The accompanying sketch shows a light alligator wrench which can be made by any blacksmith.

Secure a piece of steel of suitable length and cut a number of teeth in it with a triangular file as shown in Fig. 1. Then bend it as shown in Fig. 2. To bend, first heat the piece red-hot and cool the ends in water, except where the bend takes place. After bending, redress the teeth, if necessary, and temper in oil until a smooth file

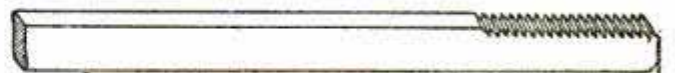


Fig. 1

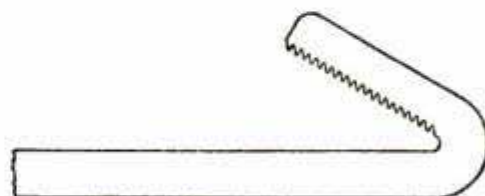


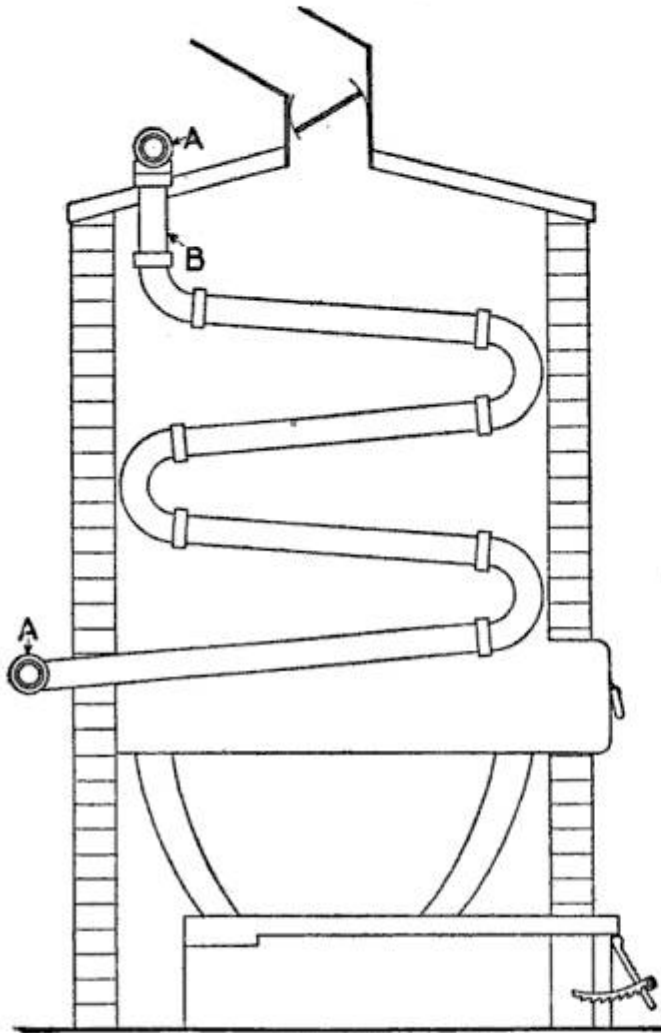
Fig. 2

One-Piece Pipe Wrench

will just cut the metal. The wrench will be found very useful for light work.—Contributed by J. H. Byers, Little Rock, Ark.

### Home-Made Hot Water Heater

As we desired to put in a hot water heating system in our house and as the estimates seemed too high for us, we



Pipe and Pipe Fittings Used

decided to put in the system and to make our own heater, which, when completed, proved very satisfactory and was much cheaper to install. A firebox, grates, ashpan and door from an old hot air heater were used. Then a pipe boiler was constructed from two manifolds, A, which we purchased, each having four outlets for 1-in. pipe openings and in both ends for 1½-in. pipe. Twelve 1-in. return bends, four 1-in. ells and four 1-in. nipples, 6 in. long, were purchased. The center lengths of pipe were cut so as to bring the return bends inside the casing and the manifolds outside.

The pipe had to be bent a little so as to give it a drop and not allow the water to trap. The burr was reamed out of the pipe ends to allow free circulation. There were four sections

made this way, one for each opening in the manifolds. The casing was built of brick covered with cement after all the piping and firebox fixtures were in place. The top is one piece of cast iron, made from a pattern of our own construction.

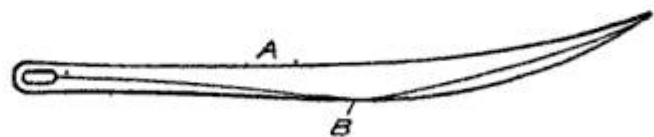
Connections were made to the system from the ends of the manifolds which were 1½-in. pipe. The hot water was taken from the top manifold and the return connected to the bottom. This boiler has been in use for some time and has given entire satisfaction.—Contributed by H. O. Hingley, Smithville, N. J.

### Injury to Tires Ridden Soft or Deflated

The pneumatic tire is the best for runabouts and touring cars because of its resiliency, ease of operation and its quick and simple method of repair. Pneumatic tires are susceptible to punctures and other injuries which, if not given the proper attention, result in a soft or deflated tire. The user, quite often through an ignorance of the technical construction, or probably from an indifference to the result, will ride the tire a considerable distance deflated, which will injure a tire so it will require quite an expenditure for repairs, or render it unfit for further service. Although it is not always convenient to make repairs or replacements with an emergency tire carried for that purpose, it is beyond doubt advisable, in view of the injuries that will probably otherwise occur.

### Sack Needle and Twine Cutter

This little tool, as illustrated, was devised by a correspondent of the American Miller and has proven to be a



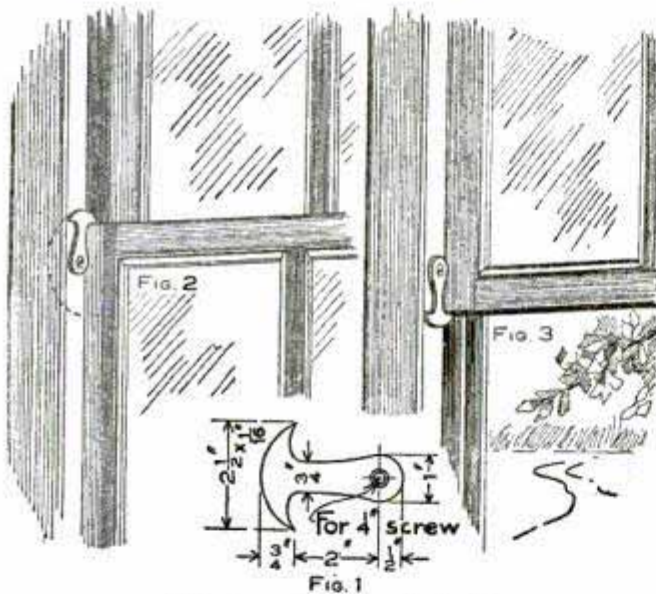
A Miller's Sack Needle

great time saver. Simply sharpen one side of the needle near the point. This cuts the twine.

**Factory Window Stops**

A factory properly constructed requires a great number of windows and to fit them with weights and locks would make quite an expense. Plenty of air can be admitted by having the upper sash stationary and the lower sash movable.

The illustration shows how the movable lower sash can be locked at night and held open in the day time without the use of weights or expensive hardware. A small piece of 1/16-in. iron or heavy galvanized iron can be used in forming the lock, as shown by the small detail, Fig. 1. The metal should be pivoted to the window frame far enough below the meeting rail of the



Window Catch and Lock

sash so that when the lower sash is down, the edge of the lock will clamp on the top of the sash, as shown in Fig. 2.

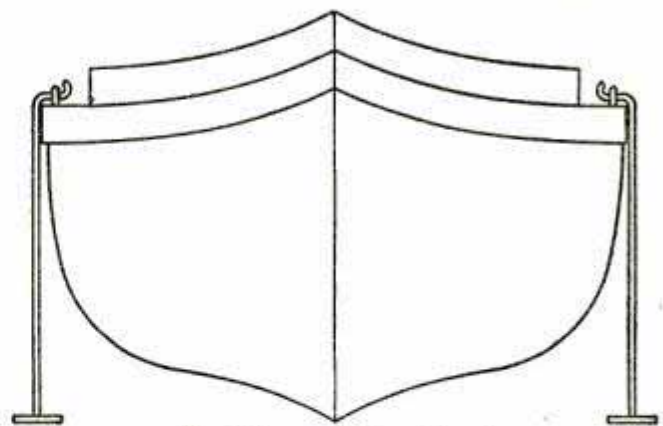
When the window is raised the lock can be swung around so it will catch underneath the window which holds it open (Fig. 3), taking the place of weights.—Contributed by E. R. Armstrong, Springfield, Ill.

**Supports for a Small Boat**

The accompanying sketch shows a very simple contrivance for keeping a small boat or launch upright when aground or in very shallow water.

Secure two iron rods of suitable size,

a little longer than your boat is high. Bend one end of each to fit the gun-

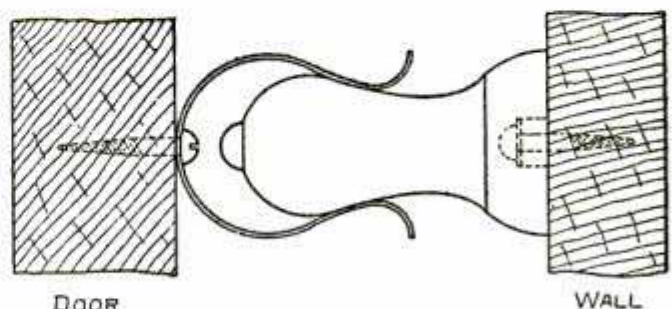


Boat Supported on Land

wale of your boat as shown in the sketch. Tap the other end into a plate or cast-iron block of the proper size. Screw two large screw eyes into the gunwale of the boat, one on each side, and by hooking the rods into them your boat will remain upright on almost any kind of a bottom.—Contributed by Newton Thomas, Jr., Seattle, Wash.

**Door Retainer**

A simple and inexpensive door retainer can be made out of an old clock spring, or a scrap piece of steel, by anyone in a few minutes' time. Secure a piece of material about 6 1/2 in. long and 1 1/2 in. wide; drill a hole in the center for a screw and bend it as shown in the accompanying sketch. Fasten it securely to the door with a screw so that it will catch an ordinary wooden door stop at the wall when pushed against it. A slight pull will unfasten

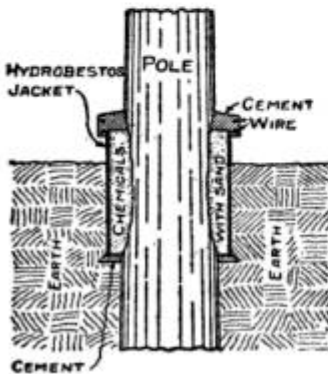


Stop and Catch Combined

the catch, yet a strong draft will have no effect on it.—Contributed by K. Kuga, Hoquiam, Wash.

### A New Method of Preserving Wooden Poles

A new method of preserving wooden poles and posts from decay at the ground line was described in a paper by H. P. Folsom read before the Association of Railway Telegraph Superintendents in Detroit. The main feature of this method is in surrounding the base of the pole with a fiber cylinder which encloses a mixture of powerful germicides packed around the pole above and below the ground line.



removed from the surface of the pole, and the bottom of the hole is then covered with a thin layer of Portland cement mixed with sand. A cylindrical jacket of "hydrobestos," a mixture of asbestos and asphaltum, about 4 in. larger in diameter than the butt of the pole, is then put in place in the hole with the lower edge embedded in the cement. The two edges of the jacket are lapped over about 2 in. and fastened with a specially prepared cement. The intervening space is then filled with a powerful germicide mixture packed in dry. The mixture ordinarily used consists of the following: 2 parts chloride sodium (rock),  $1\frac{1}{2}$  parts hydrated lime, and 3 parts sand, all thoroughly mixed together. After this is packed about the pole, a small amount of powdered sulphate of copper is poured in on top. A reinforced cap or collar made of Portland cement and sand is now formed around the pole on top of the jacket. For the reinforcement, one or more turns of an old telegraph or telephone wire are used. The reinforced cap protects the chemicals and the jacket from the action of rain and snow, and also protects the pole against damage from grass fires. The

chemicals are slowly dissolved by the natural moisture in the pole, and they pass into the cell structure of the wood by capillary attraction. This continuous absorption destroys all fungi which may be in the pole at the time the preservative is applied, and the jacket and cap prevent the lodging of other germs in the wood near the ground line. The cement cap gives a finished appearance to the pole and experience has proved that there is little or no tendency for the concrete to crack or disintegrate, as there is no expansion or contraction in the pole which it surrounds.

### Figuring the Chord of an Angle

Many of our best and most practical machinists are at a loss sometimes, for the want of a little technical knowledge, to know how to do certain things the easiest and shortest way. Especially is this so in jig and die work where great accuracy is required.

An example came to our notice a short time ago where a machinist had five bosses to lay out to be drilled for bushings. By referring to the diagram, it can be seen how they were located. They varied in height by  $\frac{1}{2}$  in., else it would have been an easy matter to lay them out with a protractor. The machinist located the first three that were in a straight line very easily. He then did a little figuring and found the chord distance to the other bosses. Finding the length of the chord is a very easy matter, for most mechanics carry a small hand-book of some

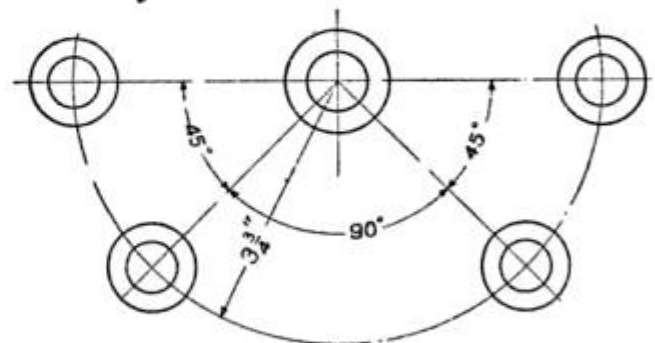


Diagram of Angles

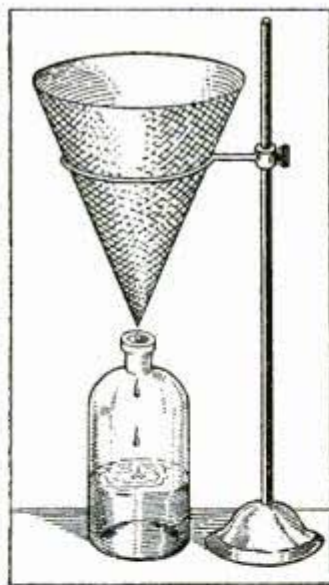
sort that contains a table giving the sines of the angles. In this instance we have a 45-deg. angle, the sides of which are the same as the radius of the circle ( $3\frac{3}{4}$  in.) on which the bosses are

located. To find the length of the chord, take one-half the angle, which gives us 22 deg. and 30 min. Looking up the sine of 22 deg. and 30 min. in the table, we find it to be .3827. Multiply this by the diameter of the circle ( $7\frac{1}{2}$  in.) and we have the length of the chord, which is 2.87 in., or the distance from one boss to the other. The machinist used  $\frac{1}{2}$ -in. buttons on the bosses that were low and lined them up with an indicator before boring. When the job was finished it was found to be correct.

Any other angle could have been figured in the same manner. Die and templet makers quite often have use for this information as they frequently have to check over the draftsman's figures and a slight mistake means a loss of time and money.—Contributed by J. V. D.

### Wire Screen Funnel for Holding Filter Paper

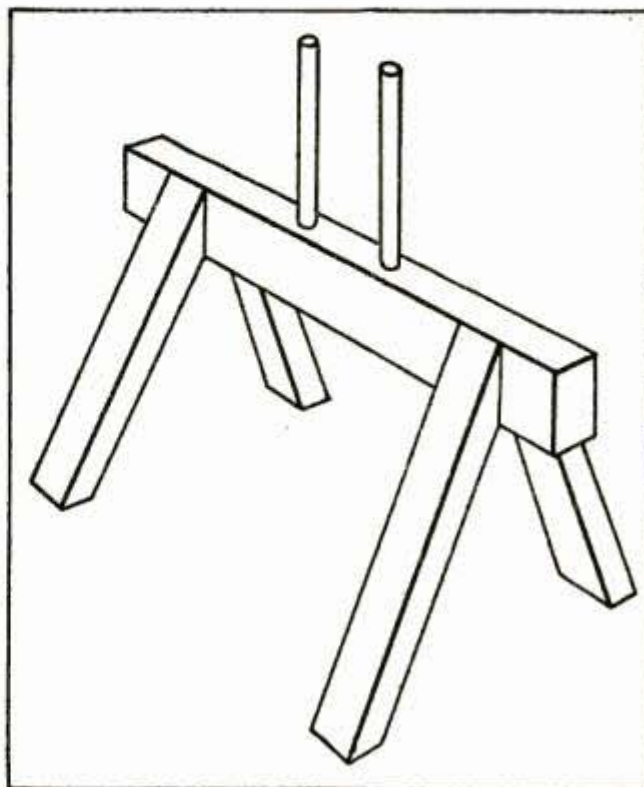
If filter paper is placed in an ordinary funnel, no solution will go through the paper, except at the point end. Corrugated glass funnels are made to assist the solution after passing through the paper in flowing toward the opening in the stem of the funnel. Herewith is illustrated a funnel made from  $\frac{1}{4}$ -in. mesh nickel



plated wire screen formed into a cone. The filter paper is placed inside of the wire screen cone in such a position as to adhere to the sides when the liquid is poured in and when filtered through the paper the solution will follow the wires until it drops from the pointed end into the container. This funnel gives free access for the liquid to seep through the filter paper anywhere.

### A Sack Turner

The illustration shows a very simple home-made sack turner that is very useful about the flour mill. The turner



Carpenter's Trestle with Two Pins

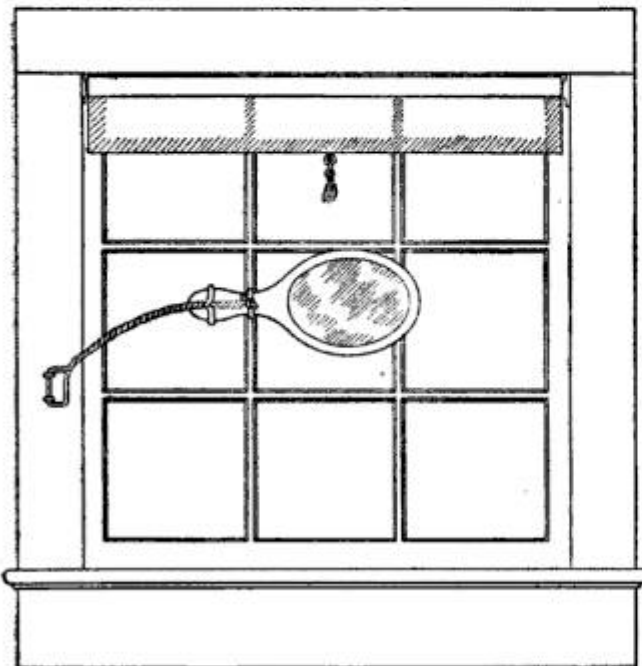
consists of an ordinary carpenter's trestle with two holes bored into it the right size to hold a broom handle and wide enough apart to accommodate the width of the sack it is desired to turn.

Take the top of the sack between the thumb and finger of each hand and place at top of the broom handles. Turn the outer edge over the ends of the handles and pull down. The sack is now wrong side out. Lift it off the handles, shake the dust off and then pull it down over the broom handles as before and the sack is turned back, right side out, all clean and ready for use, says the American Miller. It is possible to turn any size of sack in this way by having the handles the right distance apart to suit the width of sack.

Felt from an old hat makes good packing for automobile water circulating pumps. Strips should be cut to fit snugly in the stuffing box. When the follower is screwed down, it will expand the felt and make a watertight joint.

### An Adjustable Window Shaving Mirror

A common hand mirror may be easily converted into an adjustable window shaving glass by twisting a

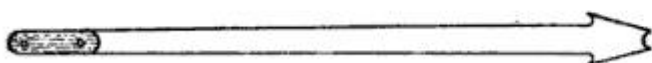


Mirror Attached to a Window

piece of  $\frac{1}{8}$ -in. wire that is 3 ft. long into the shape shown in the sketch. If only one position of the mirror is desired, the wire may be bent in a square with the ends twisted for 12 in. of the length and fastened with two staples as shown. Where it is to be adjustable, a 2-in. ring is made in the center and the extending ends of the wire twisted together. One staple is put over the wire in the ring and driven into the window casing. The wire can be adjusted to any position by slipping the ring part through the staple. The wire at the twisted ends can be easily fastened to the wood handle of the mirror.—Contributed by A. Pujols, Ft. Screven, Ga.

### A Simple Nail Puller

A harpoon or nail puller for hooking out nails in repairing slate or shingle



roofs is shown in the accompanying sketch. The one I made was cut from

an old cross-cut saw blade, but any other good steel will answer the purpose as well. The hooks should be filed sharp. A piece of wood can be riveted to each side of one end for a handle. It will be found a very handy tool for those who do much roof repairing.—Contributed by John A. Wolfgang, McAlisterville, Pa.

### Laying Out Keyways on Locomotive Drive-Wheel Axles

A quick and accurate method of laying out keyways on locomotive drive-wheel axles is here shown.

Clamp the axle on the bed of the machine on which the keyways are to be cut, then with a square draw a perpendicular line through the center of one end of the axle (Fig. 1), and with a surface gauge draw a horizontal line through the center of the opposite end (Fig. 2). With a box square extend these lines along the sides of the axle where the keyways are to be cut. Make a small mark with a center punch on each of these lines and with each of these marks as a center draw circles with a divider, the diameter of the circles being equal to the width of the

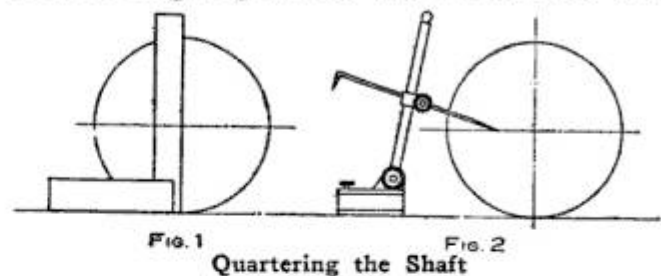


FIG. 1  
FIG. 2  
Quartering the Shaft

keyways to be cut. Cut the keyways to the sides of the circles and the axle will be correctly quartered.—Contributed by R. T. Traylor, Suffolk, Va.

Bronze bearings may be cleaned with a solution of washing powder and water run through the oil cups while the machine is running without any load. The solution, cutting out the dirt and grime, will come from the bearing very black. About 1 pt. of this mixture should be run through each bearing, then clean thoroughly with clear water. This makes a bearing and axle smooth and clean.

# AMATEUR MECHANICS

## A Revolving Christmas Tree

[Condensed from Scientific American]

There is nothing more impressive at Christmas time than a revolving Christmas tree lighted by electric lamps. A simple and inexpensive way of arranging a revolving tree that will not upset, and is easy to put up and take down is illustrated herewith.

Locate a beam or lath in the ceiling near the selected place and cut a V-shaped piece in the paper and bend the point to one side. Into this exposed part of the ceiling screw a hook 3-16 in. in diameter. The tree is hung to this hook as hereinafter described. When the tree is taken down, and the hook removed, the V-shaped piece of paper may be pasted back to cover the hole which will leave no marks in the ceiling.

The inside or stationary part of an old bicycle pedal is fastened to the above mentioned hook and to the outer or revolving part are secured two wires about No. 12 gauge and 2 ft. long. These wires are securely fastened on opposite sides of the tree, preferably bent under a branch (Fig. 1). A piece of tin may be cut and fastened at the top of the pedal, as shown in Fig. 2, from which the tinsel and strings of glass balls may be hung.

To the lower part of the tree is secured an arrangement as shown in Fig. 3. This consists of a large grooved pulley about 12 in. in diameter by  $\frac{7}{8}$  in. thick, made out of ordinary pine board. The groove may be made with the edge of a half-round rasp. To the upper side of this pulley are secured three or more small brackets, which are fastened to the tree with wood screws. On the under side of this pulley are secured and insulated from each other two metal discs or rings such as brackets for ordinary gas globes, terminating on top of the pulley with

binding-posts. Into the centre is driven a tenpenny wire nail. A small

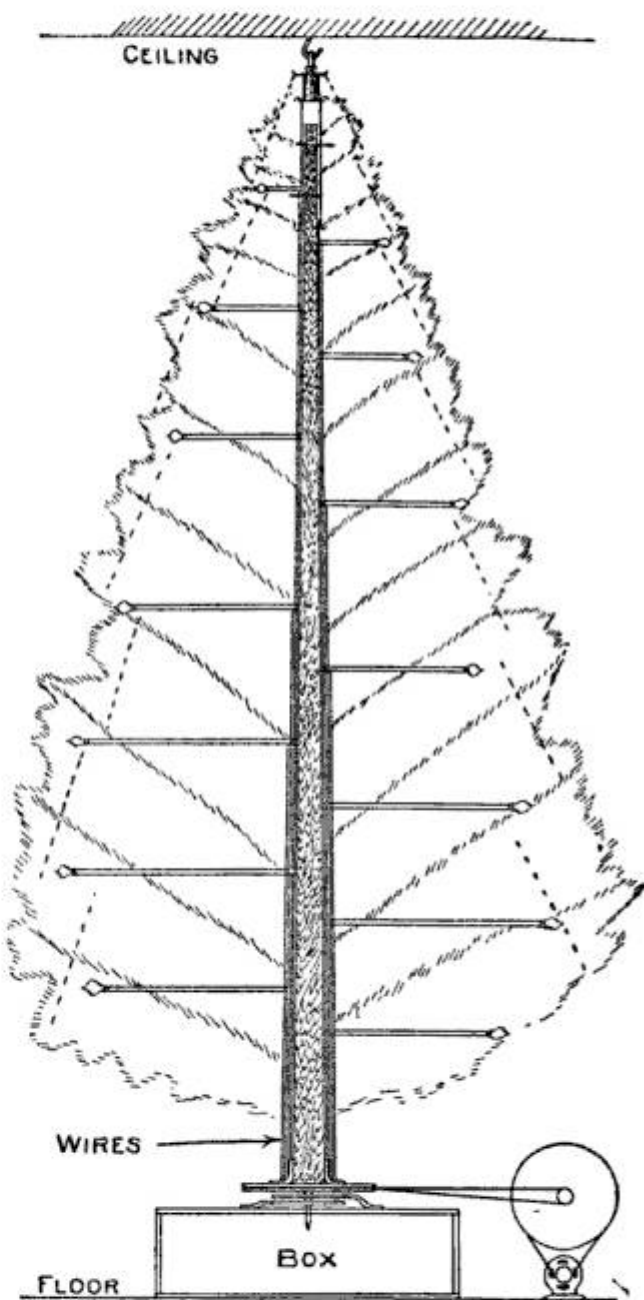
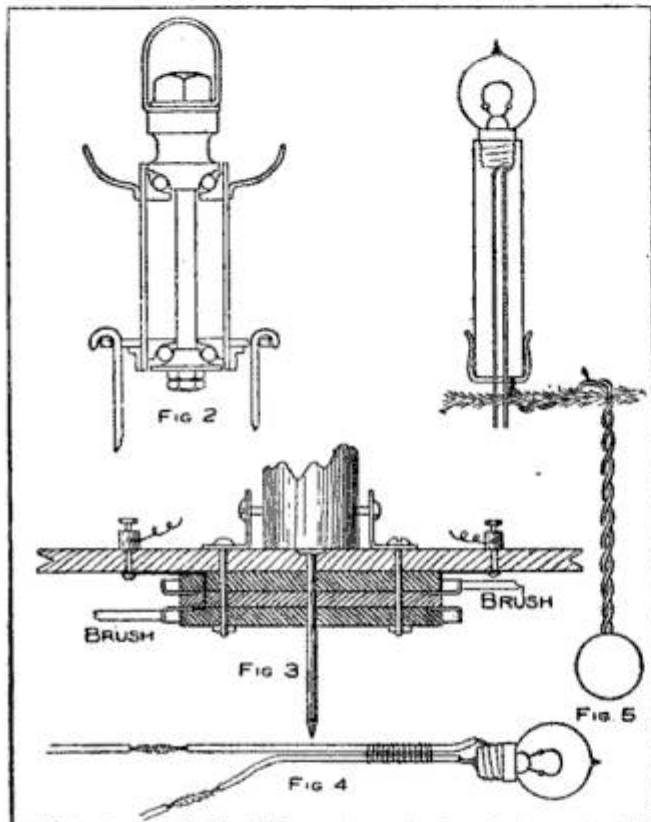


Fig. 1—Tree Hung from the Ceiling

box placed on its side may be put on the floor under the tree with a small hole to receive the nail. This forms a guide for the lower end of the tree. The box may either be nailed or weighted down, so as to keep the tree

steady. Fastened on the box, and insulated from each other are two copper brushes, one for each ring respectively. A small electric motor is now placed about 18 to 24 in. from the large pulley. As a rule, these motors run too fast for this purpose. A wire may be coiled about the motor shaft, and soldered fast to form a worm which may mesh with a train of clock wheels.



Details of Christmas Tree Construction

These can be obtained from any watchmaker. To the shaft of one of these wheels a small pulley is secured about 1 in. in diameter (Fig. 1). Wrap this pulley with cord, and put some rosin on, so as to increase the friction. Now place a small endless cord over the large and small grooved pulleys. The motor should be connected up with a dry-cell battery, and by placing in the circuit a switch or push button, the motor may be started at will.

The tree is now ready to revolve, and should make five to seven revolutions per minute. The batteries may either be kept in the box under the tree or in the cellar, where they will be out of the way. Two small holes may be drilled in the floor, about 2 in. apart. A

pointed copper wire about 8-gauge may be pushed through the rug or carpet into these holes, and connections made to these wires with the batteries in the cellar, and to the brushes on the top of the box, and by putting a switch in the circuit the current may be turned on or off.

From the binding-posts on top of the large pulley, the feed wires are run on opposite sides of the trunk of the tree to their respective lamps; ordinary bell wire will answer the purpose. It is best to run several of these feed wires, and to put about five lamps on each set. This gives far better and more uniform distribution of the electricity to the lamps than when large wires are used, as the top lamps get very little or no current. The lamps used in series from the ordinary current are by far too bright, as it simply puts the tree in the "shade." A soft light is the more desirable, and the tree may be decorated to a better advantage with battery lamps, as no unsightly sockets or heavy cords are used, and there is no danger of fire. The wires are soldered on the lamps, as shown in Fig. 4, and may be placed in the hands of the images used in decoration of the tree. The lamps may also be inclosed in small Japanese lanterns, which will greatly add to the beauty of the tree.

Another pretty effect may be obtained by using an ordinary tree candle with its usual holder hung on a bough. To do this, remove the wick by boring a small hole in the center of the candle, into which insert the wires, already soldered on to the lamp, letting the lamp rest on the top of the candle (Fig. 5). Of course, the more lamps used, the prettier the effect. A 7-ft. tree will require from 25 to 35 lamps.

The connection between the lamp and the feed wires may be done by twisting the ends together. Care should be taken that the ends of the opposite wires do not touch each other, and that no tinsel comes in contact with them. Run the branch wires on top of the branches. A diagram of the wiring is shown in Fig. 1.

When all the lights are turned on,



start up the motor and see that everything is all right, and that all the lamps are burning bright before decorating the tree. Then the lamps may be moved to suit the ornaments.

The box under the tree as well as the motor may now be covered up with cotton batting and small twigs cut from the lower branches of the tree.

Instead of placing the tree in front of a window, it may be placed in the center of a dining-room table. The table may be opened about 6 in. to let the trunk of the tree pass through. Some of the lower branches will have to be cut off. The chandelier may be removed and a small hook screwed on the pipe, from which the tree may be suspended. To close the opening in the table, two tablecloths must be used, and a few twigs may be placed where the cloths meet.

A double floor switch may be employed, to one side of which the wires from the motor, and to the other the wires to the lights may be connected. By manipulating the switch with the foot, the motor may be started or the lights turned on independently of each other.

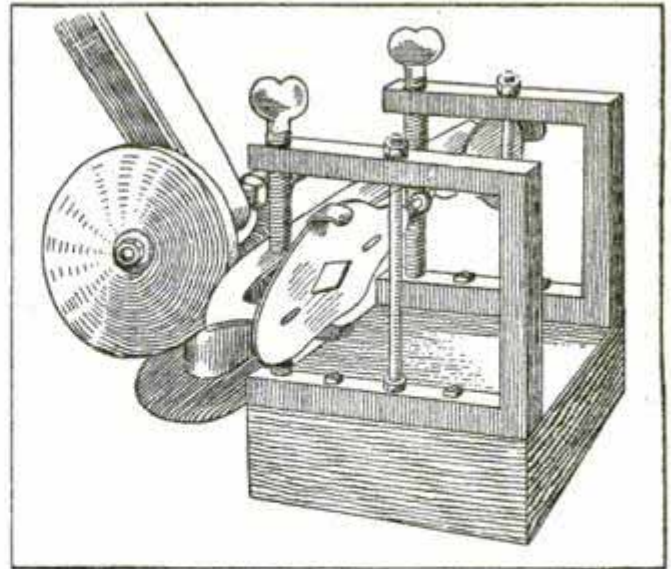
### Mounting Photo Prints on Glass

Photograph prints can be mounted on glass with an adhesive made by soaking 1 oz. of sheet gelatine in cold water to saturation then dissolving in  $3\frac{1}{2}$  oz. of boiling water. Let the solution cool to about 110 deg. F. then immerse the print in it and squeegee face down on a clear piece of glass. When dry, take a damp cloth or soft sponge and wipe off any surplus gelatine on the glass.

### Hollow Grinding Ice Skates

The accompanying sketch illustrates a practical method of clamping ice skates to hold them for grinding the small arc of a circle so much desired.

The clamps are made of  $\frac{3}{4}$ -in. soft steel U-shaped with the opening 6 in. deep and 5 in. high. The clamps are bolted to a block of wood 2 in. thick,



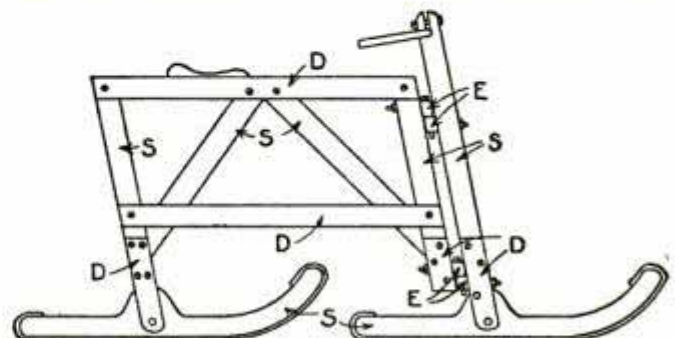
Skate Runner Fastened in Clamp

6 in. wide and 12 in. long. The skate runner is adjusted to the proper height by  $\frac{1}{2}$ -in. set and thumb screws. The block of wood holding the clamp and skate can be pushed along on the emery wheel table in front of the revolving wheel.

If properly adjusted, a slight concave or hollow can be made full length of the runner true and uniform.—Contributed by Geo. A. Howe, Tarrytown, New York.

### How to Make a Bicycle Coasting Sled

The accompanying drawing and sketch illustrate a new type of coasting sled built on the bicycle principle. This coaster is simple and easy to make, says Scientific American. It is constructed of a good quality of pine. The pieces marked S are single, and should be about 1 by  $1\frac{1}{2}$  in.; the pieces



Has the Lines of a Bicycle

marked D are double or in duplicate, and should be  $\frac{1}{2}$  by  $1\frac{1}{2}$  in. The run-



Coasting

ners are shod with iron and are pivoted to the uprights as shown, double pieces being secured to the uprights to make a fork. The seat is a board, to the underside of which is a block, which drops down between the two top slats and is secured with a pin. A footrest is provided consisting of a short cross-piece secured to the front of the frame and resting on the two lower slats. The frame and front fork are hinged together with four short eyebolts, E, with a short bolt through each pair as shown.

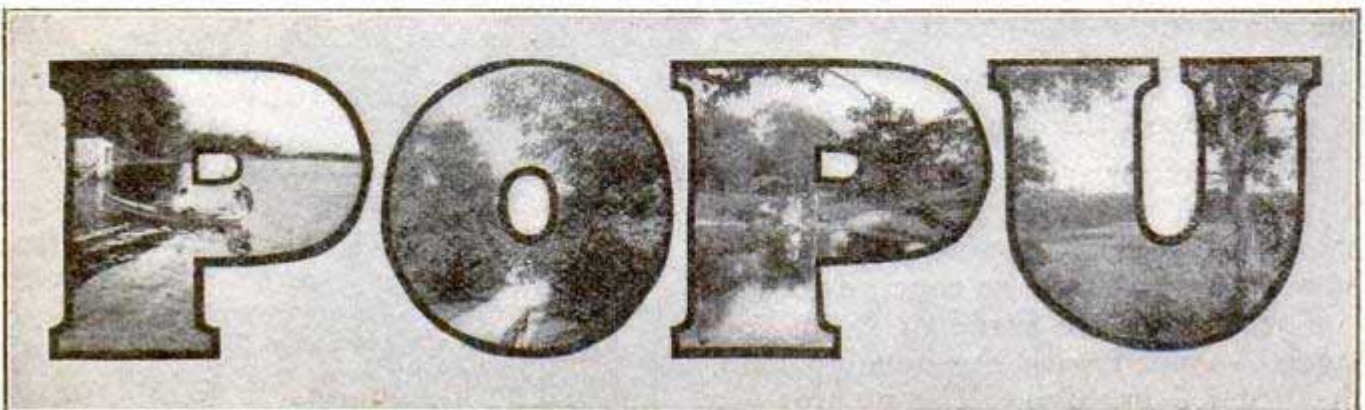
### Spelling Names with Photo Letters

There are, no doubt, many amateur photographers who make only occasional trips afield or through the more traveled thoroughfares with their cam-

eras during the winter months. Each one is generally interested in working up the negatives that he or she made during the summer or on that last vacation into souvenir post cards, albums and the like, for sending to friends. Illustrated herewith is something different from the album or photographic calendar. The letters forming part of the word POPULAR are good examples of this work.

The masks which outline the letters are cut from the black paper in which plates come packed. Their size depends on the plate used. A sharp knife, a smooth board and a straightedge are all the tools needed, says Camera Craft. If the letters are all cut the same height, they will look remarkably uniform, even if one is not skilled in the work of forming them all in accordance with the rules. Be sure to have the prints a little larger than the letters to insure a sufficient margin in trimming, so as to have a white margin around the finished letters. The best method is to use a good pair of scissors or a sharp knife.

Many combinations can be made of these letter pictures to spell out the recipient's name or the season's greeting. During the holidays the letters may be made from winter scenes to spell "A Merry Christmas" or "A Happy New Year." An Easter greeting may have more springlike subjects and a birthday remembrance a fitting month. The prints are no more difficult to make than the ordinary kind. In cutting out an O, for example, do not forget to cut out a piece to correspond to the center. This piece can be



Letters Made from Photographs

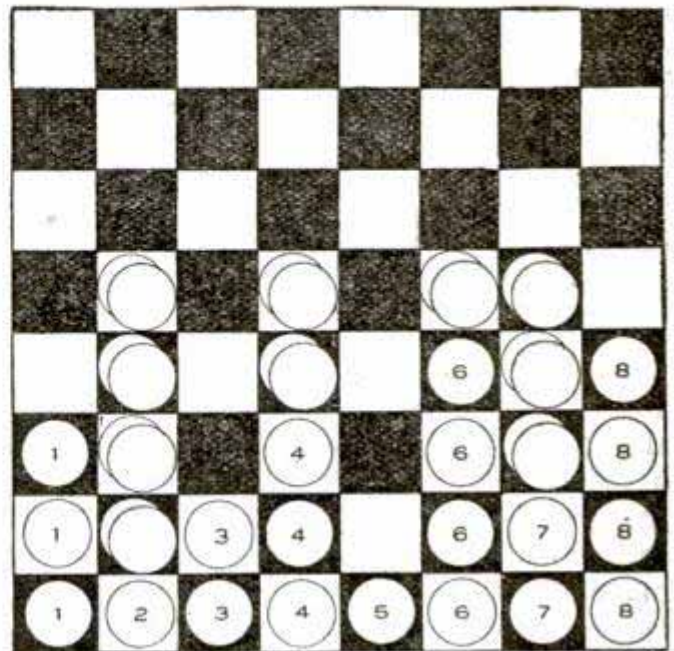
placed on the printing paper after the outline mask has been laid down, using care to get it in the right position, and closing the frame carefully so that the small piece will not be disturbed. The letters should be of the kind to give as large an area of surface to have as much of the picture show as possible. What the printer calls black face letters are the most suitable.

By cutting the letters out of black paper in a solid form, and using these as a mask for a second printing after printing the full size of the negatives, these letter pictures can be made with a black border. So made, they can be trimmed to a uniform black line all around; and, mounted on a white card and photographed down to post card size, the greeting so spelled out makes a most unique souvenir. Another application of the letters in copying is to paste them on a white card as before, trim the card even with the bottoms of the letters, stand the strip of card on a mirror laid flat on a table, and then photograph both the letters and their reflections so as to nicely fill a post card. Still another suggestion is to cut out the letters, after pasting the prints on some thin card, and then arrange them in the desired order to spell out the name or greeting, but with flowers interspersed and forming a background, photographing them down to the desired size. A third means of securing a novel effect by photographing down an arrangement of the letters is to have them cut out in stiff form as in the last method; mount them on short pieces of corks, in turn fastened to a white card forming the background. So arranged, the letters will stand out from the card about  $\frac{1}{2}$  in. If they are now placed in a light falling from the side and slightly in front, each letter will cast a shadow upon the background, and in the finished print the letters will look as if suspended in the air in front of the surface of the card.

A piece of sheet lead put on each side of a screw will fill up and hold the threads in a too large hole.

### A Checker Board Puzzle

Place eight checker men upon the checker board as shown in the first row in the sketch. The puzzle is to get



Placing the Checkers

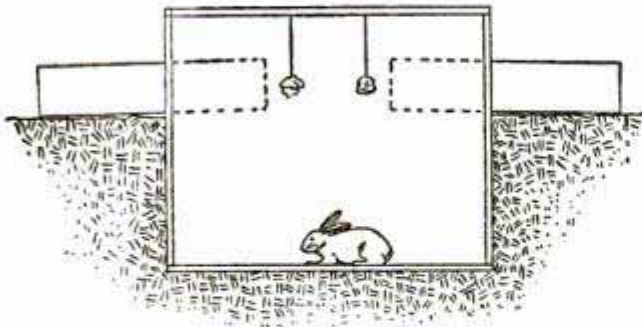
them in four piles of two men each without omitting to jump over two checker men every time a move is made.

The first move is to jump 5 over 4 and 3 on 2 which is shown in the second row, then jump 3 over 4 and 6 on 7 and the positions will appear as shown in the third row; jump 1 over 2 and 5 on 4 to get the men placed like the fourth row and the last move is to jump 8 over 3 and 7 on 6 which will make the four piles of two men each as shown in the fifth row.—Contributed by I. G. Bayley, Cape May Point, N. J.

### A Home-Made Rabbit Trap

A good serviceable rabbit trap can be made by sinking a common dry goods box in the ground to within 6 in. of its top. A hole 6 or 7 in. square is cut in each end level with the earth's surface and boxes 18 in. long that will just fit are set in, hung on pivots, with the longest end outside, so they will lie horizontal. A rabbit may now look through the two tubes, says the American Thresherman. The bait is hung on a string from the top of the large

box so that it may be seen and smelled from the outside. The rabbit naturally goes into the holes and in this trap



Rabbit in the Trap

there is nothing to awaken his suspicion. He smells the bait, squeezes along past the center of the tube, when it tilts down and the game is shot into the pit, the tube righting itself at once for another catch. The top and sides of the large box may be covered with leaves, snow or anything to hide it. A door placed in the top will enable the trapper to take out the animals. By placing a little hay or other food in the bottom of the box the trap need not be visited oftener than once a week.

### Old-Time Magic—Part VIII

#### Changing a Button into a Coin

Place a button in the palm of the left hand, then place a coin between the second and third fingers of the right hand. Keep the right hand faced down and the left hand faced up, so as to conceal the coin and expose the button. With a quick motion bring the left hand under the right, stop quick and



Making the Change

the button will go up the right-hand coat sleeve. Press the hands together,

allowing the coin to drop into the left hand, then expose again, or rub the hands a little before doing so, saying that you are rubbing a button into a coin.—Contributed by L. E. Parker, Pocatello, Idaho.

#### Buttonhole Trick

This trick is performed with a small stick having a loop attached that is too small for the stick to pass through.

Spread out the string and place it each side of the buttonhole, then draw the cloth around the hole through the string until it is far enough to pass the stick through the hole. Pull back the cloth and you have the string looped in the hole with a hitch the same as if the stick had been passed through the string.



The stick may be removed by pulling up the loop as if you were passing the stick through it, putting the stick in the hole and leaving the string on the outside, then spread the string, pulling up the cloth and passing the stick through the hole as before.—Contributed by Charles Graham, Pawtucket, Rhode Island.

#### How to Remove Paper from Stamps

Old stamps as they are purchased usually have a part of the envelope from which they are taken sticking to them and in removing this paper many valuable stamps are torn or ruined. Place all the stamps that are stuck to pieces of envelopes in hot water and in a short time they can be separated without injury. Dry the stamps between two white blotters. Stamps removed in this way will have a much better appearance when placed in an album.—Contributed by L. Szerlip, Brooklyn, N. Y.

## Imitation Arms and Armor

## PART I

Genuine antique swords and armor, as used by the knights and soldiers in the days of old, are very expensive and at the present time practically impossible to obtain. The accompanying illustration shows four designs of swords that anyone can make, and if carefully made, they will look very much like the genuine article.

The drawings are so plain that the amateur armorer should have very little difficulty, if any, in building up his work from the illustrations, whether he requires a single sword only, or a complete suit of armor, full size.

The pieces or designs in this article are from authentic sources, says the English Mechanic, so that where names are given the amateur can so label them, and will thereby greatly add to their interest and value.

An executioner's sword of the fifteenth century is shown in Fig. 1. The blade should be about 27 in. long with a handle of sufficient length to be grasped by both hands. The width of the blade near the handle is about  $2\frac{1}{2}$  in., tapering down to  $1\frac{1}{2}$  in. near the point end. Several ridges are cut around the handle to permit a firm grip. The cross guard is flat and about 1 in. in width.

Mark out the shape and size of the blade on a piece of wood  $\frac{1}{8}$  in. thick, using a straightedge and a pencil, and allowing a few inches more in length on which to fasten the handle. Cut out the wood with a scroll saw or a key-hole saw, trim the edges down thin and smooth both surfaces with fine sandpaper. The end for the handle is cut about 1 in. wide and 2 in. long. The cross guard is cut out and a hole made

in the center through which to pass the handle end of the blade. The handle is next made, and if the amateur does not possess a lathe on which to turn the shape of the handle, the ridges around the wood may be imitated by gluing and tacking on pieces of small rope. The handle is then mortised to receive the 1 by 2-in. end of the blade. The cross guard is now glued and placed



Fig. 1



Fig. 2



Fig. 3

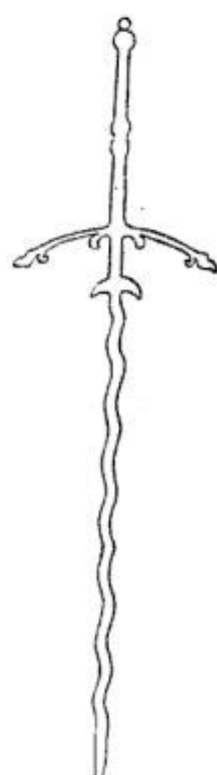


Fig. 4

on the blade, then the hole in the handle is well glued with glue that is not too thick and quite hot. The blade with the cross guard is inserted in the handle and allowed to set. When the glue is thoroughly dry, remove the surplus with a sharp knife and paint the handle with brown, dark red, or green oil paint. The blade is covered with tinfoil to give it the appearance of steel. Secure some pieces of tinfoil and cut one strip  $\frac{1}{2}$  in. wider than the blade and the other  $\frac{1}{4}$  in. narrower. Quickly paint the blade well with thin glue on one side, then lay evenly and press on the narrow strip of tinfoil. Glue the other side of the blade, put on the wider strip of tinfoil and glue the

overlapping edge and press it around and on the surface of the narrow strip. The cross guard must be covered with tinfoil in the same manner as the blade. When the whole is quite dry, wipe the blade with light strokes up and down several times, using a soft and dry piece of cloth. The sword is then ready to hang in its chosen place as a decoration, not for use only in cases of tableaux, for which this article will be especially useful to those who are arranging living pictures wherein swords and armor are part of the paraphernalia.

A Chinese scimitar is shown in Fig. 2. The handle of this sword is oval and covered with plaited cord. In making this scimitar, follow the directions as for Fig. 1, except that the handle has to be covered with a round black cord. If it is found difficult to plait the cord on the handle as in the illustration, wind it around in a continuous line closely together, and finish by fastening with a little glue and a small tack driven through the cord into the handle. The pommel is a circular

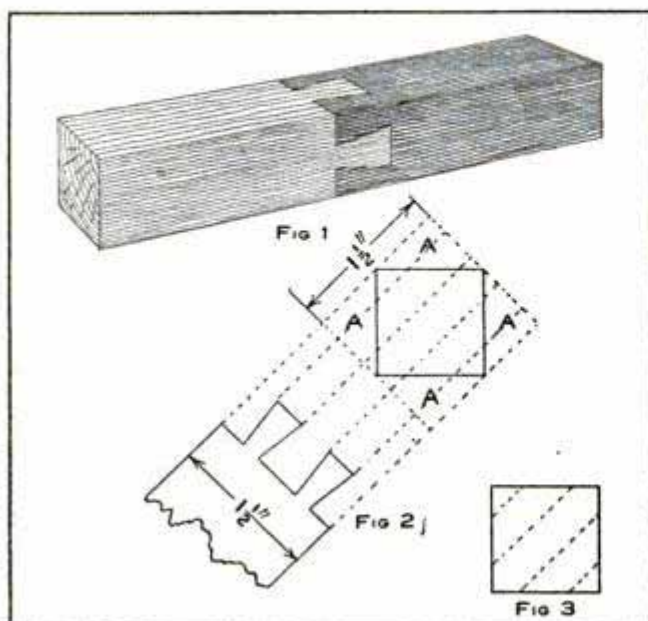
piece of wood,  $\frac{1}{8}$  in. thick and 5 in. in diameter. The length of the handle, allowing for a good hold with both hands, should be about 9 in., the length of the blade 28 in., the width near the pommel  $1\frac{1}{2}$  in. and 3 in. in the widest part at the lower end. The sharp or cutting edge is only on the short side, the other is flat or half-round.

A Turkish sabre of ancient manufacture from Constantinople is shown in Fig. 3. The handle is painted a dull creamy white in imitation of ivory. The enamel paint sold in small tins will answer well for this purpose. The cross guard and blade are covered as described in Fig. 1. The sharp edge is on the longer curved side, the other is flat or half-round.

A two-handed sword used in the 14th and 15th centuries is shown in Fig. 4. This sword is about 68 in. long, has a cross guard and blade of steel with a round wood handle painted black. The ball or pommel on top of the handle is steel. Both edges of the blade are sharp. This sword is made in wood the same as described for Fig. 1.

### A Dovetail Joint Puzzle

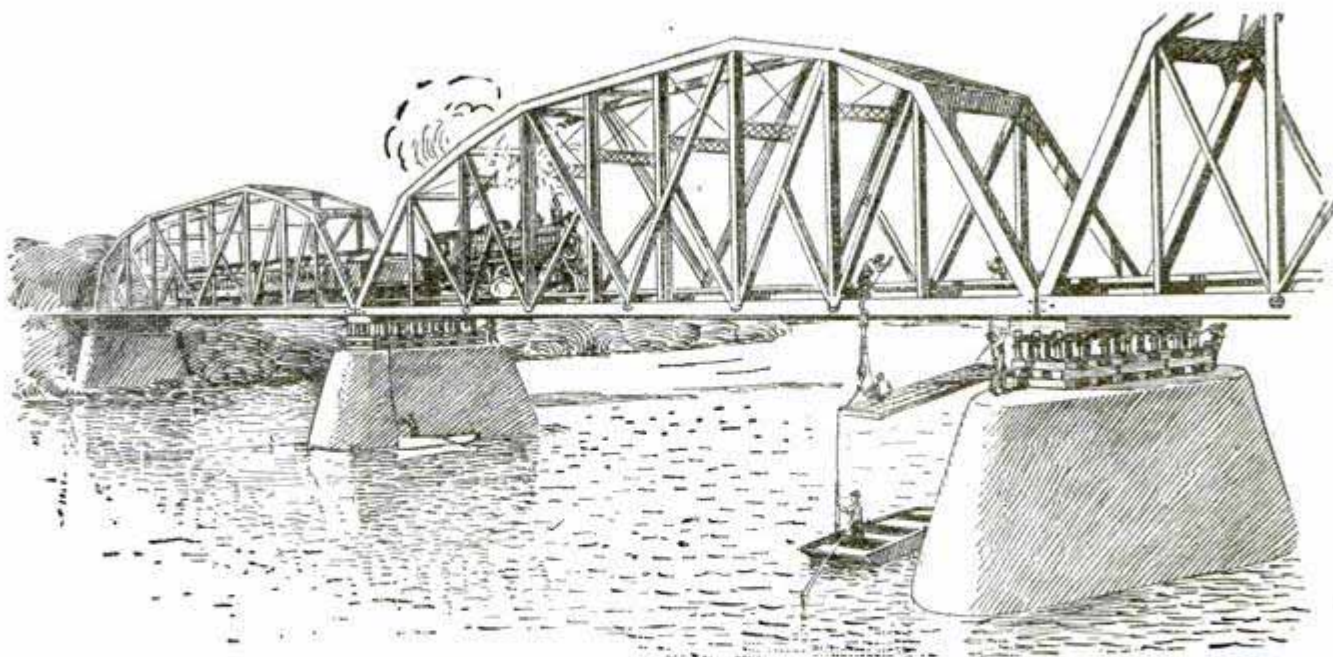
A simple but very ingenious example in joinery is illustrated. In the finished piece, Fig. 1, the dovetail appears on each side of the square stick of



How the Joint Is Cut

wood, the illustration, of course, shows only two sides, the other two are identical. The joint is separable and each part is solid and of one piece. In making, take two pieces of wood, preferably of contrasting colors, such as cherry and walnut or mahogany and boxwood, about  $1\frac{1}{2}$  in. square and of any length desired. Cut the dovetail on one end of each stick as shown in Fig. 2, drive together and then plane off the triangular corners marked A. The end of each piece after the dovetails are cut appear as shown in Fig. 3, the lines marking the path of the dovetail through the stick.

Pure rain water is the best to use in a cooling system of an automobile engine, as it is free from the mineral substances which are deposited in the radiator, piping and jackets by hard water.



Raising a Bridge a Few Inches a Day

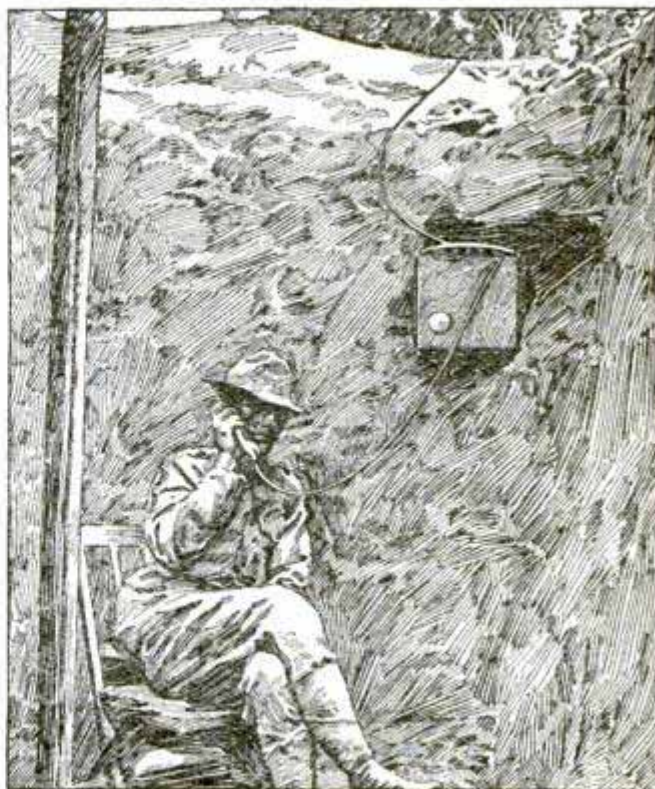
### RAISING RAILWAY BRIDGE WHILE TRAINS CROSS IT

A remarkable engineering feat has been accomplished by the Union Pacific Railroad in the raising of its bridge across the Kaw river at Kansas City while more than 50 trains a day passed over it. The bridge is in three spans, resting on four stone piers, each span having an estimated weight of 1,500 tons. The task was accomplished with a number of hydraulic jacks, each capable of lifting 200 tons. These were placed on the piers under the structural work. One side of the ends of the spans resting on one pier was raised about 8 in., and then the other side raised the same distance, this program being repeated on each pier. The bridge was thus slowly raised to an additional height of 4 ft. at the rate of a few inches a day.

### TELEPHONING FROM TARGET PIT

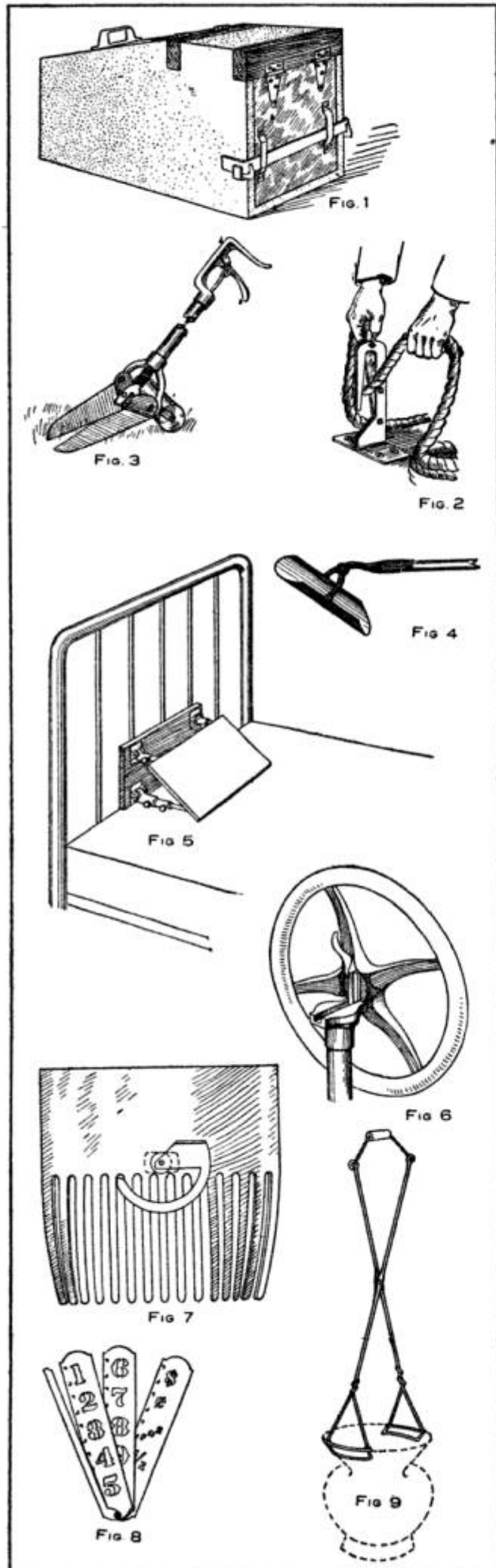
This illustration shows the pit end of a target range telephone line installed for the national guard on a range in Kansas at a cost of \$42. Dry batteries are used as a source of current, the wires are strung on posts set at each 100-yd. line of the range as distance markers, and the telephone apparatus

consists of pairs of what are known as "troubleman's hand telephones," these consisting of a transmitter and receiver in series, attached to a conveniently arranged handle. Successful communication is maintained between the chief officer on the firing line and the man in charge of the target pit, enabling the field officer to obtain the scores of each man immediately after firing. The length of the range is 3,000 yd.



Pit Telephone of Rifle Range

## RECENT



**CONCRETE GARBAGE BOX.**—The garbage box shown in Fig. 1 is made of concrete. Among the claims advanced for it by its inventor are that it is too heavy to steal, cannot wear or rust out, and cannot be overturned. It is 34 in. long, with walls 2 in. thick, and is provided with galvanized iron doors. It occupies a fence opening 23 by 23 in.

**ROPE-CUTTING DEVICE.**—The rope-cutting device in Fig. 2 is simple and effective. It is composed of but two parts—a knife and a frame. The knife is of tool steel and can easily be removed and sharpened when necessary. The frame, which stands about 10 in. high, is finished in red enamel. The complete cutter weighs about 2 lb.

**LONG-HANDLED LAWN TRIMMER.**—Figure 3 illustrates a new lawn trimmer which enables the operator to cut the grass around flower beds, sidewalks, trees, etc., without stooping. A roller holds the clippers slightly above the ground, and the cutting movement is accomplished by the working of a rod and spring which runs through the handle from the base to the top. The handle is shortened in the drawing because of lack of space.

**ADJUSTABLE DRAIN CLEANER.**—The drain cleaner shown in Fig. 4 can be adjusted to any angle. The handle is about 6 ft. long, and the instrument is especially adapted for finishing ditches in which tile are to be laid.

**INVALID'S FOOT-REST.**—Figure 5 shows a spring foot-rest for invalid beds. It is made in such a manner that the part against which the feet are placed can be extended to different distances as well as different angular positions.

**ADJUSTABLE STEERING WHEEL FOR AUTOS.**—Very little space is allowed to go to waste between the driving seat of an automobile and the steering wheel, even when the steering shaft is hinged at the base so that it can be pushed upward. In this arrangement (Fig. 6) the wheel is hinged as well as the shaft, thus giving an additional few inches of passage room.

**LOCK FOR SIDE AND BACK COMBS.**—Losing side and back combs, a misfortune that often happens, is made practically impossible if these articles are provided with a lock of the nature shown in Fig. 7. It is a hair engaging hook pivotally mounted on the comb, and provided with a spring to hold it in place.

**COMPACT SET OF FIGURE STENCILS.**—Figure 8 illustrates a handy arrangement of figure stencils. They are arranged on three strips, pivoted at one end in such manner that they fold together like the sticks of a fan. At one edge of each strip are angular gauge perforations horizontally aligned with the upper and lower ends of the figures. These are used to aid in the alignment and spacing of the figures to be stenciled.

**CUSPIDOR CARRIER.**—The task of handling cuspidors is uncongenial under any condition, but the carrier shown in Fig. 9 makes it a little less so. It consists of two engaging rods with connecting chains and handle at the upper end and grips at the lower. Its method of operation is clearly shown in the illustration.

**MOVING-PICTURE TOY.**—Figure 10 is a moving-picture toy of simple design. It comprises a rotary shutter or disk, provided with two slits, at one end of the frame, and a movable band of pictures in the form of a wheel rim at the other end. This band rests on a pulley spool at the end of the shaft. The spectator of the toy picture exhibition looks through the slit in the disk, and at the same time draws the fingers of his left hand over the shaft, causing it to revolve. The revolutions of this shaft in turn causes the picture wheel



## PATENTS

to whirl, this action bringing the pictures before his vision in rapid succession, and giving an impression of action to the figures.

**FULCRUM ATTACHMENT FOR FORKS AND SPADES.**—Much of the back breaking energy required in using an earth fork or spade is expended in the dislodging of the load from the ground after the fork or spade has been inserted, which means a severe strain on the shoulder and back muscles. The attachment shown in Fig. 11 lessens this labor by providing a fulcrum. By simply pulling the handle backward the load is dislodged, the fulcrum bearing the strain instead of the muscles.

**RIMMED PROPELLER.**—A propeller with several novel features is illustrated in Fig. 12. As is well known by small boat builders, the tip of the blade is the most efficient portion, so the extra blades cast on the rim tend to greater efficiency. The boss is also provided with screw blades. Experimental trials with the propellers have been carried out, it is understood, with excellent results.

**EMERGENCY HORSESHOE.**—Figure 13 is a horseshoe for use in such emergencies as ice or other very smooth surfaces. The bearing surface is provided with extra-large calks, and the whole is fastened solidly to the hoof by means of hinges and straps.

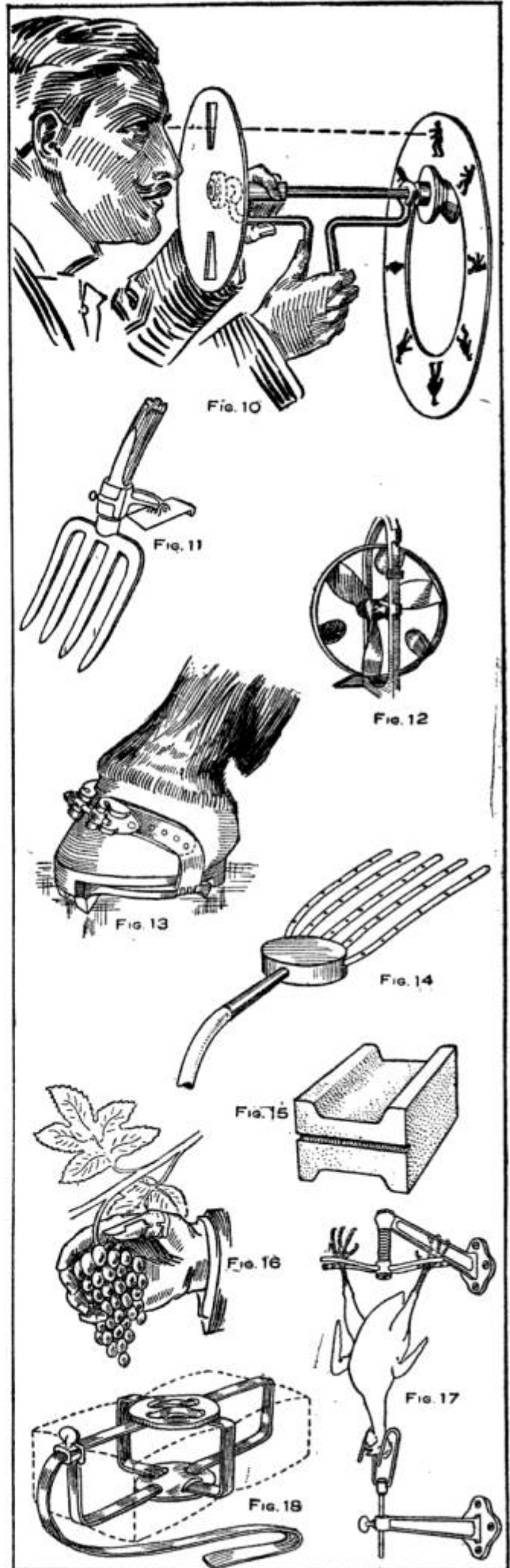
**DEVICE FOR DRYING THE HAIR.**—The device in Fig. 14, designed for drying the hair, is composed of a number of perforated tubes, arranged like the prongs of a fork. These tubes are pushed into the hair close to the scalp, connection is made with a supply of compressed air, and this, escaping through the perforations, accomplishes the drying in a short time.

**CONCRETE WAGON-TRACKS FOR ROADS.**—Figure 15 illustrates a concrete road block designed to provide a smooth, unbroken surface in a road for heavy vehicles, thus eliminating the ruts made by such traffic on ordinary roads, as well as furnishing excellent running. Placed in two parallel lines, at the right distance apart to receive the wheels of standard vehicles, they compose a grooved wagon track upon which the wheels will cling. As shown in the illustration, the blocks are provided with means for interlocking engagement with adjacent blocks. Such a road would be used by vehicles in the same way that street car tracks are used in streets traversed by them.

**GRAPE PICKER.**—The thimble device shown in Fig. 16, is in reality an artificial thumb nail with which to pinch bunches of grapes from the vine. It is secured to the thumb by means of a plate and strap, and makes picking simple and quick.

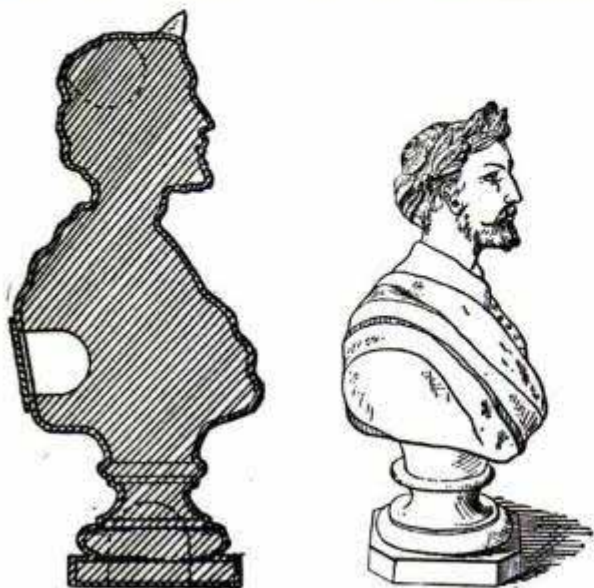
**POULTRY-PICKING FRAME.**—Figure 17 is a rack to which a fowl is attached for picking. The upper bracket is provided with a spreader in which the legs are hooked, and the lower bracket has a hook which engages with the neck of the fowl. The spreader is attached to the upper bracket by a spring, which allows it to give slightly, and the hook of the lower bracket is extensible, to accommodate fowl of different sizes.

**LETTER-TYING DEVICE.**—With the knowledge that the U. S. government is seeking a machine that will tie packages, many inventors are exerting their energies in that direction. The device in Fig. 18, however, does away with twine as well as tying machines. It is a package tie of leather or canvas, provided with two parallel slots through which the straps run, and a clip for fastening the strap after it has been tightly drawn about the bundle. In operation, the strap and slots are quickly slipped over the bundle and a pull on the end of the strap and a tightening of the clip completes the operation.



## RELICS FROM THE ARCHIVES OF THE PATENT OFFICE

**URN FOR THE ASHES OF THE DEAD**—The Patent Office is a museum of records of human thought which for variety and extent has no equal. One would think that after having canvassed



the various activities of life and of death, the gamut of invention would have been fully compassed, but not so. The annexed illustration is an example where the inventor seeks to keep alive the memory of the dead in a way which furnishes for the home unique specimens of bric-a-brac and dispenses with the cost of a cemetery lot. The inventor proposes to form a bust or statue in the image of the deceased person and to provide such statue with a pocket in its back, or in its head, which shall have a closure plate and within which pocket are to be kept the ashes or cremated remains of the deceased. The inventor says, "The receptacle or urn may be made of cast material or the usual alloys for casting statues, such as bronze and the like; but I prefer it of marble. The ashes of the dead are thus not only securely preserved in a manner by which they can be readily retained by relatives and friends in the household, but are so kept that their presence will recall only pleasing recollection of the departed."

This invention was patented by Eli C. Townsend, Sept. 28, 1880, No. 232,782, and, as the patent has long since expired, the invention is now public property.

**TAPE WORM TRAP**—Isaac Walton was a past grand master in the art of fishing, but in all his 90 years he probably never thought of going fishing in the human stomach. In U. S. Patent No. 11,942, granted Nov. 14, 1854, to A. Myers, of Logansport, Indiana, this proposition was seriously advanced and received the sanction of the Patent Office. The particular game was tape worms. The tackle consisted of a small gold cylindrical casing, not as large as a thimble, which was baited interiorly and had a string attached to it and was designed to be swallowed. The outer casing had a hole in its side and within the casing a sliding sleeve with serrated edges was arranged to spring upwardly across the opening from the action of a subjacent spiral spring. The serrated sleeve being locked down by a trigger arrangement, the trap was baited and swallowed, the patient first having fasted long enough, as the inventor naively says, to make the worm hungry. Then when the tape worm inserted his head through the opening, the serrated sleeve would automatically spring up and catch the worm, and if the patient was a good fisherman all he had to do was to pull up his catch.



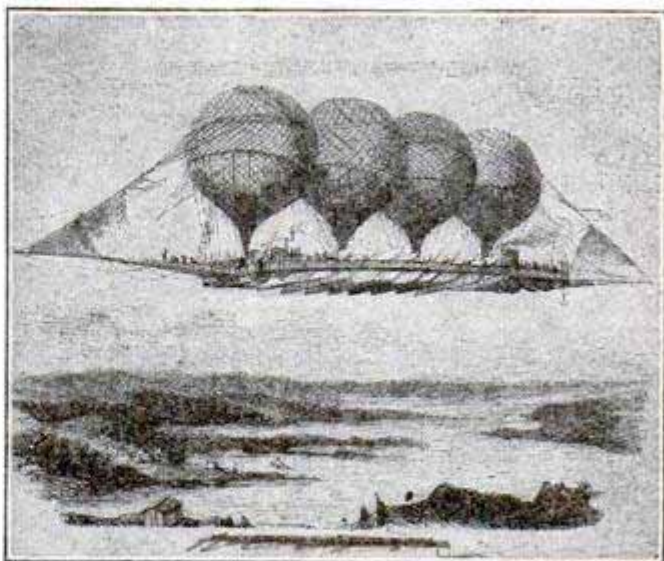
**PORTABLE SHOPPING STOOL**—The greatest discomfort which the bargain counter shopper has to endure is the necessity of having to stand. The illustration presents an invention in which every shopper carries her own stool. It is a light skeleton frame with a waist belt that is strapped around the waist and is carried underneath the skirt like a bustle. The two pairs of legs of the stool are far enough apart to avoid interfering with the feet in walking and when the wearer desires to stop and rest, all she has to do is to stoop a



little, and she is then supported by the stool. This patent was granted to Ivy Baldwin of San Francisco Dec. 14, 1886, No. 354,298 and having expired is now public property. The inventor does not say just how it would work in a street car, and it is possible that the contingency of a backward somersault may have prevented this invention from coming into general use.

**AIRSHIP OF VINTAGE OF 1850**—This ship was designed by M. Petin, a Frenchman, some 50 years ago. Its size and dimensions are something extraordinary, the framework being 486 ft. long and supported by four balloons each 90 ft. in diameter. The steering was accomplished by the jib-like sails fore and aft, and the elevation was regulated by the buoyancy of the balloons as affected by the series of planes in the body of the framework, the planes in the cut being set at an angle to cause the ship to descend. The motive power was supplied by the four wheel-like propellers beneath the first balloon and they were run by steam.

An equipment of four parachutes was carried, each parachute being capable of sustaining a dozen persons. The remarkable features about this ship are that it was designed when balloons were a novelty and when



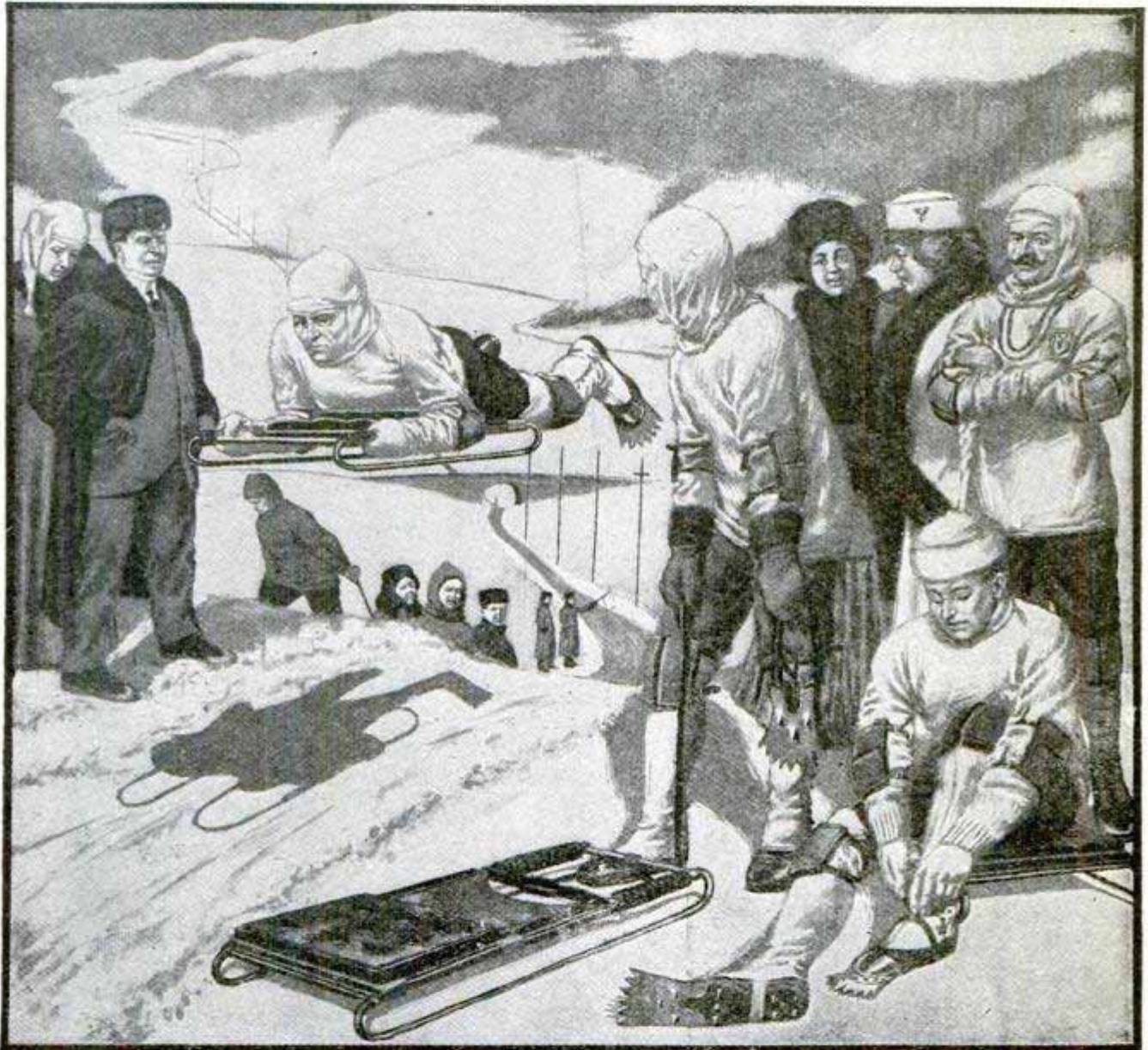
no thought had yet been given to the principles of aeroplanes and yet the two principles were combined in such a practical and coactive manner and on such a gigantic scale.

## TOBOGGANING AT ST. MORITZ

The famous toboggan run at St. Moritz, in Switzerland, is one of the finest in the world. It is scientifically constructed, has a running surface of ice, and the corners are banked very high. The end terminates in a sharp, steep hill, and if the run has been a fast

## THE U. S. AEROPLANE OFFICERS

During the month of October the officers of the aerial corps of the United States army assigned to duty as navigators of the air in the first army aeroplane, purchased from the Wrights, were given their first real flying les-



Web-Footed Tobogannners

one, the sled leaps over the crest as shown in the illustration and runs out upon the soft snow. The speed is terrific, and to make possible some control of it the tobogganers have saw-toothed protuberances attached to the soles of their shoes. The teeth project from the toes, giving the wearers a web-footed appearance.

sons. Wilbur Wright, as instructor, made flights every possible time during the month, taking one of the officers with him each time. Before the end of the month, Lieutenants Lahm and Humphry had become sufficiently expert to fly alone, and on Oct. 25 both made their first unattended flights.

### PICTURES OF THE "REPUBLIQUE" DISASTER

The story of the "Republique" accident, a disaster which robbed France of four of its aerial army officers and cast the entire country into a gloom like that of a great defeat, was told in the November issue, but words fail to tell the story as clearly and graphically as these illustrations.

They show the dirigible airship falling after the gas bag exploded, the condition of the wreck a moment after it struck the earth, a physician declaring the death of Lieut. Chaure a few minutes after his fall, the broken propeller blade that caused the accident, and the removal of the burst gas envelope.

So roused have the military aerial experts of France become over the accident, and the fear that it may result again from the same cause, that

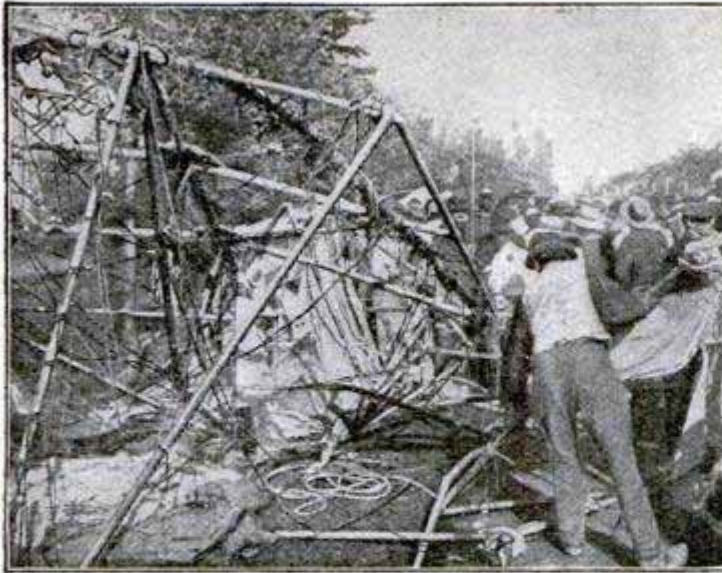
it is quite probable that considerable changes will be made in the construction of the gas envelopes. The most important change will be the divisioning off of the envelope into compartments, the tearing open of any one of which will not prove disastrous, as the others will sustain the airship until a landing is made. This idea was adopted in the Zeppelin type of dirigible, while the French and American army dirigibles still have envelopes of but one long compartment.



Removing the Torn Gas Envelope



The Broken Propeller Blade



Courtesy L'Illustration, Paris

The Final Wreck of the "Republique"—Declaring Lieutenant Chauré Dead

## POLAR COMMISSION APPOINTED

The commission appointed by the National Geographic society to determine the momentous polar question is made up of twelve men of worldwide standing. The chairman is Henry Gannett, chief geographer of the U. S. geological survey, vice-president of the National Geographic society, and one of the founders of that society in 1888. He is the author of topographic surveying books, statistical atlases of the tenth and eleventh censuses, the dictionary of altitudes, and many other works.

The other members of the commission are O. P. Austin, chief of the government bureau of statistics and author of books on territorial expansion; Dr. L. A. Bauer, director of terrestrial magnetism of the Carnegie institute, and astronomer and magnetic computer of the United States from 1887 to 1892; Rear-Admiral Colby M. Chester, known for many years as one of the best navigators in the naval service; Frederick V. Coville, botanist of

the department of agriculture and author of many scientific reports; Dr. J. Howard Gore, formerly professor of mathematics in George Washington university and an author of works on



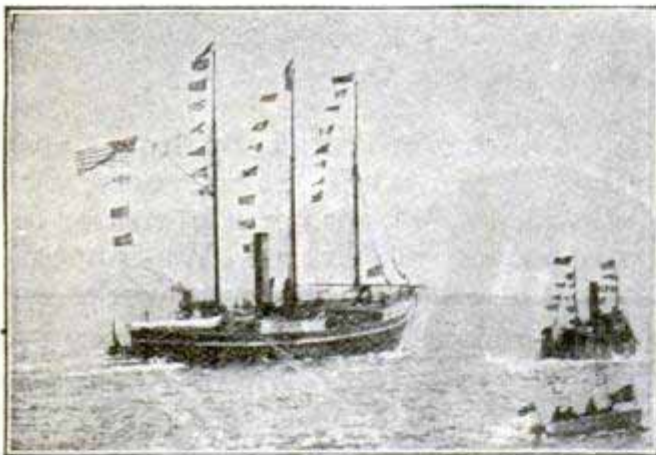
Courtesy L'Illustration, Paris

Destruction of the "Republique"

geography; G. H. Grosvenor, editor of the National Geographic magazine; C. Willard Hayes, chief geologist of the U. S. geological survey and a pioneer explorer in Alaska; Alfred J. Henry, professor of meteorology in the U. S. weather bureau; W. H. Holmes, chief of the bureau of ethnology of the Smithsonian institute; Dr. C. Hart Merriam, chief of the U. S. biological survey; Dr. O. H. Tittman, superintendent of the U. S. coast and geodetic survey, and member of the Alaska boundary commission.

### THE "ROOSEVELT'S" ARRIVAL AT SIDNEY

The "Roosevelt," Peary's Arctic ship, with the commander and his party on board, is shown in this illustration as she was entering Sidney,



Peary's Arrival at Sydney

Nova Scotia, on the return from the North Pole. The flag-bedecked vessel slightly forward and to one side of her was bearing the reception committee.

### PANAMA CANAL HALF EXCAVATED

The grand total of canal excavation down to the first week of October was 87,494,537 cu. yd., just one-half of the total excavation to be made for its completion. Of this great amount 64,738,051 cu. yd. was excavated since Jan. 1, 1908, as compared with the 22,756,486 cu. yd. excavated in the four previous years of American possession.

### LATHAM FLIES IN 40-MILE GALE

Attains Speed of Over 80 Miles an Hour

A speed of over 80 miles an hour at moments, in a gale that reached a velocity of 50 miles an hour in gusts, was accomplished by Herbert Latham in England on Oct. 22. It was the next but the last day of aviation week at Blackpool, near Manchester, and such aviators as Farman, Rougier, and Paulhan watched in amazement and fear.

The flight was the most daring ever attempted, causing a division of opinion among the other aviators present as to whether his success should be attributed to the luck of fools, or that the abilities of the heavier-than-air machine have hitherto been underestimated.

At times the monoplane seemed to stand still, while at others it was driven at a rate estimated to have been between 80 and 100 miles an hour. Its behavior in the gusty wind was singularly birdlike, tilting at every conceivable angle, and rolling, rocking, and drifting in a manner sufficient to make Farman and the others consider the foolhardy aviator's life as nearly spent. There were moments when, with its head to the wind, the machine actually moved backward in relation to the land beneath, and at times it took a course sideways and had a long and difficult task to get around to the wind. Once it got the wind fairly behind it and streaked through the sky in an amazing fashion. It covered 1,300 yd. in 30 seconds, according to one timing, and Latham himself believes he was making 100 miles an hour. When he landed, the admiring aviators and spectators crowded around and overwhelmed him with congratulations, punctured with, "Don't ever do it again."

By the flight he won a special prize of \$1,500 for the finest flight of the meeting, but his chief reason for daring the storm was the fact that he had promised Grand Duke Michael the opportunity to see him fly on that day, regardless of weather conditions.

## LAMBERT SOARS OVER EIFFEL TOWER

**Flies High Above Paris Boulevards and Buildings in Wright Aeroplane—Reaches Altitude of 1,300 Ft.—Covers a Distance of 31 Miles all Told**

When Bleriot, in his dragon-fly monoplane, flew across the English channel from Calais to Dover the world hailed his feat as the greatest then accomplished in a heavier-than-air aerial craft. How greater then must be the accomplishment of Count de Lambert in his Wright biplane.

On Oct. 18 he rose from the aerodrome at Juvisy and flew towards Paris, a distance of about 13 miles. Undismayed by the buildings and busy activity below him he maneuvered over the French capital at a height of 400 ft., and still not satisfied with a feat already unparalleled, circled higher and higher until he had soared several hundred feet above the Eiffel tower. Thousands who watched from the streets of Paris could hardly credit their senses as they saw the tiny object high above the tower, and 1,300 ft. above them, in the most remarkable and daring flight ever attempted.

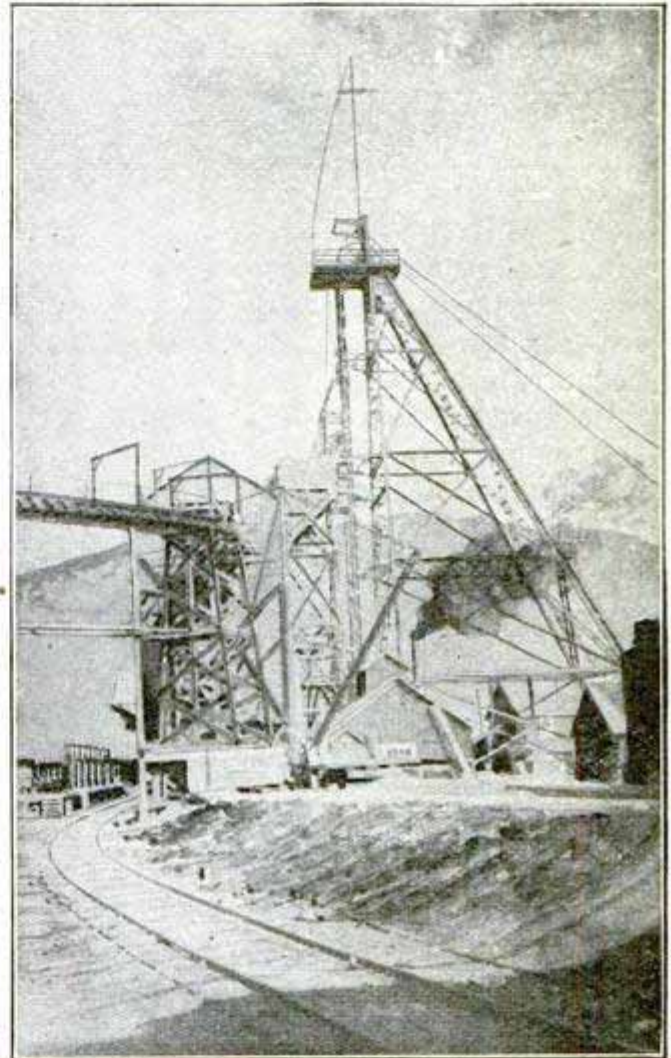
Then, leaving impressionable Paris in a frenzy of excitement, the Russian-French aviator in his American machine flew back to Juvisy, the time consumed being 49 min. 39 sec. Here he was given a wild reception, Orville Wright being the first to congratulate him. The crowds cried "Long live Count de Lambert," "Long live France," "Long live Russia," and he answered, "Cry long live the United States, for it is to her that I owe this success."

The sensation created was far more intense than when Santos Dumont circled the structure in his dirigible in 1900, a feat that at that time was as wonderful, considering that it was the first real flight of a propelled aerial craft of any kind.

A parcel-post arrangement has been made with Dutch Guiana by which such packages are now admitted to the mails for that country.

## MINE VISITED BY PRESIDENT TAFT

While President Taft was in the vicinity of Butte, Montana, on his tour of the United States, he visited the



Leonard Mine which President Taft Visited

Leonard mine and drilled rock 1,600 ft. below the surface. The background of the mine photograph is the Rocky mountains.

## EXHIBITION AERIAL FLIGHTS

Following the short and not extraordinary flights of Wilbur Wright and Glen Curtiss at New York during Hudson-Fulton week, Wright made the announcement that it was the last exhibition of the kind he would enter, and that neither he nor his brother wished to be looked upon as showmen. Their efforts in the future will be de-

voted to the commercial exploitation of the machines.

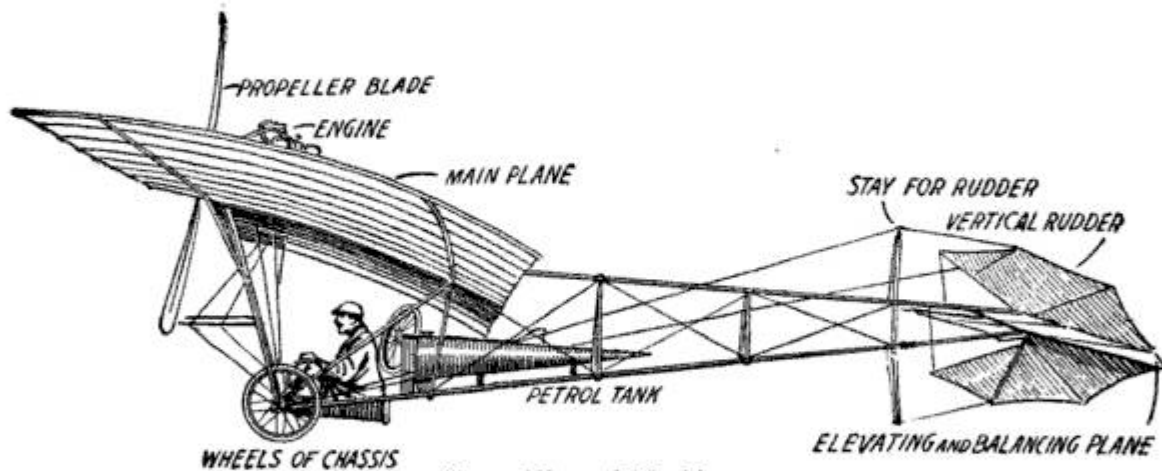
Curtiss and Baldwin, however, appeared for flights in St. Louis, Chicago, and other cities of the country after the New York festivity, believing that such exhibitions are one of the best ways of commercially exploiting their inventions, rather than simply a show business.

### ENGLAND'S AIRSHIP FRIGHT

According to a report from England, the stories told of airships seen flying over that country at night was taken advantage of by an automobile firm to perpetrate a hoax that added for some time to the terror of a certain class. It consisted of flying a small captive balloon in the form of an airship, the ground end of the rope holding it captive being attached to a slowly moving automobile. The balloon displayed a light, and the illusion was heightened by the open muffler of the auto.

### SANTOS-DUMONT GIVES AEROPLANE PATENTS TO WORLD

Santos-Dumont, who was the first man to construct a dirigible airship which really flew any distance at all, and of whom the world at large has heard but very little for the past few

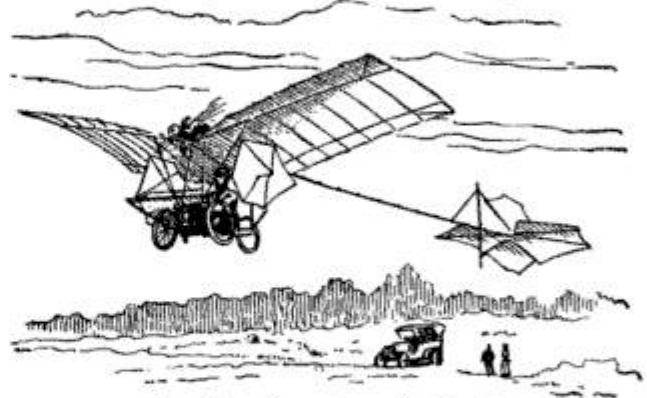


Closer View of Machine

years, has at last designed an aeroplane that will fly, after several years of unceasing struggles.

His machine, which he calls the

"Demoiselle," (French for dragon-fly) is the smallest flying-machine in the world. Its weight is only 259 lb. including the pilot and the 30-hp. motor.



Smallest Aeroplane in World

Its surface measures only 96 sq. ft., as against the 570 sq. ft. of a Wright machine. The total cost of machine and motor is less than \$1,000.

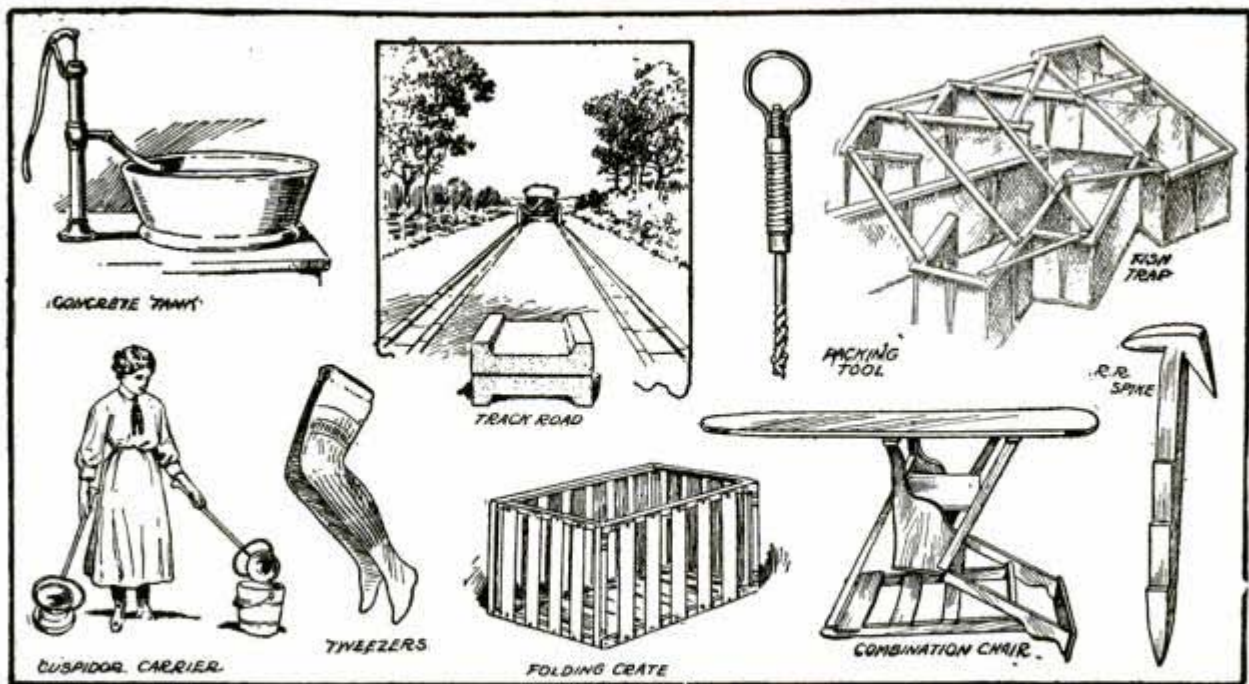
The inventor has made several successful flights with his little machine. In one he flew from St. Cry to Buc, a distance of five miles, in five minutes, which is a greater speed than that which won Curtiss the aviation cup at Rheims.

The patent rights of the machine have been turned over to the public by Santos-Dumont in order to encourage aviation, and anyone may use his plans to construct a similar machine.

An electrical earthquake alarm has been invented by a Tuscany scientist. It consists of a coherer, a sensitive gal-

vanometer, and a battery, connected to a buried metal plate. A registering and alarm mechanism announces the coming disturbance.





## PATENTS AS MONEY MAKERS

Hearing so much of the vast fortunes made by such famous inventors as Howe, Edison, Westinghouse, Morse and Bell, it is doubtful if the average person ever stops to think of the sums which must be made every month from the sale of articles invented by less prominent persons. What this sum amounts to can be imagined when one takes into consideration the returns to even a few individual inventors of the present day.

Take, for example, the articles shown in the illustrations. These were all patented through a single firm of attorneys during a relatively short time, yet they represent a very considerable showing financially.

The concrete tank in the first drawing is the invention of Mr. J. F. Willey, of Versailles, Ill., and at first glance would seem to differ little from other tanks. As a matter of fact, its advantages lie not so much in the tank itself, as in the method of construction. Concrete tanks are used largely by farmers, but when one is hauled over a rocky road, it is very likely to break. On the other hand, if it is moulded near the pump, a large and cumbersome mould must be hauled about at considerable expense. These very points perplexed Mr. Wil-

ley until he hit upon a novel idea. He dug a mould for the tank in the earth, bottom side up, poured in the cement and when set, dug up the tank with a spade, turned it over and had the completed article right at the pump. He obtained a patent on the idea and now has agents making the tanks in practically every State in the Union, with substantial financial returns to himself.

Another cement novelty is shown in the second cut. It is a road built of concrete blocks, which can easily be taken up or put down. The blocks are exactly alike on both sides, and the idea is that when one side is worn the block can be turned over and the other side put into use, thus obtaining a double life. The block is the invention of Mr. H. H. Dickson, of Orlando, Florida. Being especially adapted for use in sandy roads, it has already been adopted in sea-coast States. Mr. Dickson can put down his road at a much lower figure than macadam with a better profit to himself.

The little tool for engineers is designed to remove packing from stuffing boxes of engines. It has a spiral handle so that it can be bent out of the way of the cross-head, etc., and yet be screwed into the old packing. The Canadian patent on this lit-

tle article brought an offer of \$1,000, and the inventor, Mr. Haden Bales, Ashcroft, B. C., is making them for the U. S. market.

Mr. J. R. Heckman, of Ketchikan, Alaska, improved the old style of floating fish trap simply by fastening the surface logs tightly together instead of chaining them. This did away with scaring the fish by the moving logs, and also made it impossible for the logs to roll when the net webs were being set. Two patents covering this trap brought returns amounting to \$85,000 in one year.

The simple article for washing cuspidors brought \$3,400; and Mr. E. C. Wells of Waterville, Vermont, whose novelty in tweezers is shown in the illustration, sold an interest in the patent for \$1,000 even before the application was allowed.

Mr. Edwin Alls of Maryland, sold a patent on a furnace at a good profit before the patent issued, and Mr. W. H. Stow, of Michigan, as readily disposed of a novelty in theater chairs.

The illustration shows a folding crate patented by W. A. Tomison, Winnsboro, Texas. He has sold 300 a month at two dollars each.

Mr. D. W. Hook of Loweville, N. Y., is the inventor of the combination chair shown in the drawing. These chairs, which can be converted into ten different articles of furniture, are being sold all over the United States and are bringing the inventor excellent returns. So simple an article as a railroad spike would seem too small for the attention of large manufacturers, yet the invention of Mr. Fred Kohagen of Detroit, is being made by the Northern Spike Co., a \$200,000 corporation.

These and many other patents have proved money makers for their inventors, but it is probably the case that the manner in which the patents themselves were obtained is responsible in no small part for their success. There are of course valuable and worthless patents just as there are good and bad articles in all other lines, and it may often be the case that, although the

idea itself is a good one, the patent when obtained does not grant sufficient protection to make it salable or to warrant manufacture under it.

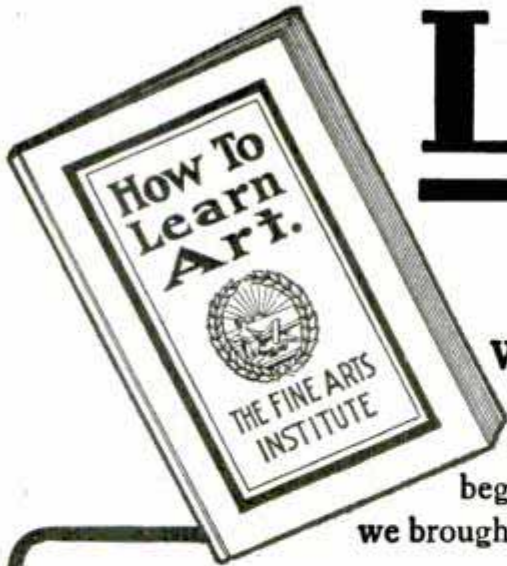
It is a significant fact that the successful patents mentioned in this article are exceptionally broad. The patent covering the packing screw contains the broad claim: "A packing tool including a handle consisting in part of a helical spring," and the fish-trap patents are of equal scope.

A surprising point is the very short time in which these patents were obtained. The first was secured in about two months, and the Heckman patent in fifteen days.

A very interesting set of booklets clearly explaining the difference between broad and narrow claims and just why some patents are valuable and others worthless, are issued by Messrs. Woodward and Chandlee, a firm of Attorneys who are well known to many readers of POPULAR MECHANICS. This firm obtained all of the patents referred to in this article. The books mentioned also tell what may be patented and who may obtain a patent; the course which an application takes through the Patent Office and what should be done if anyone tries to steal your invention. One of the best things about them is that they are issued for free distribution and are mailed to anyone on request. One of the booklets gives an interesting list of suggestions as to what to invent.

Messrs. Woodward & Chandlee are located in the Bornot Building, 1255 F St., Washington, D. C.

In addition to issuing their books for free distribution, they give an opinion as to the patentability of any invention submitted to them without charge. The inventor need only send them a rough sketch and description of his invention to obtain this service. All work entrusted to them is given the most careful and conscientious attention, and they are always ready to give any information relating to patent practice. Their booklets should be in the hands of everyone interested in any way in patent matters.



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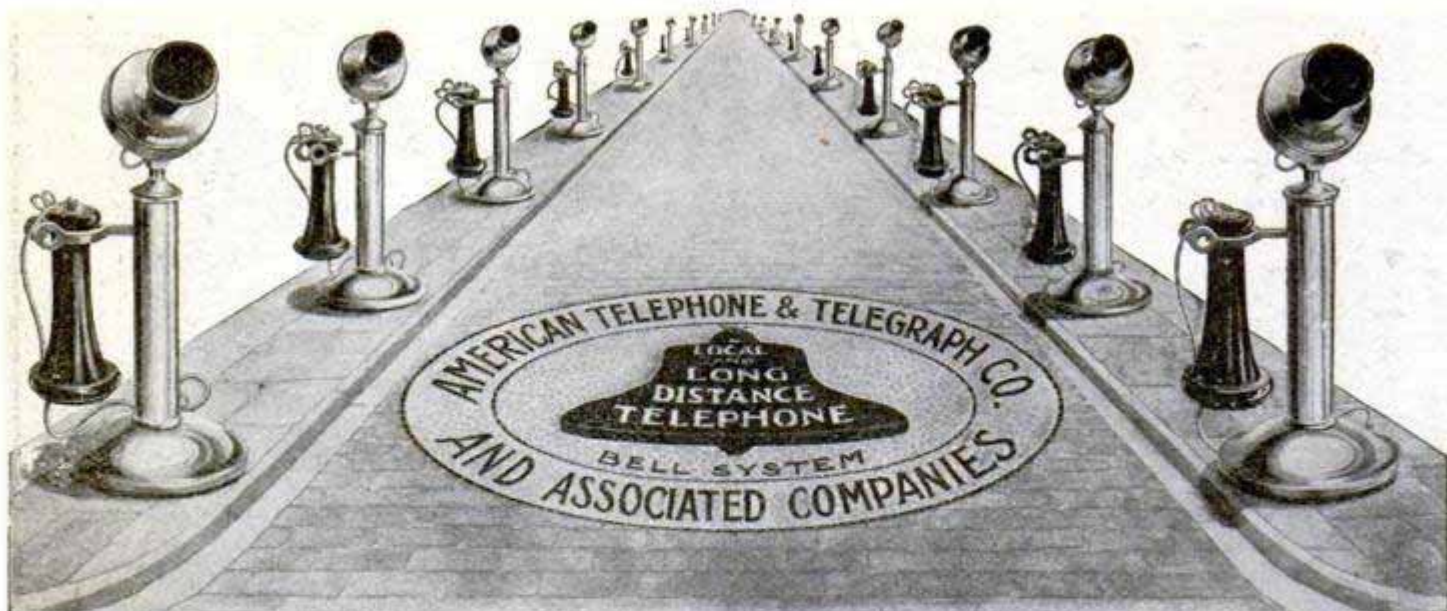
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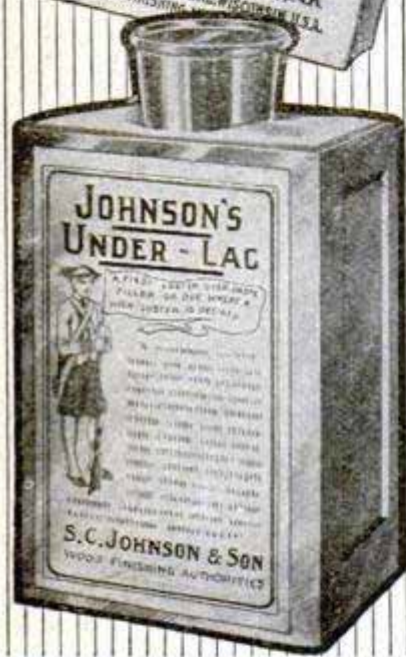
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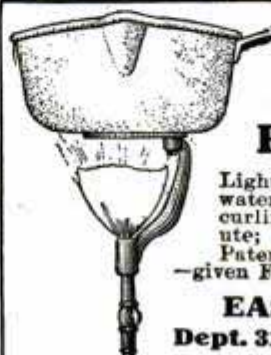
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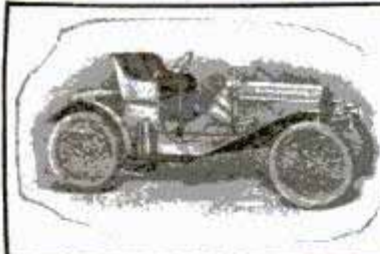
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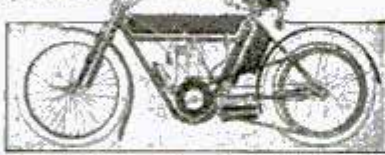


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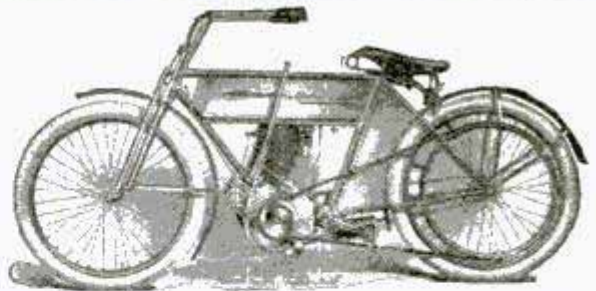
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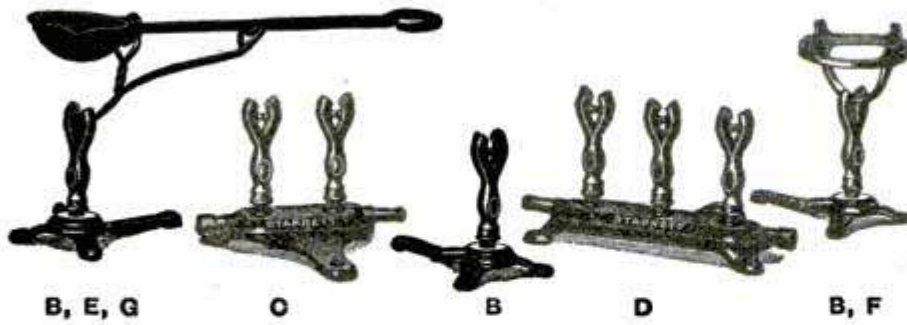
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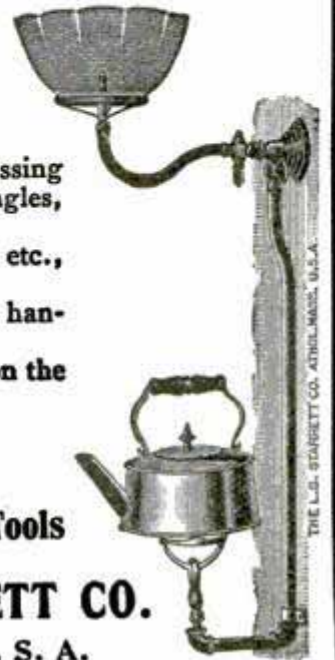
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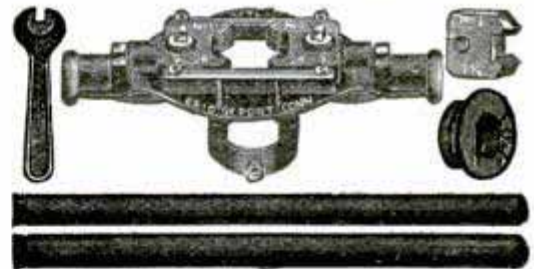
**"EASY DIGGING"** describes fully the IWAN Patent Post Hole and Well Auger. The best earth auger for fence and telephone post holes, shallow wells, and all other holes in the ground. Will not bore in rock, but cannot be surpassed for ordinary soil. Sizes 3 to 14 inches in diam. Hardware and implement dealers sell them. Write at once for above booklet and prices on all our line.



**IWAN BROTHERS**  
Mrs. of Post Hole Diggers, Drain Cleaners, Hay Knives, Tiling Spades, Chimney Tops, etc.  
**SOUTH BEND, IND.**

Dept. M

**DRIVING THE NEW CAR HOME.**—In former years the purchaser of a car who elected to drive it from the factory to his home nearly always belonged to the class whose places of residence were within a reasonable distance of the factory. Of late, however, says Automobile Topics, distances have been increasing, and longer and longer journeys are undertaken and carried out successfully. An illustration of this is the case of former Mayor Ezra Thompson, of Salt Lake City, who recently purchased a car in Buffalo.



**Genuine Armstrong Stock and Dies**  
Are Standard in Workmanship

Manufactured only by  
THE ARMSTRONG MFG. CO., 315 Knowlton St., Bridgeport, Conn.

## Whatever You Do—Do With Good Tools



PLIERS DESIGNED FOR

- Householders
- Autoists
- Manufacturers
- Mechanics
- Jewelers
- Electricians
- Linemen
- Plumbers
- Shoemakers
- Blacksmiths
- Farmers
- Milliners

Look for the mark.

## Utica Pliers

and nippers are made to fill every requirement in material, workmanship and design. Drop forged, all high-grade steel. They are guaranteed not to bend or break under work. Tempered to the right degree of hardness in wearing surfaces and cutting edges. They will cut cleanly a sheet of paper and snip with ease a steel wire nail.

Sold at Hardware and Electrical supply stores. If your dealer does not carry them let us know and we will see that you are supplied. If you are interested send us your dealer's name and we will be glad to mail you absolutely free our handsomely illustrated booklet "Plier Palmistry," which covers the entire subject of the plier and its uses.

UTICA DROP FORGE & TOOL COMPANY

Dept. 11

UTICA, N. Y.

Wire Cutters

Screw Driver End

# Your Boy Wants a Bench

Ask your boy if he wouldn't like a nice home bench so he could make things like papa. When his face lights up with eager anticipation, and he cries, "Oh! yes, papa," you'll know we are right when we say, "Your boy wants a bench." And he wants a good one—one that will stand hard knocks—one that won't warp—one that will last till he's through with benches and then be good for the other boys. In short, he wants a Grand Rapids bench. Write today for free and complete catalog showing our many styles.

## Grand Rapids Hand Screw Co.

Largest Manufacturers of Home Benches in the World

920 Jefferson Avenue, GRAND RAPIDS, MICH.



**\$5.00** for this beautiful **Tool Case**

Style No. 5. Portable Tool Case, built for service and designed for Tool Makers and Machinists. Finished in beautiful golden oak with varnish that will not show mars or scratches, shellac lined drawers, brass lock and fittings, durable soft leather handle, steel pivot hinged sliding lid. Shipment made direct from factory. Money returned promptly if not satisfactory in every particular. Information regarding other sizes and styles on request.

**THE PILLIOD LUMBER CO.**  
SWANTON, OHIO



**Tool Cases** "FOR THE MAN WHO CARES." Style No. 31. A Portable Tool Case for toolmakers and machinists. It is the best that can be built, and appeals to the up-to-date mechanic who desires a tool case that is high grade in workmanship, material and design. We ship direct from the factory, and refund your money if not satisfied. For further information ask for circular No. 31.

*H. Gerstner & Sons*

Manufacturers of Mechanics' High Grade Tool Cases  
818 Germantown Street, DAYTON, OHIO

## WE SHIP ON APPROVAL



Our Hand Power Angle Benders are so indispensable for bending rods, squares, and flat pieces into all sorts of angles that we do not hesitate to ship tools for 10 days free trial. Made in 3 sizes to cover a wide range of work. We also make hand power tools for bending eyes, hooks, "U" shapes, hinges, rings, etc. Write for complete descriptive catalogue.

**WALLACE SUPPLY CO., 31 So. Jefferson Street, CHICAGO**

# Greatest of All Scissors

18 Tools Combined. Only \$1.00

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|--------------------------|---|-------------------------|
| 6. Ruler.                |  | Hammer. 12.             |
| 1. Scissors.             |   | Penknife. 13.           |
| 7. Measure.              |   | Glass Cutter. 14.       |
| 8. Nail File.            |   | Glass Breaker. 15.      |
| 9. Screw Driver.         |   | Marking Wheel. 16.      |
| 2. Button Hole Scissors. |   | Cartridge Extractor 11. |
| 3. Gaspipe Tong.         |   | Cigar Box Opener. 10.   |
| 4. Cigar Cutter          |   | Ink Eraser 17.          |
| 5. Wire Cutter.          |   | Stereoscope. 18.        |

Save yourself a thousand inconveniences in the home, in the office, in the camp, in travel—

ing or anywhere. Carry a pair of our 18-tools-in-1 Scissors. Put up in elegant leather metal-tip sheath. Money refunded if not pleased.

**Wm. C. Hocking & Co. 464 Marine Bldg. Chicago**

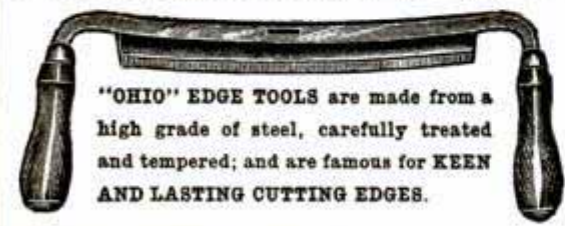
The trip to Salt Lake City was made in 14 days. Some bad roads were encountered, the worst of these being in Iowa, which the tourists entered during a week of rain, and Wyoming, where deep ruts and their accompanying highroad centers proved a nuisance. An accurate record was kept of the mileage, and it was found that they averaged 191.6 miles a day, ran 9.5 miles to the gallon of gasoline and 277 miles on every gallon of oil.

## Wonderful "Awl for All"

This little tool is a marvel. Regular hand sewing machine. Will mend anything from thin fabrics up to heavy shoe and harness leathers. Worth its weight in gold. Easily carried in the pocket ready for any emergency. **Only \$1** postpaid. Special terms to agents. Big money maker. Write today for territory. Book 45 free. **C. A. Myers Co., 6537 Woodlawn Ave., Chicago**



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"OHIO" EDGE TOOLS are made from a high grade of steel, carefully treated and tempered; and are famous for KEEN AND LASTING CUTTING EDGES.



Under our "Ohio" trade-mark, which is a guarantee of highest quality, we manufacture a full line of

**Planes (both Iron and Wood), Chisels, Drawing Knives, Gouges, Auger Bits, Spoke Shaves, Bench and Hand Screws, Cabinet Makers' and Manual Training Benches, etc.**

Insist on "Ohio" Tools when buying anything in these lines. They are carefully made from best materials, skillfully treated and tempered, and well worth insisting upon.



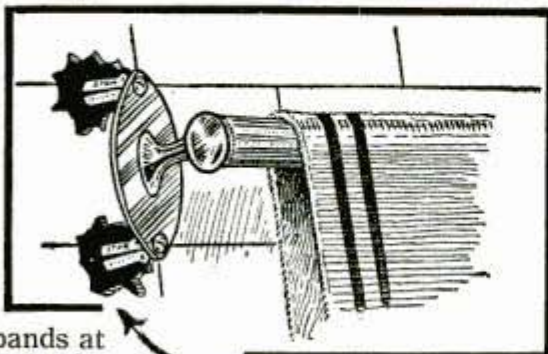
**OHIO TOOL COMPANY, Dept. No. 3, Columbus, Ohio**

Registered

## Use STAR Screw Anchors If You Want to Hold Things Fast

Holding a towel rack is one of the many ways Star Screw Anchors can be used.

We guarantee them to hold in any kind of a wall, such as Brick, Tile, Marble, Concrete or Wood boards.



Expands at inner end.

Drill a hole; insert anchor; run a screw through article on into anchor and tighten. Send for Free Samples and directions to use *today*.

A small gimlet will drill a hole large enough for anchor. "We will furnish a special drill."

**Star Expansion Bolt Co.**  
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# FOR XMAS PRESENTS

Nothing can be more acceptable than handy, useful tools of handsome design and finish.

## Goodell-Pratt Tools

with their superior workmanship and attractive lasting finish will be appreciated by any man who works with or amuses himself with tools.

## Our Catalog



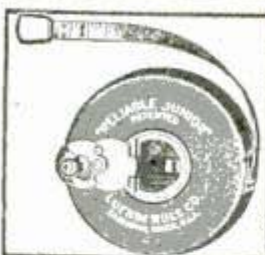
will be sent free. Perhaps you will see in it just what you will want to give; perhaps you will see something you want yourself.

**Goodell-Pratt Company**

*Toolsmiths*

**Greenfield, Massachusetts, U. S. A.**

**WHAT BURNS WEEKLY.**—In the United States the weekly average of buildings burned is about as follows: Three theatres, three public halls, 12 churches, ten schools, two hospitals, two asylums, two colleges, six apartment houses, 26 hotels, three department stores, two jails, 140 buildings and about 1,600 homes. The greater number of these fires are due to carelessness and poor construction. —Fireman's Herald.



**LUFKIN**  
**TAPES AND RULES**  
ARE THE BEST  
FOR SALE EVERYWHERE SEND FOR CATALOG No. 26  
**THE LUFKIN RULE CO.**  
SAGINAW, MICH., U.S.A.  
NEW YORK, LONDON, ENG., AND WINDSOR, CANADA

## Our Little Drill Press No. 23



will be found an exceedingly useful and convenient tool for light work. The frame is made of steel and iron japanned. The feed is supplied by a compound lever, which is convenient, sensitive and effective. The chuck holds drills from 0 to  $\frac{3}{8}$  of an inch. The distance from chuck to table with sliding frame at highest point is  $6\frac{1}{2}$  inches. Weight  $8\frac{1}{2}$  pounds. Price each \$3.50.

ASK FOR CATALOGUE

**MILLERS FALLS CO., 28 Warren St., NEW YORK, N.Y.**

# Sensible Christmas Gifts for MEN

## "YANKEE" TOOLS

### Pocket Screw Driver—No. 60



Steel—Nickel-plated and polished—very attractive. Four blades, carried in handle—Fits the hand—Fits the pocket—Fits the screws—Fits the purse.

65c postpaid

An Acceptable Little Gift—Fit for any Man

"YANKEE" TOOLS make sensible and very acceptable gifts for all men who ever have occasion to use tools of any kind. They last for years and the giver is remembered whenever they are used. Send for book of new ideas in time-and-labor-saving tools, full of interesting suggestions for Christmas.

A postal brings it if you mention "Popular Mechanics."

Ask your dealer for "YANKEE" TOOLS

**NORTH BROS. MFG. CO., Sta. Q., PHILADELPHIA, PA.**

## 18 TOOLS FOR \$1.15

A combination calliper gauge and rule in vest pocket size. Will take the place of 18 bulky tools. Indispensable to the mechanical trades, automobilists, draftsmen, etc. Handsomely made and finished of best grade steel and absolutely accurate. At all leading hardware stores or sent direct by the manufacturers. **C A T A-LOG FREE.** In leatherette case, \$1.15 prepaid.



**CHICAGO STEEL & BRASS WORKS**  
324 W. Washington St., Chicago, Ill.

**OBJECTED TO THE COFFIN MAKER.**—The members of a family in Scotland were watching round the death-bed of the father.

At last he lay perfectly still.

The mother burst into tears, exclaiming:

"He's gone at last, and I'll never be happy till I follow him!"

Then, in a business-like tone, she added:

"We'll better have the funeral on Wednesday, and we'll jist get Willie Paterson to mak' the coffin. Though he hasna been a friend of oors, yet—"

But here they were startled by a voice from the bed moaning forth:

"If you get that craytur Willie Paterson to mak' the coffin I'll no put a foot in't."—Western Undertaker.

## GENUINE KLEIN PLIERS

312 5 in. \$1.00; postage 6c. 312A 6 in. \$1.25; postage 7c. 312B 7 in. \$1.50; postage 10c. 312C 8 in. \$1.80; postage 18c. 312D 9 in. \$1.80; postage 18c. 312E 10 in. \$2.25; postage 27c. Until the supply is exhausted, we will give a copy of the 25c book "Telephone Troubles and How To Find Them" with every order for KLEIN PLIERS. Order early before they are all gone.

MATHIAS KLEIN & SONS, Manufacturers, Station U 35, CHICAGO



## The "Baby" Torch

Invaluable for Home, Workshop and Repair Kit

\$1.25

Prepaid

Produces intensely hot flame for soldering, welding, removing paint and 101 odd jobs around the home, repair shop, automobile, motorboat, etc. Powerful, compact, purely automatic, absolutely safe, works without air pressure, lights with match, burns two hours with one filling. Has no objectionable features of other torches. Size of tank, 3x2 in. Used and recommended by Householders, Autoists, Electricians, Jewelers, Dentists and Repair Shops everywhere. Price \$1.25 prepaid. Money back if not satisfactory.

CRESCENT CO., Valparaiso, Indiana



## Gasoline Soldering Iron Blow Torch



No Smoke, Ashes or Sparks. Greatest Time and Fuel Saver. Our Booklet on Request.

**EMMELMANN BROS. MFG. CO.**  
INDIANAPOLIS, IND., U. S. A.

**\$18 to \$30 a Week Sure**

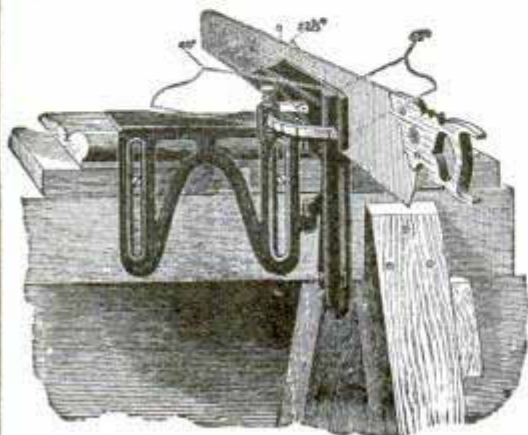
Farmers "Ever Ready" Tool Kit does it



Agents going wild over results. M. Snyder made \$46 in 2 hours. Joseph Pine took 65 orders in 2 days. M. D. Finch sold 42 in 9 hours. Had no experience. You can do it. To show it means a sale, FREE SAMPLE to workers.

**FOOTE MANUFACTURING CO., Dept. 260, Dayton, O.**

**WHEN YOU WANT ANYTHING AND DON'T KNOW WHERE TO FIND IT WRITE BUREAU OF INFORMATION, POPULAR MECHANICS CHICAGO**



## "Seavey" Mitre Box Meets Every Requirement

Cuts any angle—special or regular. Needs no special saw. Lightest box made. Can be instantly applied. Made so that it is attachable to inside or outside work without a special attachment.

With this ad. for 30 days, postpaid, \$2 each

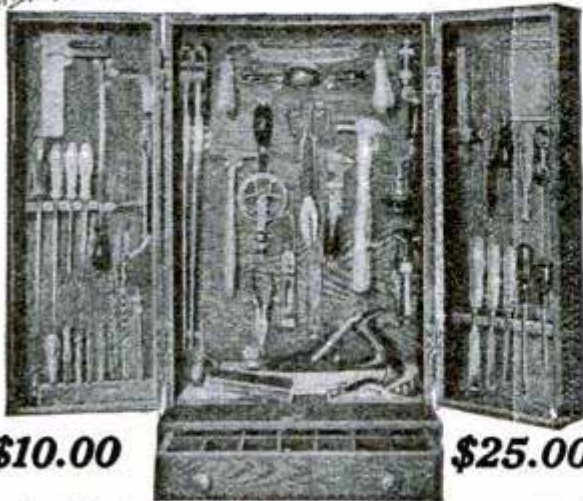
**Smith & Hemenway Co.**

108-110 Duane St., NEW YORK, U.S.A.



# The Best Christmas Gift

## FOR FATHER OR SON



**\$10.00**

**\$25.00**

tools will be forwarded you at once, *charges prepaid*. Don't delay if you want one.

**Other Christmas Gifts**—In our large 700-page catalog, illustrated herewith, are listed over 75,000 reliable articles. The catalog contains everything you could possibly think of, and you will save money by buying from it. It will be sent free of charge, postage paid.

We guarantee every article we handle. Unless you are perfectly satisfied return it and your money will be refunded. We have been in business since 1816, and the publishers of this paper will testify to our absolute responsibility.

*Note: The Tool Cabinet will be sold to anyone, but our large catalog will not be forwarded to towns of over 50,000 population.*

**White, Van Glahn & Co.** 30 BARCLAY ST., NEW YORK  
Oldest Mail Order House in America.

### A Complete Tool Cabinet

HERE is a sample of how we can save you money on Christmas gifts. A complete Tool Cabinet, similar to illustration, delivered to you, *freight prepaid*.

The \$10.00 Cabinet has 24 standard size carpenter's tools of best quality. The \$25.00 Cabinet has a much larger assortment as illustrated. *An unequalled bargain.*

These Cabinets make the finest possible gifts. The tools are not toys or trash. Everyone is *high grade, well finished, and guaranteed*. Money back if not satisfactory.

Every tool is in plain sight. You cannot lose or mislay them. The case is quartered oak and strongly made. The tools will last for years.

Cabinets like these would cost at least 40 per cent. more in your local stores. The reason is that we offer you *New York wholesale prices*. Write to-day for Special Tool Catalog. It describes these goods in full. Or send \$10.00 or \$25.00 check or money order, and the cabinet with



Our large 700-page Catalog, illustrated herewith, contains over 75,000 reliable articles.

All offered at *New York wholesale prices*. Send for it to-day.

Established 1816



## The New Carborundum Sharpening Stone for Carpenters

It's a combination stone AND IT IS ROUND

Its shape and size allow for the rotary motion required in sharpening chisels, planer iron, etc. With the ordinary rectangular stone a square inch or two is used and the rest scarcely ever touched—

With the round stone all of the cutting surface—twelve inches—enough for the largest tools—is brought into play and there is no unused surface.

Besides, it has the fast, keen edge producing Carborundum qualities.

**PRICE ONE DOLLAR**

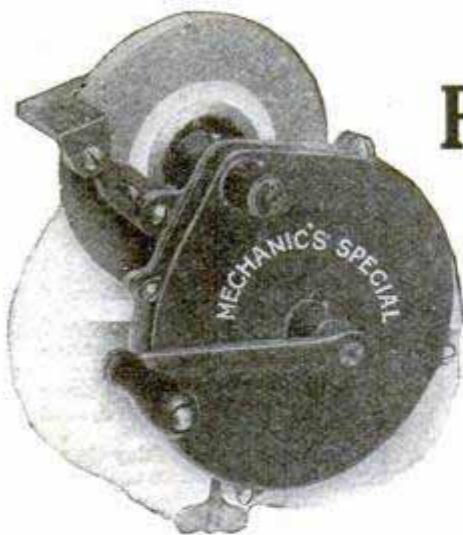
**QUARTERED OAK BOX HOLDER FIFTY CENTS**

Ask your dealer, or send direct to

**THE CARBORUNDUM COMPANY**

NIAGARA FALLS, N. Y.

## Mechanics' Special Tool Sharpener



Sent on  
**FREE**  
**Trial**

Write today for  
our Free Catalog

**NEVER GETS  
OUT OF ORDER**

**WILL LAST  
A LIFETIME**

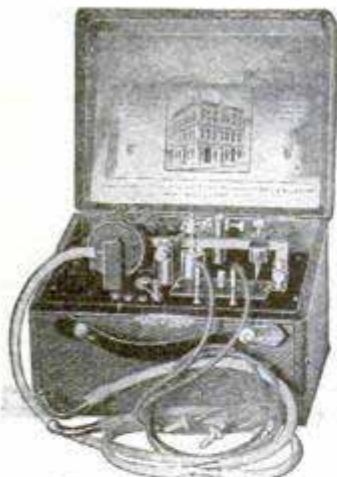
A tool grinder built the same as a high class lathe. A machine that should be a part of every mechanic's tool chest. In efficiency equal to a power driven grinder. All gearing cut from solid blank and encased and absolutely dust proof. Bearings run continually in oil, insuring long life to the machine. Has bronze bearings. Has adjustable tool rests permitting the correct sharpening of plane, bits, chisels, etc. Carborundum non-heating grinding wheel used. Size, 7x1 inch. It can be instantly clamped to any bench or table and as instantly put out of the way when through using. Shipped **ANY PLACE** for a free trial—no money down—returnable at our expense if you don't want to keep it.

Write today for prices and catalog of the most complete line of grinding machines made.

**LUTHER BROS. COMPANY**

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## YOUR HEARING PERFECTED



Electro-Vibratory Apparatus

The only machine of its kind ever invented; fully protected by U. S. Patent No. 741,371. Infringers will be prosecuted. Hundreds sold in this and foreign countries. Manufactured and sold only by G. C. Powell (Patentee).

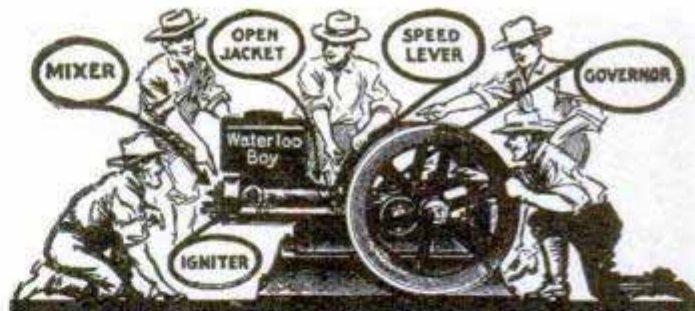
functions. You can then hear perfectly.

If medical science has failed in your case; if the various ear drums and other devices claimed to restore lost hearing have failed to give you desired results, and you are willing to test the most successful method in the world for perfecting your hearing, just write today for full particulars, and learn how you may improve your hearing right in your own home free of charge. Address

G. C. POWELL, 5545 Bank Bldg., PEORIA, ILL.

By the simplest, easiest, most practical and rational method ever discovered—**ELECTRO VIBRATION**. Not a new theory—not an experiment, but a proven, practical, everyday fact.

Deafness is not a disease as you may suppose, but is the result of certain causes, the removal of which is easily accomplished with the aid of the Powell Electro-Vibratory Machine, one of the most remarkable inventions of recent years. The magnetic wave current produced by this wonderful machine acts as a gentle massage on the delicate organs of the inner ear, stimulating them to renewed activity, thereby causing them to perform their natural



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5 YEAR  
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## The Waterloo Boy

has all of the good points that go into any gasoline engine besides many exclusive patented features. A few days' trial will enable you to point out the superior points that make the

## Waterloo Boy

the best engine for every conceivable purpose.

We will send to any responsible person a Waterloo Boy on 30 days' free trial, and if it does not do all and more than we claim, if you are not satisfied that it is the best, send it back and we will pay the freight both ways. Can you think of a more liberal proposition than this? Write today for our free catalogue, showing styles and sizes and our free trial offer blank.

## Waterloo Gasoline Engine Co.

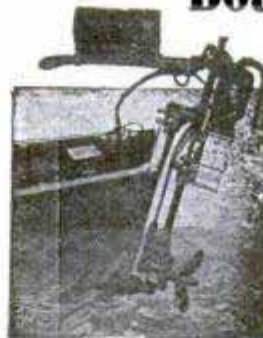
YEARLY  
CAPACITY  
15000 ENGINES

1021 W. 3rd Ave., WATERLOO, IOWA

30  
DAYS  
FREE  
TRIAL!

**WHY FOAM IS WHITE.**—Beer is brown, but its foam is white. Shake up black ink and you get white foam. Shake up red ink and the result is the same. A body that reflects all the light it receives, without absorbing any, is always white. All bodies powdered into tiny diamond form, so that they throw back the light from many facets, absorb none of it and are white by consequence. Powdered black marble, for instance, is white. And foam is water powdered into these small diamonds, and hence its whiteness.—New York Press.

## Make a Motor Boat of Any Boat in Five Minutes



You can do it with the Waterman Outboard Motor, which you can quickly attach (and detach) to the stern of any skiff, row boat, dinghy, punt, sail boat, and have a good motor boat. It is not a toy, but a reliable 2 H. P. Marine Motor that will drive an 18-foot row boat 7 miles an hour, 4 hours on gallon gasoline. Simplest motor made. Weight 40 lbs. Equipped with **Schebler Carburetor**. Four years' successful results behind it. Send for **Catalog C. Canoe Motors, 1, 2, 3, 4 Cylinders—Catalog K. Standard Type Motors, 1 to 30 H. P.—atal og A.**

**WATERMAN MARINE MOTOR CO.**

1507 Fort Street, West, DETROIT, MICH., U. S. A.

2 to 25 hp.  
1 to 4  
of  
**PERFECTION ENGINES** \$29 to \$450  
Marine and  
Stationary

## Our New 7-8 H. P. Duty

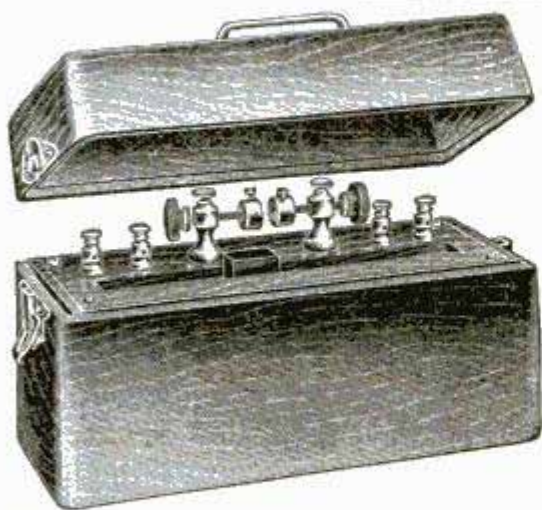
is pulling buyers from every section of the U. S. Anyone who wants an engine for commercial purposes must concede it is the best buy of the year. We can prove it to you if you will send for the literature. Develops 8 horse power at 500 R. P. M.—is built strictly for service—and backed by the strongest guarantee ever put behind an engine. Write at once for particulars and prices.

**CAILLE PERFECTION MOTOR CO.**

1311 Second Avenue, Detroit, Mich.



## Wireless Telegraph Apparatus



We manufacture a complete line of Wireless Transmitting and Receiving Apparatus for long and short distance work. Wireless pamphlet mailed on application.

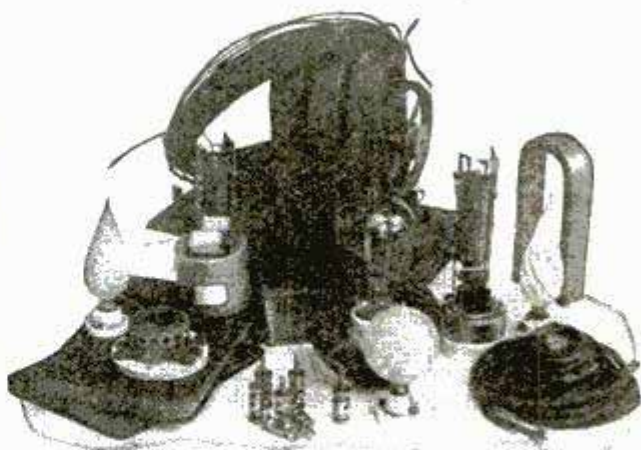
We also have *something electrical for everybody*, described and illustrated in catalogue 24P. 200 pages. Ask for it.

**Manhattan Electrical Supply Co.**

17 Park Place, NEW YORK

188 Fifth Ave., CHICAGO

## THIS COMPLETE FOR Electrical Outfit \$5.00



This big offer for short time only. New type Acme Multipolar 100 Watt Generator. New and in original boxes. Nickel finish, bronze bearings, oil cups, brass running gearing—weight of Generator alone  $6\frac{1}{2}$  pounds. We have only 2950 in this lot and reach over half million readers through different magazines. **Act Quick.** The balance of the outfit consists of 4 pair Electro Magnets, 20, 40, 70 and 200 ohms— $\frac{1}{4}$  W. Wire—1 Bell—6 Brass Binding Posts—1 Permanent Magnet— $1\frac{1}{4}$  Solenoid Magnet—2 Miniature Lamps & Sockets—One Test Lamp & Socket—1 Switch—1 Push Button.

**FREE:** Send in this ad with your remittance of \$5.00 and the name and address of five of your friends and we will send you free in addition to the big outfit a 200 ohm polarized relay (weight  $1\frac{1}{4}$  W.), also a \$2.00 pair of electro-magnets, 30 ohms, originally made for dating stamps and electric clocks.

**WESTERN ELECTRIC SALVAGE COMPANY**

New No. 1222 So. Washtenaw Ave., Chicago, Ill.



## THE CENTER FIRE SPARK PLUG

The Plug of Clean Combustion. Increases power 10 per cent. The Racing Machine Plug. Right in center of combustion, allowing explosion to travel in all directions at same time. Plug is always kept clean by in rushing fresh charge.

Samples at \$1.00 each for limited time.

GENERAL ACCUMULATOR AND BATTERY CO., 124 Second St., MILWAUKEE, WIS.

**A CORRECT SENSE OF TASTE.**—An old negro was asleep on the train out of Sedalia the other day, mouth open and snoring, when a commercial traveler emptied a quinine capsule on his tongue. The old darkey awakened, began to spit around and called for the conductor, saying:

"Boss, is there a doctor on this here train?"

"I don't know," said the conductor. "Are you sick?"

"Yes, sir, I sho' is sick, I sho' is sick, I sho' is sick."

"What is the matter with you?"

"I dunno, sir, but it taste like I busted my gall."

## ELECTRIC

**GOODS FOR CHRISTMAS.** World's headquarters for Dynamos, Motors, Fans, Toys, Batteries, Belts, Bells, Pocket Lamps, Toy Railways, Books, Xmas Tree Lights, etc. We undersell All. Fortune for Agents. If it's electric we have it. Big Catalogue, 3 cents

**OHIO ELECTRIC WORKS, CLEVELAND, OHIO**

## ELECTRICITY

(VOLTAMP)

The most wonderful and fascinating scientific study of the age. Every Boy, Girl and Grown-up should know about it. The new "Voltamp Electrical Products" — Our 112

Page Catalog now ready, the most complete and interesting book ever issued — is full of illustrations and descriptions of the latest Voltamp Electrical Novelties — Motors, Dynamos, Toys, Machine Models, Telegraph and "Wireless" Instruments, Ruhmkorff Coils, Spark Coils, Geissler Tubes, Switches, Meters, Lamps, Flashlights, Transformers, Tools, etc. The greatest line of Miniature Electric Railways ever shown. Anything Electrical for Anybody. Ideal Christmas Gifts. Prices consistently low.

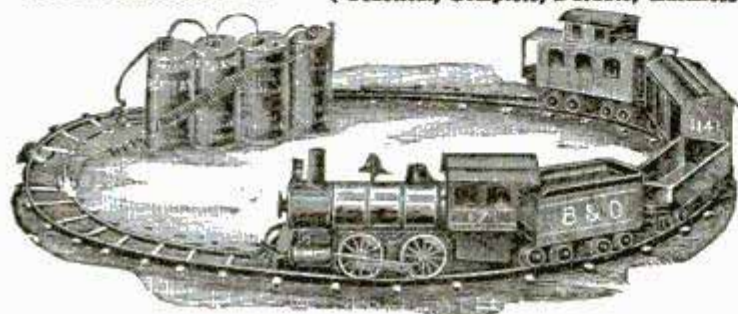
Send for this Catalog — 6 cents in stamps or coin (no postals answered) which will be refunded on first order of 50 cents or over.



**VOLTAMP ELECTRIC MANUFACTURING CO., Voltamp Block, BALTIMORE, MD.**

# ELECTRICAL TOYS FOR BOYS

**SOME CHRISTMAS SUGGESTIONS** } Scientific ELECTRICAL Novelties  
} Practical, Complete, Durable, Harmless



**EVERY** boy in the country can easily own a railroad. Costs little and pays big dividends in fun. Our Models of Locomotives, Trains, Trolley Cars, Dynamos, Lamps, etc., are practical and durable inventions. Equipped with dry batteries, no acids or liquids used, perfectly safe and harmless. Electrical toys instruct as well as amuse.

Catalog B, fully illustrated, quoting low prices—SENT FREE.

**THE CARLISLE & FINCH CO.**

262 E. Clifton Ave., Cincinnati, Ohio

Largest Manufacturers Electrical Novelties in the World.

# THE SENSATION OF THE SEASON



Pocket Ammeters and Voltmeters with Indestructible Metal Dials more accurate than other makes with hand drawn scales. Permanent magnet type, indicates polarity as well as current. Guaranteed for one year.

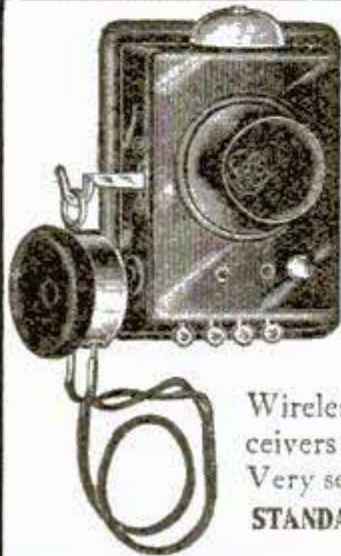
**A Superior Meter at the Price of a Poor One**

Look for This Design   
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**CORNELL UNIVERSITY TEST ROADS.**—Cornell university is to conduct experiments with different kinds of road material. The department of grounds of the university has already completed a stretch about 4,000 ft. in length, divided into 11 sections. Each section is of different material, or the same material used in different forms.

**CRIMINALS AT LARGE.**—Gibbs (visiting): "What sort of neighbors have you here?"

Dibbs: "A bad lot. There's a blacksmith who's engaged in forging, a carpenter who's done some counter-fitting, and a couple of fellows next door who sell brass and steel for a living."—Boston Transcript.

Pat was brought before the magistrate charged with assault and battery. His honor called his case and inquired of Pat whether he was guilty or not guilty.

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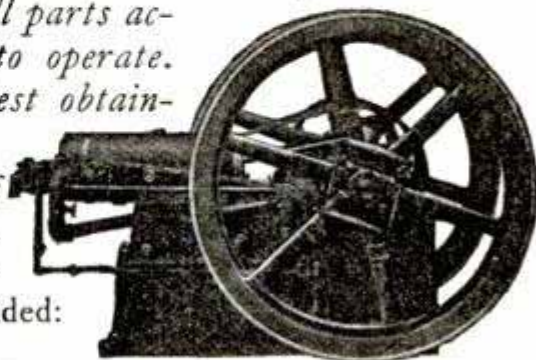
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**TOO REALISTIC.**—Cinematograph performances are to be given at the Kokugikwan Ryogoku, from Wednesday and a "rehearsal" of one of the pieces, showing the great Saigo and priest Gessho in a boat on the bay of Kagoshima, was held at Oiso the other day for the purpose of preparing the film. It is to be remembered that Saigo and Gessho jumped into the water from the boat to drown themselves, but Saigo was saved by fishermen, while Gessho was drowned as he could not swim at all. At the rehearsal a boat was fitted and two men went to sea in it. Some distance out the two jumped into the

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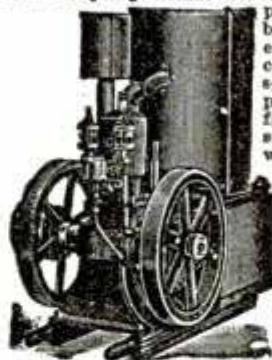


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perfectly. Runs on gasoline, too, better than any other. Basic patent. Only 3 moving parts. Comes complete ready to run. We will send a "DETROIT" on free trial to prove all claims. Runs all kinds of farm machinery, pumps, saw rigs, separators, churns, feed grinders, washing machines, Silo fillers and electric lights. Money back and freight paid both ways if it does not meet every claim that we have made for it. Don't buy till you get our free catalog. 2 to 24 h. p. in stock. Prices \$29.50 up. Special demonstrator agency price on first outfit sold in each community. 2000 satisfied users. We have a stack of testimonials. Write quick. (20)

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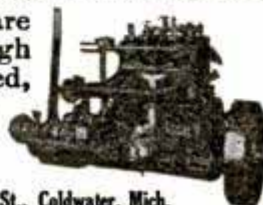
Detroit Engine Works, 213 Bellevue Ave., Detroit, Mich.

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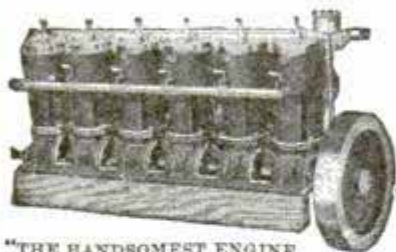
Regal Gasoline Engines are built for heavy service and high speed, and, as guaranteed, everywhere and at all times give absolute satisfaction.

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The Elbridge Engine has overcome this one fault. Its proven fuel consumption is only 2-3 of a pint per h.p. hour. No other engine on earth uses so little gasoline.

And this fuel consumption does not vary, no matter how high the speed. The Elbridge has a speed range, without waste of gas, of from 200 to 2,000 r.p.m. This is accomplished by De Long's exhaust ports—4 ports, low in the cylinder, instead of the old-time single high port.

This is the lightest engine for its power ever built. That is a definite, clean-cut statement which we can easily prove if you'll let us.

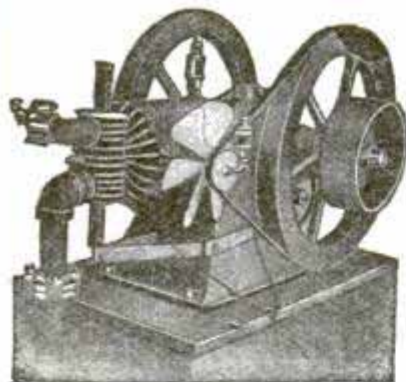
The Elbridge was the first engine to lubricate through the gasoline tank, thus avoiding all exterior oiling devices, gaining in cleanliness and using less oil.

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water, one of them being picked up by fishermen, while the other was left to himself in strict accordance with historic facts. The scene was indeed an excellent one and promised to win applause from the audience when shown on the stage. A serious accident, however, took place in the rehearsal, for the man representing Gessho was neglected so long that he actually got drowned. All the performers were thunder-struck and doctors were sent for. Thanks to the kind efforts taken by the latter, he was at length brought to by artificial respiration.—Tokio, Japan Times.



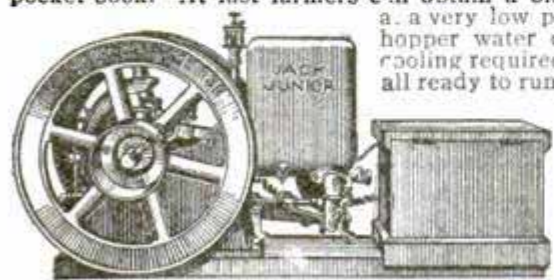
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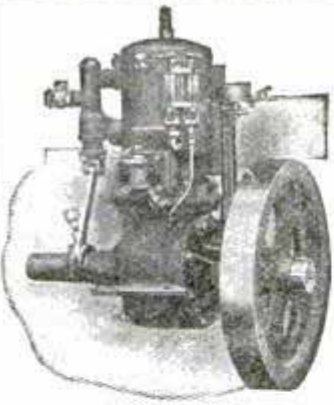
Don't confuse this sturdy worker with toy air cooled engines made merely to sell.

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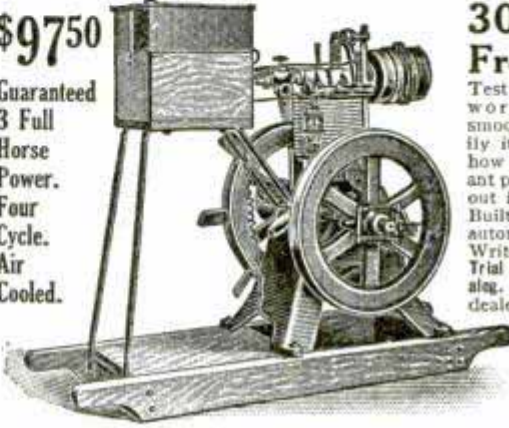
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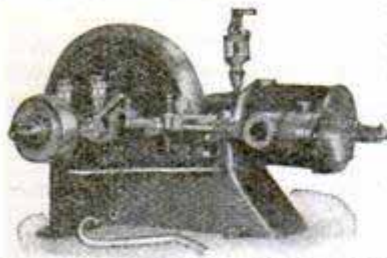
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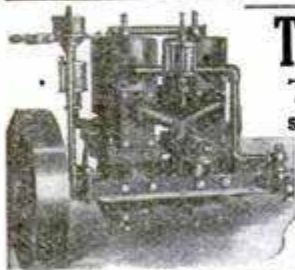
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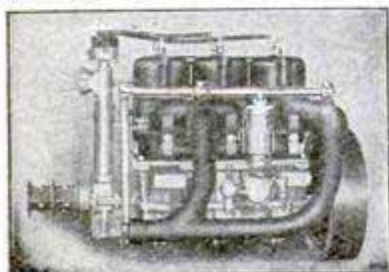
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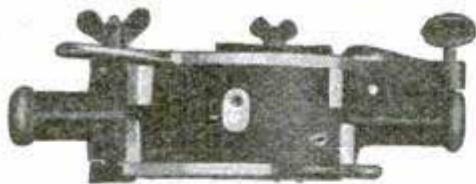
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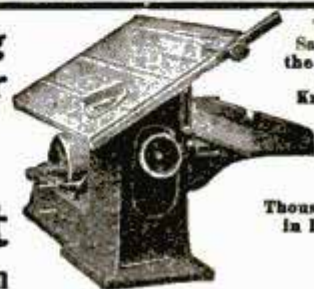
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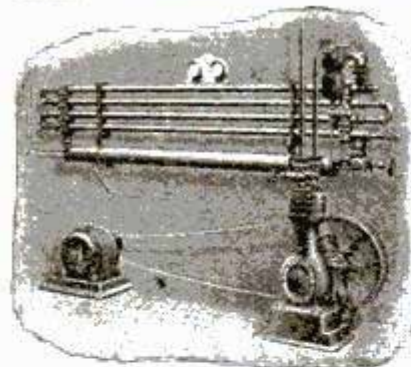
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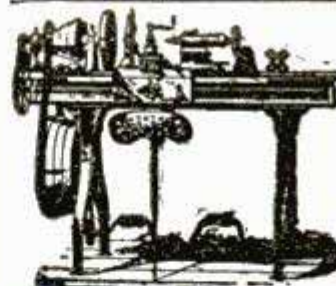


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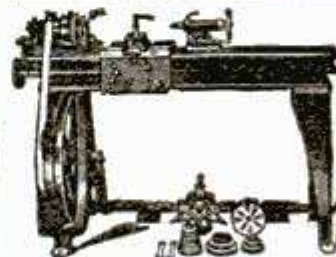
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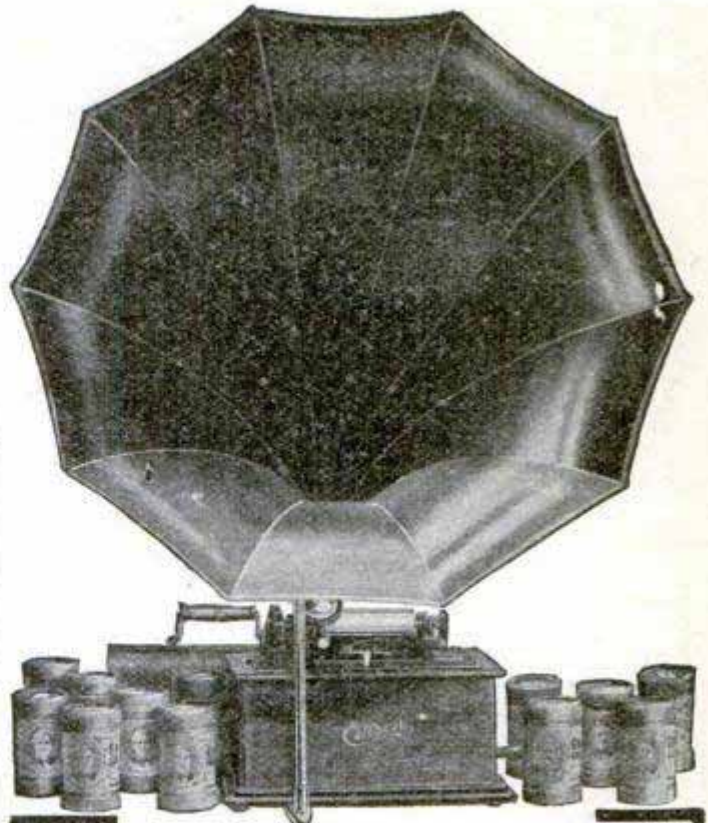


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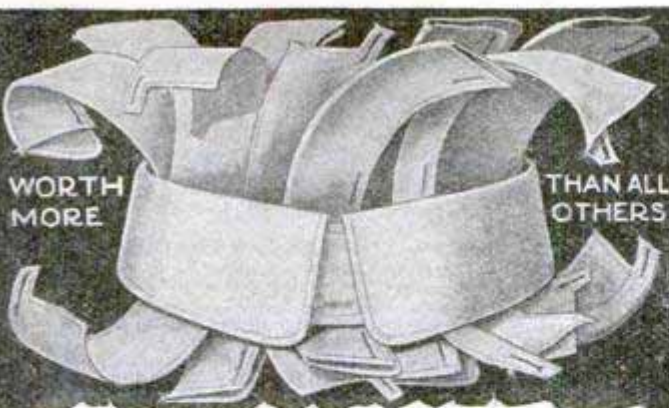
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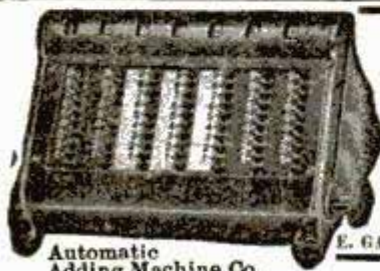
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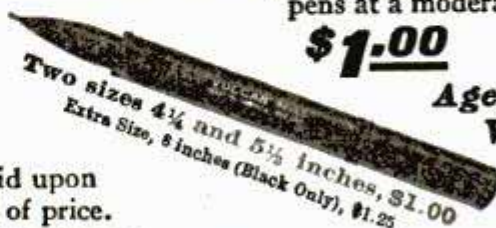
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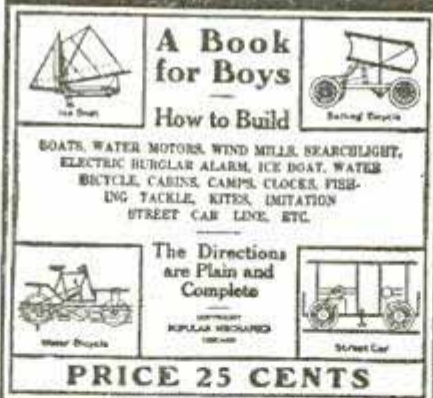
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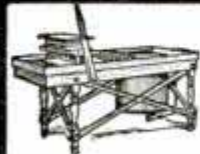
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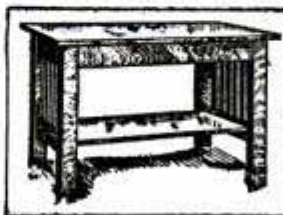
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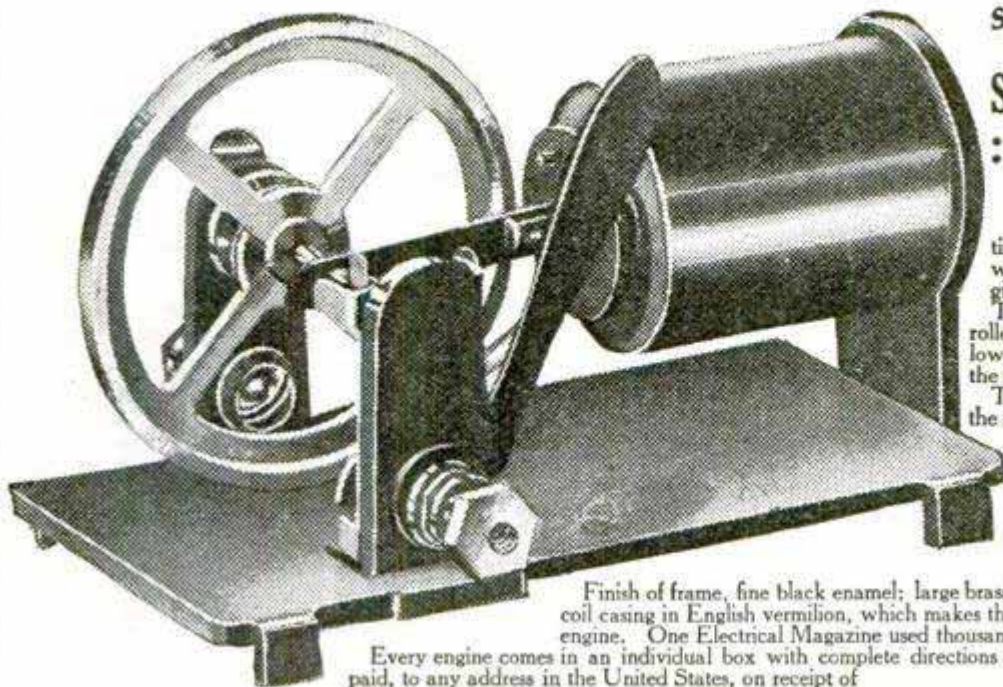
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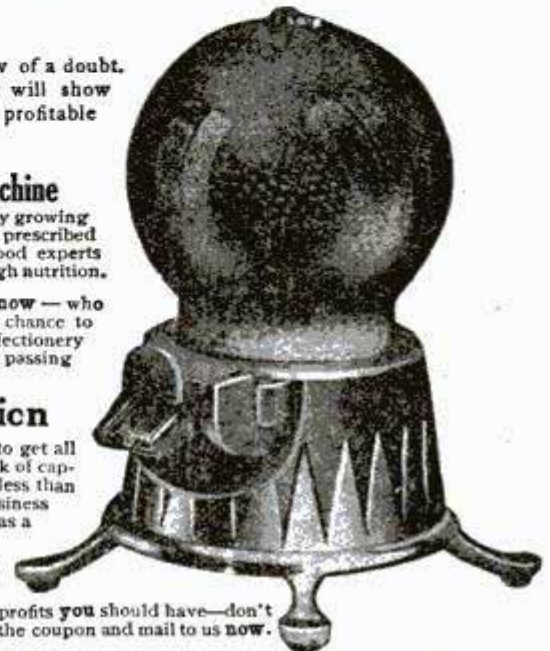


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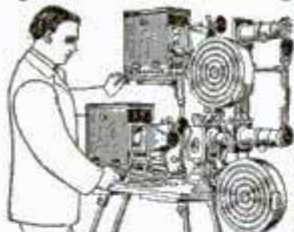
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**THE SO-CALLED "SPANISH SWINDLE."**—The Department of State, at Washington, has received a report from the American Consul-General at Barcelona, Spain, in regard to the band of swindlers operating in various towns and cities in Spain, who make a practice of writing to persons in the United States respecting the imprisonment of a relative and the guardianship of a child.

The Consul-General states that the alleged prisoner generally describes himself as a political prisoner from Cuba; he is at the point of death and has but one friend—the prison priest—through whose good offices he is enabled to smuggle an occasional letter out of the prison fort.

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The prisoner is rich. He has a fortune in cash on deposit in the United States, but the certificate of deposit is concealed in a secret receptacle of his valise; the valise itself has been taken possession of by the court at Carthage, which tried and condemned him, and will be held until the prisoner or his representative has satisfied the costs of the trial. The prisoner has an only daughter; dying in his prison, his sole thought is of this beloved offspring. He has no friend or relative in Spain to whose care he can commit her. In this emergency his thoughts turn to the distant relative in the United States whom he has never seen and of whom he knows only through hearsay or the family tree. Will the distant relative assume the guardianship of the darling daughter, and the darling daughter's fortune of about \$30,000? If the distant relative accepts the trust one-fourth of the prisoner's entire fortune will be the material reward. The good priest will go at once to the United States and take the darling daughter with him. There is but one condition; the ready money which the prisoner brought with him to Spain has been exhausted; the distant relative is therefore requested to send enough to liberate the valise containing the secret receptacle and the certificate of deposit. This money is to be sent

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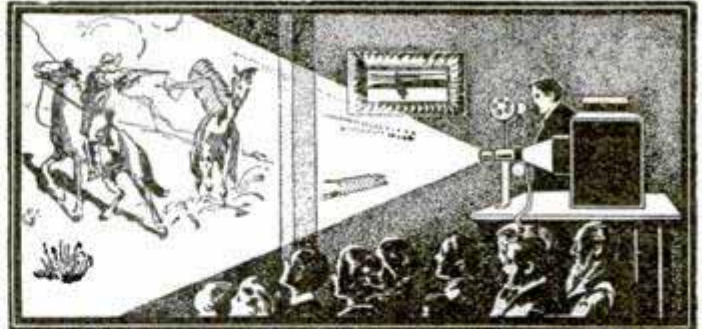
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to the good priest at an address indicated, and, having received it, the good priest will at once secure the valise and start for America, the "land of the free and the home of the brave," with the darling daughter.

The above is generally the first letter of the series. It is quickly followed by another in which the prisoner pathetically states that his strength is rapidly failing and the end is near. He beseeches his dear distant relative to assume the trust and be a loving father to the darling daughter. The third letter is from the good priest himself, who in brief, touching terms, and hopelessly bad English, announces the death of the unhappy prisoner; the good priest adds that the darling daughter is under his care. He is ready to put his promise into execution and start for the United States as soon as he shall have received the necessary funds from the distant relative. The good priest frequently incloses with his letter a bogus newspaper clipping announcing the death in prison at Barcelona of the famous Cuban patriot (sometimes called Augustin Lafiente); the newspaper notice also speaks cunningly of the confiscated valise and the darling daughter.

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Naturally the first impulse of the distant relative is to ask a lawyer or a judge or some authority what course he ought to pursue in the premises, but as he thinks of doing this his attention is taken by the warning in the prisoner's letter beseeching him not to mention the matter to any living soul lest the secret of the valise and the hidden receptacle be indiscreetly betrayed.

The valise, after all, with its concealed certificate of deposit, is the key to the situation and possession must be taken of it before anything can be done or said. This (so cunningly set forth by the prisoner) is very evident to the distant relative, and so he quite fre-

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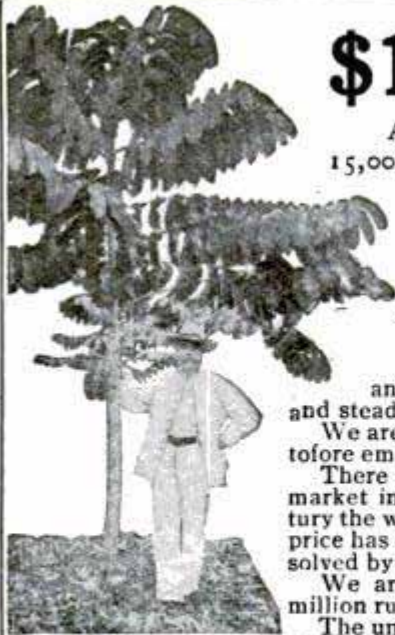
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**CHICAGO WIRELESS SUPPLY CO., Room 52M, Auditorium Office Bldg., CHICAGO, ILL.**

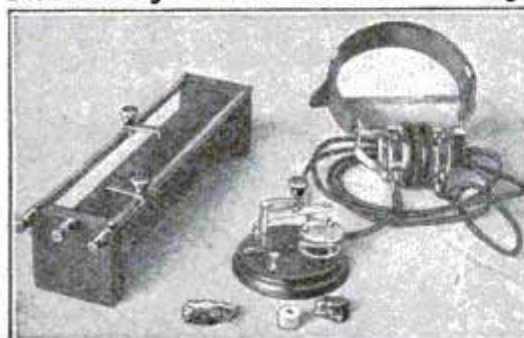


Illustration shows exactly what you get for \$9.00.

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was made by one of our men. Another—a new man—has already made \$7000 since Jan. 1st. Several are making better than \$500 a month—most are making \$200 to \$400 per month.

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federates not only in the United States but in most other countries. The confederates in question select a man and find out all they can about him; they get hold of family names, family origin, and family characteristics. This information is transmitted to the rascals in Spain, and letters are at once written to the prospective victim. The scheme is presented and developed in a very plausible way and many of our fellow-countrymen have "biten" promptly and cheerfully.

Under the Spanish laws a felony must be consummated before the police may act, and a mere attempt to obtain money by false pretenses does not appear to warrant arrest. The money must be actually paid over and the prosecuting witness must be present in propria persona to testify; otherwise prosecution would be useless.

Recently the letters written to the distant relative have varied somewhat from the original; the political prisoner having become a noted Russian banker who absconded, leaving a deficit of some millions of roubles, killed in

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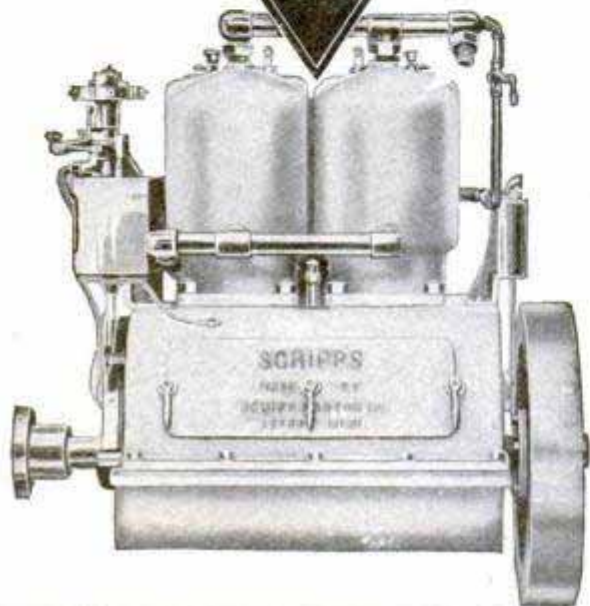
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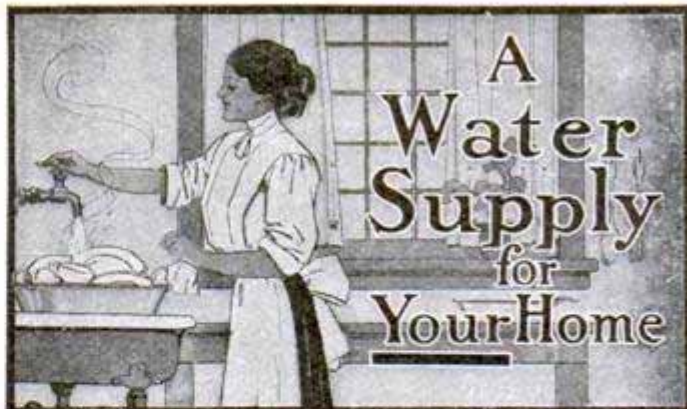
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a quarrel in England another Russian, and finally took refuge in Spain, where he was apprehended and charged with manslaughter.

This change of character, however, is immaterial, and in the future more new characters will probably be introduced by the gang. The scheme is the same, and the public is warned to place no credence in such or similar letters.

Every effort has been made by the Department of State and its representatives in Spain to unmask these scoundrels and bring them to justice, and the Spanish authorities have also been active and several members of the gang have been apprehended and held for trial, but so far no convictions have resulted, owing probably to the peculiarity of the Spanish law referred to in the report of the Consul-General at Barcelona.

Department of State,  
Washington, D. C., October, 1909.





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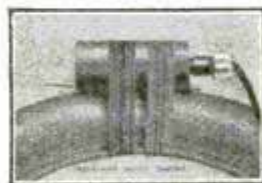
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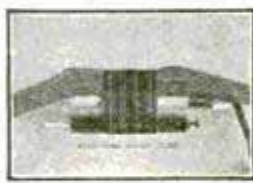
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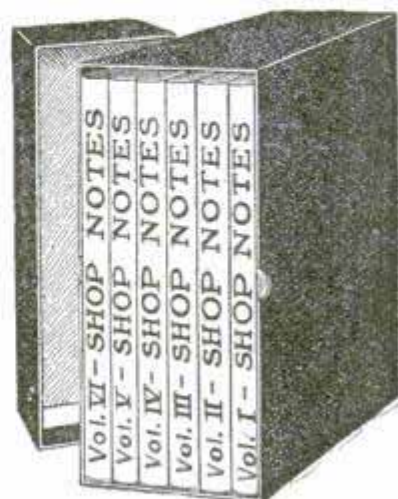
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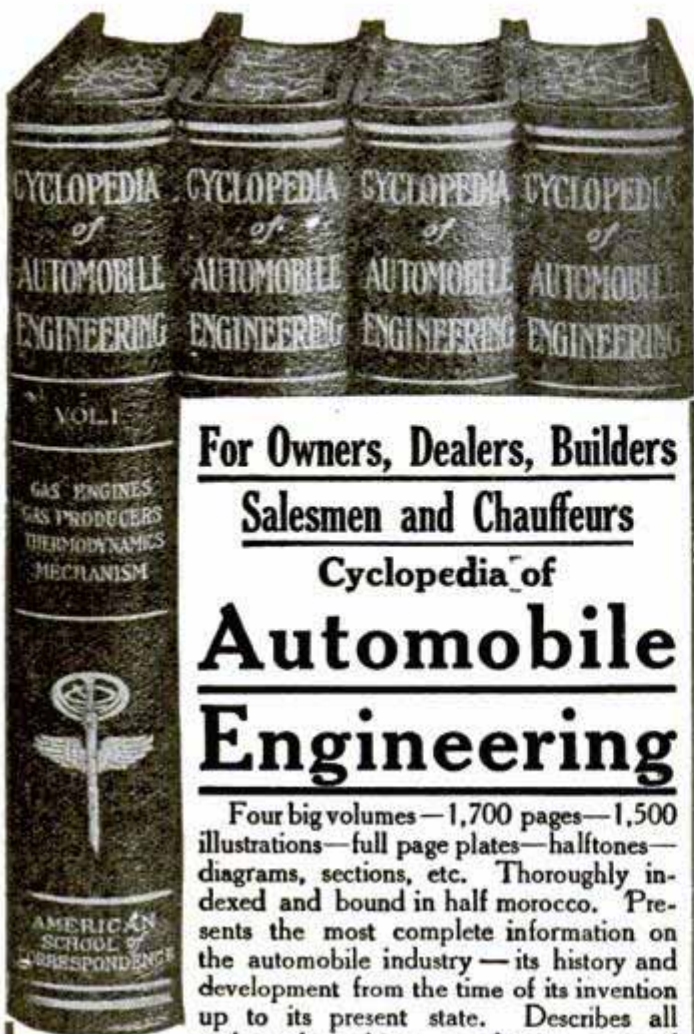


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# MONTHLY CASH PRIZES

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THIS IS IN ADDITION to our usual rates for such contributed articles.

Quality, not length counts.

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### PRIZES AWARDED FOR OCTOBER, 1909

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"How to Make a Concrete Garden Vase."  
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"Marker for a Card Index."

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All accepted contributions to our departments, "SHOP NOTES" and "AMATEUR MECHANIC," are paid for immediately; checks for prize awards are sent at the end of each month.

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