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Dip of the Magnetic Needle.

It is known to those who have devoted attention to the dip of the magnetic needle, in surveying or otherwise, that there is a diurnal variation or disturbance of its action, as was clearly set forth in the letter which appeared on this subject in our columns last week. We find some very interesting information on this point in a letter recently read before the Royal Belgian Academy of Science, by the secretary, M. Quetelet, and received from him by the Swedish philosopher, M. Hansteen. The latter states in his letter that, from observations made in four summer months with a dipping needle and unifilar and bifilar horizontal needles, he has come to the conclusion that the diurnal variation, observable in magnetic phenomena, is produced by a feeble perturbative force which turns around the horizon from east to west in twenty-four hours. "When this force proceeds to the south, the horizontal intensity diminishes, the inclination augments, and the declination has its mean value (about ten hours before mid-day); when it proceeds to the north, the horizontal intensity increases, the inclination diminishes, and the declination assumes its mean value, which takes place about an hour before sunset; when it proceeds towards the west or the east, the respective declination augments or diminishes (one hour after mid-day, eight hours before mid-day or mid-night.)"

The regular inclination or dip of the needle, which is now decreasing, will reach its minimum, Hansteen thinks, in Western Europe in 1878, and it has already reached it in Siberia. It was at its maximum in Europe in 1678, thus indicating a period of two hundred years between the extremes in the dip of the needle. The decrease has proceeded at the rate of 2·316, or about two minutes and a third per annum.

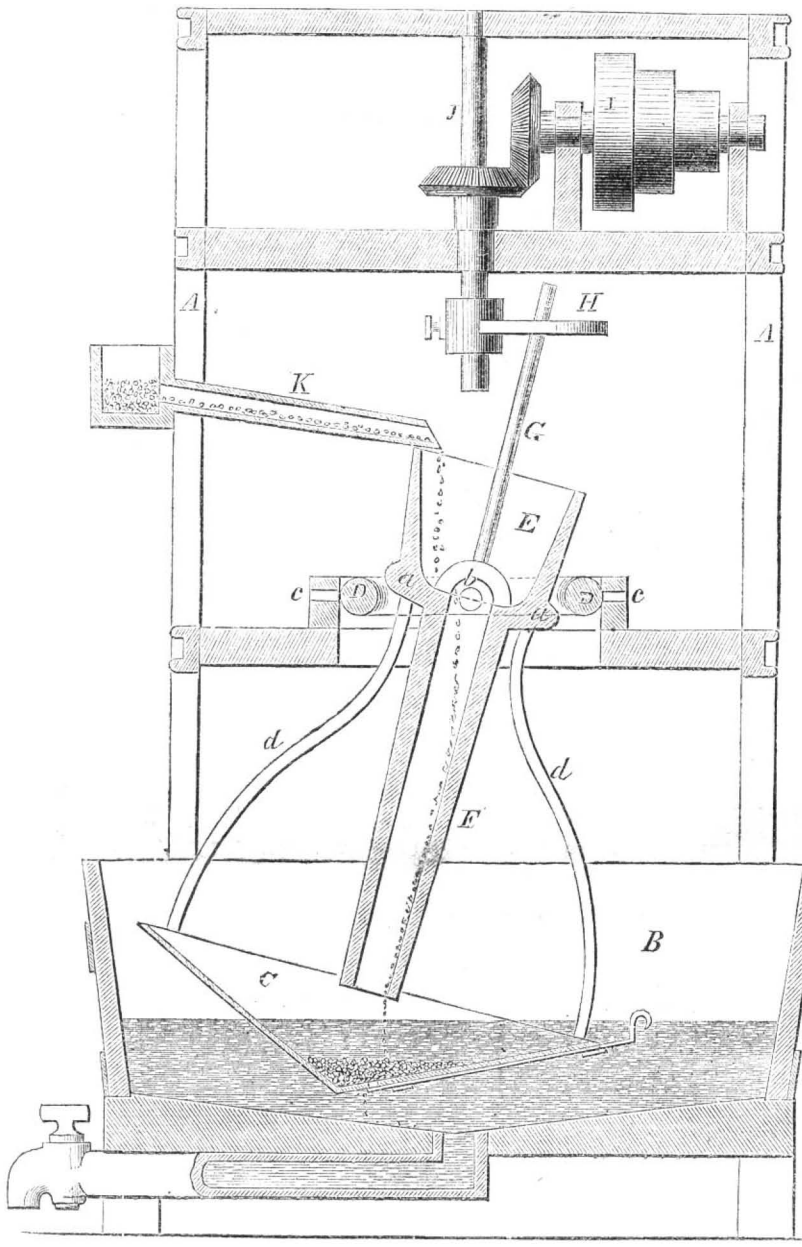
Improved Furnace Bars.

In large steam boilers the furnace bars are generally put in separately, so that those which burn out can be readily removed, and new ones substituted. The removals are usually very frequent, and the supply of new bars forms quite an item of expense in the use of steam power.

The New York *Sun*, speaking of Van Syckel's patent furnace bars, says:—

"In our own experience in keeping up steam night and day, six days in the week, a set of ordinary bars, costing $10 or $15, burns out every six weeks or two months. The improved bars have been in constant use for about five years, and only now require to be changed. Of course, we could not be persuaded to give them up. Engineers and steamship proprietors may profit by our experience, if they like. Van Syckel's patents are now furnished by the Salamander Grate Bar Co., A. D. Melick, President, office, No. 30 Pearl street, New York."

PAULL'S ORE-WASHER.



This improved ore-washer was noticed on page 51, present volume, of the SCIENTIFIC AMERICAN, and we now give an extended description, with an engraving showing a vertical section through the machine.

The invention consists in a peculiar arrangement for giving motion to a suspended basin, to which the ore or mineral is supplied, and which is immersed in water, whereby it is said that the ore or mineral is washed cleaner with a smaller quantity of water, and a larger quantity of it is saved from the rock or dirt, than by any machine at present in use.

A is the framing, in the center of the lower part of which is the tub, B, containing water, and having in it the ore-washing basin, C, partially or wholly immersed. C is suspended by three or more rigid bars, *d*, from a plate, *a*, that is secured to the center of the shaft, G, perpendicular to the basin, and to which the basin is concentric. This plate is provided with two trunnions, *b*, working in bearings in a gimbal ring, D, whose trunnions, *c c*, work in fixed bearings supported in the frame, A. This arrangement of ring and trunnions is equivalent to a universal joint. The plate, *a*, carries a hopper, E, above it, and conducting tube, F, below it, leading from the hopper into the basin, C. The upper part of the shaft, G, passes through a hole in a crank, H, attached to an upright shaft, J, which derives its motion through a pair of bevel gear wheels from the pulley, I. The rotary motion imparted to H gives the other portions rigidly connected with the basin an oscillating movement, and at the same time a revolving motion, for though they do not rotate upon their axes, every point of them moves in a circle.

The ore or mineral properly crushed is fed continuously to the hopper, together with a stream of water by a spout, K, and the tub, B, is kept filled to overflowing. The peculiar movement of the basin causes the ore and dirt with which it is associated to be violently agitated, and to undergo a constant transposition in the basin, and every particle to be brought in contact with the water, so that a most thorough washing is obtained. The ore, by its greater specific gravity, remains in the basin, while the dirt is washed into the tub, from which it is emptied by the pipe and stopcock represented in the engraving.

It is the invention of Joseph Paull, of Eagle River, Mich., and was patented by him October 13, 1857. Further information may be obtained as above.

New Method of Bread Making.

A new system of making *raised* bread—the invention of Dr. Dauglish—is now carried out on a somewhat extensive scale in Carlisle, England. Hitherto all the improvements sought after in breadmaking have related to the *fermentation* of the flour, or else the *raising* of it by effervesence—the gas developed by the decomposition of saleratus,—or some such salt mixed with the dough. By the new method the dough is charged with the raising gas. The flour is placed in a strong iron vessel somewhat similar to a Papin's digester, and moistened with aerated water from an adjacent condenser. Then, for the brief period of eight minutes, the dough is kneaded by machinery inside the vessel. The latter is then opened, and the gas contained in the water with which the flour has been mixed, liberating itself when the pressure is withdrawn, instantaneously expands the flour into five or six times its previous bulk; and the raising of the dough, so tedious and laborious by the old methods, is completed! The process is undeniably a rapid one, but the bread cannot be so sweet and pleasant to the taste as that made by regular fermentation. It is generally held, however, that about 10 per cent of the solid contents of the flour is lost by fermentation, all of which is saved by raising the bread by effervescence or gas.

The Atlantic Telegraph Cable—Its Faulty Construction.

A correspondent—Wm. H. Danforth—writing to us from Salem, Mass., gives it as his opinion that the construction of the Atlantic telegraph cable is faulty, and that it is liable to failure independent of the best paying-out machinery that may be employed. He asserts that as the inside or conducting copper wires of it are small and laid parallel, while the outside protecting iron wires are twisted and laid on the top of a soft material, that when subjected to great strain, the latter wires will attenuate, and reduce the thickness of the cable, thus causing such a tensile strain to be exerted upon the inside small wires as to rupture them, because they cannot elongate in the same proportion as the twisted outside wires.

If such a result should occur, the cable might be laid, and yet fail to operate in conducting messages, because of the inside or conducting wires being ruptured while the outside wires remained intact. Mr. D. asserts that the inside strands should be of sufficient strength to withstand all the strain that may be brought upon the cable. Perhaps it was owing to the drawing out of the inside strands of the cable, during the former attempt to lay it, that the electrical current became *feebler and feebler*, as stated by Professor Morse, while the cable was being run out rapidly in deep water.

Tobacco Manufacture.

There are fifty-six manufacturers of the staple in Richmond, Va., whose united capital amounts to four or five millions of dollars. More tobacco is raised in Virginia than perhaps in any other State in this country. It is here that the choicest specimens of the weed assume the shape which commends it to the regard of devoted chewers everywhere. Tobacco is put up in as many different ways almost as there are chewers. There is as much difference between the ideas of the Yankee and the Southerner on this question of taste as there is on any other matter. The former likes his "pigtail" plentifully sweetened, and liquoriced to a degree; the latter, the less sweetening you put in, the better the tobacco. Buyers congregate here who purchase for all parts of the globe. Foreign governments are supplied by agents who reside here for that purpose. With many citizens the road to wealth has been *via* tobacco.—*Richmond South.*

Issued from the United States Patent Office

FOR THE WEEK ENDING FEBRUARY 9, 1858.

[*Reported officially for the Scientific American.*]

IMPLEMENT FOR HOLDING OPEN SHOES, BAGS, &c.—John Allender, of New London, Conn. : I claim a pair of forceps with one jaw provided with a plate, for the inside of a shoe, sack, or other article, the other jaw carrying two arms, one to clamp the shoe, sack, or other article, against the first-mentioned jaw or plate upon it, and the other arm carrying a bar or plate, to spread the opening in the shoe, sack, or other article, substantially as described.

I also claim making the bar that carries the arm that spreads the shoe, sack, or other article, adjustable, substantially as described, so that the forceps or apparatus may be adapted to shoes and sacks of various sizes.

SEWING MACHINES—Benjamin J. Angell, of Attleborough, Mass. : I am aware that a method of causing the cloth to progress regularly, in feeding, by the joint action of the surfaces between which it is clamped, has been previously patented by Allen B. Wilson. I would not, therefore, be understood as claiming such device for this purpose.

I claim the combination of the grooves, S S, of the presser with the barbs, t t t t, of the feed bar, and the surfaces, a a and h h, with the thumb screw S', arranged and operating substantially and for the purpose as set forth.

PUMPS—William Boyers, of Mount Carroll, Ill. : I do not claim the employment of two pistons working in the same cylinder.

But I claim the combination of the connecting chain, h, with the lifting rods, b c, and with double pistons, G H, working in a single cylinder, A, substantially in the manner and for the purposes specified.

HYDRO-CARBON VAPOR LAMPS—Robert R. Crosby, of Boston, Mass. : I do not claim applying a separate wick tube and wick to a main reservoir and its wick tube, such being for the purpose of vaporizing the fluid in the wick of the main reservoir by flame generated by combustion of any of the fluid contents of the said reservoir.

But I claim, in a hydro-carbon vapor lamp, combining an auxiliary and separate reservoir, H, with the main reservoir, A, and its main and auxiliary wick tubes, D D G, so that while a fluid rich in carbon may be used in the main reservoir, alcohol, or a fluid having less or very little carbon, may be used in the auxiliary reservoir, and be burned on the wick thereof, extending through the auxiliary wick tube.

I also claim arranging the separate auxiliary reservoir, H, of the auxiliary wick within, and separate from the main reservoir, as specified.

I do not claim applying to the auxiliary burner chamber a closing slide to rotate on the wick tubes, D D, and regulate the amount of air to be admitted into the said chamber, for the ordinary purposes of the flame on the wick.

But I claim the arrangement and application of a flame guard, K, constructed substantially as described, to the auxiliary wick tube chamber, so as to extend and slide around the upper part of said chamber, have such chamber open beneath it, and operate to spread the heat uniformly against the under side of the vaporizing vessel, E, substantially as specified.

CARDS FOR CURRYING CATTLE—C. S. Dickerman, of Lansingburgh, N. Y. : I disclaim a wooden cylinder furnished with teeth, and furthermore, restrict my claim to a hand card made as described.

I claim a hand card consisting of a flat wooden stock having straight wire teeth forced into, but not through, the stock, as described, and provided with a handle, C, or its equivalent, to fit the card for hand use, as set forth.

GRINDING MILLS—H. V. Duryea, of Fulton, N. Y. : I claim, first, The method, substantially as described, of constructing metallic rollers for grinding mills, when the parts of each roller are connected by the contraction of metallic rods, as set forth.

Second, I also claim the method, substantially as described, of attaching the hopper, A, with the rollers, B and C, for the purpose mentioned.

Third, I also claim the described method of attaching hoppers, in combination with rollers, constructed as set forth.

RAILROAD CAR AXLE BOXES—George W. Geisendorff, of Indianapolis, Ind., and Jacob C. Geisendorff, of Cincinnati, Ohio : We claim the lug, C D E F G, constructed as set forth, or equivalent device, in the described combination with the axle, A, and box, C.

LUBRICATING APPARATUS FOR JOURNAL BOXES OF RAILROAD CARS—Jacob C. Geisendorff, of Cincinnati, Ohio : I claim the guards, E, springs, G, ratchet wheel, H, and pawls, I I', or substantially equivalent devices, in the described combination with the lubricating roller F, and axle, A A', for the purposes set forth.

MACHINE FOR CUTTING TENONS ON SPOKES—Mahlon Gregg, of Philadelphia, Pa. : I claim securing the cutters at an angle, substantially as and for the purpose set forth.

I further claim the combination of cutter carrier, P, bearer, Q, and tubular piece, G, substantially as and for the purpose specified.

SHINGLE MACHINE—William Gregor, of New York City : I claim the arrangement of two slides turning upon centers, and acted upon by inclined surfaces, which latter are operated by the motion of the bed-plate, as described.

I further claim the attachment of a double-edged knife to the bed-plate, in the manner described, moving back and forth with said bed-plate, and at the same time being acted upon by the above-mentioned slides, in the manner as and for the purpose set forth.

POTATO PLANTERS—Edward E. Hawley, of New Haven, Conn. : I claim, first, The combination of the planting wheel, E, with the knife or cutting blade, G, to effect the purpose named, as set forth.

Second, The combination of the planting wheels, E E', with the hopper, F, when arranged in relation to each other, in the manner and for the purposes described.

ALARM LOCKS—Horace L. Hervey, of Windsor, Conn.: I claim first, The main lock bolt, G, or its equivalent, used for the purposes as set forth and described.

Second, The sliding notch wheel, F, for the purpose set forth and described.

Third, the slide piece, D, when used in connection with sliding spring knobs, L.

Fourth, The sliding spring knobs, L, for the purpose set forth and described.

Fifth, The sliding spring ratchet, C, when used for the purpose set forth and described.

STAVE MACHINE—Elias Moore, William Clark, and James Lindsey, of Shelbyville, Ind. : We claim the combination of parts, acting as a whole, substantially as specified, and for the purposes set forth.

MODE OF BURNING BRICK—A. J. Mullen and R. Hall, of Greensboro', Ala. : We claim the construction of a brick kiln with an inclined bottom, a, leading to the drawing pit, when used in combination with the irregular setting of the brick in the kiln, as set forth.

MUSICAL INSTRUMENTS—Ureli C. Hill, of Jersey City, N. J., and Charles F. Hill, of New York City : We do not claim the cells as agents, in conjunction with forks, to produce a musical instrument; nor forms nor modes of constructing cells.

But we claim, first, The wing and hammer wire to fork prongs, as used in this instrument.

Second, The placing of keys, action, and cells in lateral or oblique ranges, the cells and keys crossing each other at right angles, and the manner of suspending cells.

Third, The yoke, and method of holding the fork to the cell.

Fourth, The arrangements of dampers and damper levers to the keys and forks, so as to damp the forks on their edges.

Fifth, The transverse upright action for the movement of hammers across, instead of parallel with, the keys, all substantially as shown and described.

HOMINY MILLS—Phillip Homrighaus, of Royalton, Ohio : I claim the construction of the gage plate, M, when used in connection with the hopper, L, and trough, K, substantially as and for the purposes set forth.

HARVESTERS—M. G. Hubbard, of Penn Yan, N. Y.: I claim the attachment of the spring directly to the finger bar, and placing the shoe on one side thereof, and directly in the track of the supporting wheel, as specifically set forth.

WASHING MACHINE—Edward Julier, of McConnellsville, Ohio : I claim the construction and arrangement of the sliding carriage, composed of the side pieces, q q q q2 q2 q2, the compensating yoke, y y, the pressure spring piece, z z, the plain roller, U, the ratchet roller, V V X X, the compensating roller, W W, the staff rod, k2, and notched pressure beam and weight, L2 L2 n2, combined and operating together with the driving pitman rod, b2 b2, as set forth.

I also claim the jointed shoulder pieces, d2 d2, the elbow lengths, e2 e2, and fore arms, f2 f2, when arranged and combined as set forth, and operated in connection with an ordinary washtub or board.

STRAINING RECIPROCATING SAWS—G. P. Ketchan, Jr., of Bloomington, Ind. : I do not claim, broadly and separately, connecting a saw at both ends to crank pulleys.

But I claim connecting the slides, c c, at both ends of the saw to crank pulleys, a a, on the shafts, B C, by means of pitman, b, the opposite ends of the shafts, B C, being connected by the crank or cranks, E, and pitman or pitmen, F, whereby the shafts are made to move simultaneously, and the same relative positions of their cranks and working parts connected therewith, retained at all points of their movement, and the saw, D, operated or driven, and kept equally strained, or at the same degree of tension, at all points of its stroke, substantially as described.

[For a further description of this, see another column.]

REMOVABLE WINDOW SASH—Robert H. Kirck, of Utica, N. Y. : I claim jointing the sash or sashes of a window at the center, substantially as described, so that they may be removed from the casing without detaching the parting beads or stop strips, the sash or sashes being provided with a catch, or any equivalent device, to prevent the casual folding of the same.

[The object of this invention is to admit of the sashes of windows being removed from their frame or casing without detaching the stop strips or parting beads; this is effected by the employment of a sash, divided and hinged in the center, and also provided with a catch, so that it cannot come out by accident, but can only be removed by a person who releases the catch.]

SCRAPERS FOR GRINDING MILLS—Thomas E. Little, of Janesville, Wis. : I claim the employment of the rotating head, b, having rods, e, and scrapers, f, attached, said parts being arranged to revolve slowly around the runner, at whatever speed the latter may be driven, substantially as and for the purposes set forth.

[For description of this invention, refer to another page.]

FLOUR BOLTS—Samuel G. McMurtry, of Memphis Tenn. : I am aware that fans have been previously applied to bolts to effect the purpose described, and I do not, therefore, claim the employment or use of the fan, in itself considered.

Nor do I claim the employment or use of the rotating beaters or brushes within the bolt, for they have been previously used.

But I claim the arrangement of the bolt frame, b, bottom plate, r, flanches, l l, plates, c d e, and spouts, E F G H, substantially as described, whereby the current of air is prevented from drawing through the center of the bolt, but is spread so as to pass along near the surface of the bolting-cloth, while the flour is not only suspended in a current of dry air, but is conducted through the cloth out upon the annular plates, and down the peculiarly-arranged air-tight spouts to the place of storing, nothing whatever being able to escape, except through the proper channel.

[For further information concerning this invention, see another page.]

OPERATING RAILROAD STATION PUMPS—William McVeigh, of Boone, Ill. : I claim the combination of the roller, I, the inclines, C C', the levers, D D', the lever, J, and pump, H, arranged as described, for the purpose set forth.

ATTACHING INDIA RUBBER SOLES TO BOOTS AND SHOES—Abram T. Merwin, of New Haven, Conn. : I claim securing a sole of india rubber, gutta percha, or other like material, to a shoe, by means of a binder, as shown and described.

MANUFACTURE OF WROUGHT IRON RAILROAD CHAIRS—James Milliken, of Philadelphia, Pa. : I claim the manufacture of railroad chairs by forming a pile of the side pieces b and b', in connection with the pieces, a and d, in the manner and substantially as described.

CLAMP FOR HOLDING RECTANGULAR PIECES OF WOOD WHILE BEING BORED, &c.—Henry Miller, of Grafton, Va. : I claim the described apparatus for adjusting, holding and clamping bed-posts, whilst their previously-bored holes are having the screw threads cut therein, as explained and set forth.

CHURN—Enos Page, of Streetsborough, Ohio : I do not claim the simple use of spiral dashers, arranged so as to force the cream alternately in opposite directions, being aware that such is now new.

But I claim the arrangement of the spiral wing dashers, E E', on opposite side and ends of the dasher shaft, in combination with a cylindrical churn body in such a manner that the outer radial edges, d d, thereof, shall respectively sweep, or move in close proximity to, the ends of the churn body, and their spiral edges, e e' e' e', sweep respectively one-half the length of the periphery of the churn body, substantially in the manner and for the purpose specified.

MACHINES FOR CUTTING BRUSH FROM COTTON FIELDS—Elias Peck, of Canton, Ill. : I claim the arrangement of wheels, S, knives, b, cams, E, and bar, F, the whole being arranged and operated in the manner and for the purpose set forth.

PEDALS FOR ORGANS, &c.—Thomas Robjohn, of New York City : I claim the described arrangement of organ pedals in the radial and concave form, to facilitate the performance thereon, as set forth.

LEAD PIPE MACHINE—Charles E. Rockwell, of New York City : I do not claim, broadly, the making of the die-plate of greater diameter than the bore of the cylinder, for I am aware that this is seen in Kerh & Krenznach's plan, Voight's Technological Journal. But in this device the die-plate, although larger than the bore of the cylinder, is not adjustable in a lateral manner, or by set screws.

But I claim having the space between the adjustable die-plate, e, and the base-plate, m, covered or protected by the end of the lead cylinder, the whole constructed as and for the purposes set forth.

JOINTS FOR SHEET METAL ROOFS—Stephen Scotton, of Richmond, Ind. : I claim forming a three-leaved metal plate, shaped thus, T, by soldering or rolling iron, or other metal, for securing the joints of metal roofs, substantially as set forth.

WASHING MACHINE—W. H. Tambling, of Berlin, Wis. : I do not claim the employment or use of corrugated and plain cylinders or rollers in washing machines, for they have been previously used.

Neither do I claim placing said rollers in elastic or yielding bearings, irrespective of the arrangement shown, whereby the bearings of the cylinder, B, may be rendered either elastic or permanent, as desired.

But I claim the combination of the corrugated or fluted cylinder, B, and elastic or yielding frame, C, provided with rollers, l, when the bearings, c, of the axis, a, of the cylinder, B, are fitted in an elastic or yielding and adjustable frame, and the whole arranged as shown, for the purpose set forth.

[This washing machine consists of an elastic frame, and a corrugated or fluted rotating cylinder, which work together. A full description, with an engraving, will probably appear in a future number of the SCI. AM.

PAINTING AND VARNISHING MACHINE—H. Thayer and L. L. Martin, of Warsaw, N. Y. : We claim the mode of flowing paint, size, varnish, or any liquid substance, on artices of wood or iron, by passing them horizontally, or otherwise, through holes cut in two sides of any vessel, while said vessel is filled with the liquid substance, to be used as represented, said holes to be cut directly opposite each other, and to be appropriately packed with flannel, fulled cloth, or any other appropriate packing, as described by the letters, X X X, and figure, I I, and to correspond in shape with the articles to be run through, as set forth.

We also claim the funnel-shaped india rubber tube, with its packing, as represented, and its application to painting, sizing, and varnishing articles that diminish in size from one end to the other, or that vary in diameter.

We also claim the hollow brush, k, standing on the further side of the chamber from the operator, and its adaptation, as described.

COLLAPSIBLE BOATS—N. Thompson, of Brooklyn, N. Y. Patented in England December 3, 1857 : I claim a sectional, collapsible boat, made up of eight or more sections hinged together, and constituting a boat similar in appearance to an ordinary small boat, the whole constructed substantially in the manner described.

LAP-JOINTS FOR BELTING—Henry Underwood, of New York City : I claim the straps, b, placed on the rivets, a a', which laps through the outer and inner ends of the laps, or "skived" portion of the parts or ends, A B, of the belt, as shown, so that the straps may project over the outer thin ends of the laps, substantially as and for the purpose as set forth.

[This invention is designed to prevent the ruffling or turning up of the outer ends of the laps, which is generally caused by the friction produced as the joint passes over pulleys, chains, &c., and also to prevent the cutting of the outer ends of of the laps by the heads of the rivets, in case the cement loses its adhesive property or gives way, and the connection thereby is thrown entirely on the rivets.]

GRAIN AND GRASS HARVESTERS—Aaron VanDuzen, of Goshen, N. Y. : I claim the arrangement of cutters and fingers upon both sides of their respective bars, whereby the grass may be cut upon either side of the finger bar, A, as and for the purposes set forth.

[This is a new and improved cutting device for harvesters, consisting in having a series of cutters attached to a bar, the ends of which are pivoted to pulleys, having a chain or belt passing around them. The pulleys are fitted into recesses in the finger-bar and the cutters owing to the peculiar movement of the bar, which is actuated by the pulleys, work with a curvilinear motion through the slotted fingers and the stationary cutters fixed to the fingers. The object of the invention is to provide a cutting device that will work with a small expenditure of power, and one that is not liable to become choked or clogged, and that may be driven with an easy motion without any jarring or vibration of the machine.]

CORN HUSKERS—F. M. Walker, of Greensboro', N. C. : I claim the cone, H, armed with the spring teeth, J I, in combination with the guide bars, L L, and upright piece, F, the whole being constructed, operated and arranged in the manner and for the purpose set forth.

PLOWS—George Watt, of Richmond, Va. : I do not claim of itself the inclination of the land side towards the mold-board, for the purpose of leaving soil overhanging the furrow, as such device broadly considered is not new.

But I claim constructing mold-board and land side of cylindrical surfaces of equal diameters, intersecting along the cutting edge of the plow, in combination with the curved standard, S, the whole being constructed substantially as and for the purposes set forth.

MACHINES FOR PLANTING POTATOES—T. B. Whyte, of Greenwich, N. Y. : I claim the arrangement of slide, E, knife, e, and adjustable hoard, V, with hoppers, L and L 2, in manner and form and for the purpose set forth.

BOTTLE STOPPER—J. B. Williams, of New York City; I am aware that a ball valve is not new, and I lay no claim to it in its general application.

But I claim a bottle stopper composed of a metal tube having proper flanges, one end of which is covered with cork, and its top furnished with a ball valve, which moves between guides attached to the tube or its flange, the whole being made as set forth.

COTTON GINS—L. J. Chichester (assignor to H. G. Evans, Saml. Barstow, and D. L. Winteringham), of New York City : I do not claim broadly the employment or use of grooved rollers in themselves considered, without reference to their application to cotton gins, for grooved rollers are used in sheet metal working devices, crushing machines and various other machines for different purposes.

But I claim the rollers, A B, grooved circumferentially as shown, and having the peripheries of their flanches, b, smooth or serrated; the rollers being fitted together with or without the elastic wings, e, substantially as and for the purpose set forth.

[Full particulars of this invention will be found in another column.]

CORN HUSKERS—A. R. Davis (assignor to himself and B. D. Moody), of East Cambridge, Mass. : I claim, in combination with the stationary gaurds, H and F, cone C, and knife, E, the elastic or spring rests, e, operating substantially as described.

CORN HUSKERS—Daniel Lombard (assignor to himself and G. P. Richardson), of Boston, Mass. : I claim a corn husker, constructed of a chuck mounted on a tubular shaft or provided with a central cavity, and having cutters and spurs arranged with respect to the bore or cavity, substantially as specified.

FIRE-ARMS—F. D. Newbury (assignor to Richd. V. Dewitt, Jr.), of Albany, N. Y. : I claim the main spring, S, arranged as described to operate the hammer and trigger simultaneously where the hammer is cocked by the trigger.

I further claim the ratchet wheel lever and pin, in combination, arranged as described, so as to revolve the cylinder, and to hold it firmly in the act of firing.

I further claim the combination of the main spring, trigger, ratchet wheel, lever, and pin, for the purpose of cocking the piece, revolving the cylinder, holding it in place, and firing the piece, by one movement of the finger upon the trigger, substantially as set forth in the specification.

CANE GUN—John F. Thomas (assignor to himself and Saml. Remington), of Ilion, N. Y. : I claim, first, Connecting the case, A, and barrel, B, by means of the hammer and its rod, F, and the trigger block, and trigger, as set forth.

I also claim, in combination with the case and barrel, the catch spring, e, for holding the case and hammer, when the arm is cocked as set forth.

I also claim the continuous grooves or shoulder around the end of the rod, F, so that said rod may turn in its bearings, without preventing the sear from catching it, whenever drawn back past it, as described.

I also claim the combination of the trigger block, G, trigger, i, with its sear 3, and spring 4, and the hammer and its rod, substantially in the manner and for the purpose set forth.

HAND CORN PLANTERS—Joshua Fairbank and E. C. Durfee, of Leon, N. Y., administrators of the estate of J. B. Fairbank, deceased, late of New York City : The particular improvements which constitute the said invention, and which are claimed as having been originally and first invented by the said John R. Fairbank, are—

First, The adjustable measuring cups, B, with a movable bottom operated by the upward motion of the cups relatively to other parts, as specified.

Second, The thruster, S, and slide, V, or their equivalents, when used for giving the side pressure to the corn, in the manner and for the purposes above stated.

HYDRANTS—Kingston Goddard, of Philadelphia, Pa.: I do not wish to be understood as claiming, broadly, the use of a plunger, or the construction of a self-closing valve.

But I claim, first, The plunger, B, operated upon by a weighted handle, in combination with the self-closing spring valve, C, the whole constructed and operating, substantially as and for the purpose specified.

Second, The construction of the shell, A, in two sections, in combination with the removable valve seat piece, D, and bottom piece, e, the several parts arranged and operating substantially as described, for the purposes set forth.

RE-ISSUES.

SCYTHE FASTENINGS—Pinckney Frost, of Springfield, Vt. Patented Jan. 11, 1853—Re-issued Feb. 9, 1858 : I claim the combination of the loop-bolt and set ring, constructed and operating substantially in the manner described and set forth.

CORN PLANTERS—Martin Robbins, of Cincinnati, O. Patented Feb. 10, 1857—Re-issued Feb. 9, 1858 : I claim first, The method set forth of discharging seed from a plow or drill by means of the anchored chain, i, j, k, or its equivalent.

Second, The chain or cord, i, j, k, adapted substantially as set forth to operate the discharging mechanism of a seed planter.

Third, In the described combination with a suitable chain, or cord, I claim the arm, f, provided with a vibrating claw, or tappet, g, or substantially equivalent devices operating the seed delivering mechanism as set forth.

Emigration to the United States and British North America.

From returns furnished by the Government Emigration Office, we learn that in the March quarter of the year 1857, 53 ships, of an aggregate tunnage of 73,360 tuns, left Liverpool for the United States, carrying 273 cabin and 16,453 steerage passengers; in the June quarter, 90 ships, of 126,517 tuns, with 632 cabin and 45,311 steerage passengers; in the September quarter, 52 ships of 75,325 tuns, with 828 cabin and 53,111 steerage passengers; and in the last quarter, 37 ships, of 53,033 tuns, with 376 cabin and 10,611 steerage passengers—making an aggregate for the year of 232 ships, 328,235 tuns, conveying 2,108 cabin and 95,486 steerage passengers. To Canada direct, in the June quarter, 12 ships, of 12,211 tuns, with 6 cabin and 4,818 steerage passengers; and in the September quarter, 3 ships, of 2,990 tuns, with 6 cabin and 1,083 steerage passengers—making a total to Canada of 15 ships, 15,201 tuns, carrying 12 cabin and 5,901 steerage passengers. To New Brunswick, 1 ship, of 966 tuns, was dispatched in the June quarter, with 7 cabin and 70 steerage passengers.—*Exchange.*

Russia made to Pay up.

From the Baltimore *Patriot* we learn that Thomas Winans, of that city, has recovered a claim of five million dollars against the Russian government, which makes his share of the proceeds of freight and passenger travel over the railroads of that country, seventeen millions of dollars! It seems that in his contract with Russia, he was to receive a percentage on all freight and passenger travel on the railroads of that country, and the government thought that there was no necessity to pay this tax on the soldiers who were carried to the Crimea during the late war. Mr. Winans thought differently, and employed J. H. B. Latrobe to prosecute his claim in a legal way, which he has done, and succeeded. We understand that Mr. Latrobe received a fee of $10,000 a month, independent of expenses, and when he reached Baltimore he was presented with a check for $100,000. Mr. Winans has purchased a tract of land with water front at Canton, where, it is said, he is going to build a number of magnificent vessels of war for the Russian government, having just made a contract with them for the work.

Experiments with Paints.

We have received from John Ewen, Jr., of Williamsburg, L. I., an interesting account and proofs of experiments conducted by him to test the comparative durability of certain pigments, and the vehicles employed with them as applied in house painting. During the last twenty-three years, he has been practically engaged in house and sign painting, and in that period many questions had been asked of him regarding the best paints to use. "To these," he says, "I gave the best answers that a general and superficial observation would warrant; but not being reliably answered, they increased fourfold as the zinc paint came to be generally used. It was at this time (September, 1851) that a method of demonstration suggested itself. I forthwith procured two strips of board, and marked them into compartments, and after numbering them 1, 2, up to 11, I coated them in the following manner:—No. 1 received two coats of white lead mixed with raw linseed oil, and no dryer; the paint was laid off or finished with the brush, stroked up and down. No. 2 received the same coating of material as No. 1, but was finished with the brush passed right and left, crosswise. No. 3 was given two coats of white lead, raw linseed oil, and considerable spirits of turpentine in the first, but only a little in the last coat. No. 4 received two coats of white zinc and raw linseed oil—all mixed with what is called "patent dryer." No. 5 the same as No. 4, but with no patent dryer. No. 6 received a first coat of white lead and Paris white, equal parts, and clear white lead for the last coat, with raw linseed oil as the vehicle. No. 7 was given two coats of white lead, with *boiled* linseed oil. No. 8 three very thin coats of white lead, with raw linseed oil. No. 9 got a very heavy prime coat of white lead, and a very thin second and last coat, with raw linseed oil. No. 10 the reverse of No. 9, namely, a thin prime coat and a heavy finishing one. No. 11 received two coats of Paris white and white lead, equal parts, with raw linseed oil. After this was accomplished, and the paints well dried, the two pieces of board were placed in a position where they were exposed to the weather—its sunshine and its storms—for years."

The following are the results obtained:—"The white lead paints exhibited a decided superiority for durability over the zinc, and the squares finished with the brush up and down in vertical lines are decidedly superior to the one laid with the brush right and left. [This is undoubtedly due to the moisture being allowed to flow down more freely than in the square finished with the brush run transversely, which left small cross ridges of the paint.] No. 9, which received a very heavy prime coat, is white and chalky; No. 10 is darker in color, but not so chalky; No. 11 is superior to the two preceding numbers. Of all the squares, however, No. 7, consisting of two coats of white lead, with boiled linseed oil, is by far the best—the smoothest and closest."

Mr. Ewen has left the boards with us, and the apparent results are such as have been stated. The experiments are valuable, because they afford positive data regarding paints, and the manner of applying them to the outside of buildings, so as to obtain the best effects. The coating of white lead, with raw linseed oil and a little spirits of turpentine, looks well, and strikes us favorably. Raw linseed oil, in white lead, without turpentine, imparts a greasy appearance to white paint when first put on; a little turpentine, therefore, improves its appearance, but care must be exercised not to add too much, because when in excess, it imparts a saponaceous character to the paint, which makes it become chalky, and scales off rapidly by exposure to rains and winds.

Selling Coal by Weight.

Messrs. Editors.—For many years our law-makers have endeavored, by various enactments, to secure accurate weight to the purchasers of coal and other articles. A bill is now before our Legislature, the provisions of which will compel the coal-dealers of this city to weigh every load of coal at the door of the consumer. This will involve the necessity of portable scales, or scales attached to every coal cart. The retail coal trade of this city alone is estimated at half a million of tuns per annum. Were only the nominal tax of five cents per tun exacted from the above business, for the use of a suitable self-weighing cart, it would secure to the fortunate inventor the comfortable sum of $25,000 per annum.

Should the bill before our Legislature be adopted, it will, doubtless, be but initiative to laws of a like character in other States having such large coal-consuming cities as New York, Boston, Philadelphia, &c.

Who will be the first, among your host of ingenious readers, to furnish us with an accurate, simple, and durable self-weighing cart?

A Coal Dealer.

Philadelphia, Pa., February, 1858.

[By referring to No. 17, Vol. XII, of the Scientific American, our correspondent will find "an accurate, simple, and durable self-weighing coal cart," patented by one of his own townsmen.—Eds.

Encouragement to Old Folks at Home.

A short time ago, the London *Times* gave an account of an old lady more than eighty years of age who had cut her third set of teeth, and her features, it is said, have now the juvenescence of thirty years. Many such facts could be collected. We are therefore bound, perhaps, to give credence to certain good authorities when they assert that such natural changes have occurred in the entire body, that the powers of youth have been restored to persons with whom they have been familiar. "Velescus de Taranta (let us by all means cite authorities) relates that there was an abbess in the nunnery at Monviedra, who reached the great age of a hundred years, and was then very infirm; but the lost powers of nature unexpectedly came back to her. Black hairs sprouted from her head, and the white hairs were thrown off; all the teeth returned into her mouth; wrinkles were lost from her face; her bosom swelled, and she became at last as fresh and lovely as she had been at the age of thirty. Many flocked to see this marvel, and no doubt paid for the privilege; but the abbess did not readily suffer herself to be seen, for she was ashamed (she said) of the recollections that her restored beauty awakened."

It is also asserted that there are means in nature of restoring youth. In *Household Words*, it is said, that there is a fountain in the Island of Bonica which restores youth to those who drink its waters. Certain of the inferior animals are also acquainted with herbs that restore youth to them; the stag recovers it by eating snakes, and the snakes recover it by eating fennel. Italian ladies used to eat snake-meat, in order to retain their freshness and youth. Johnston, in his *Chemistry of Common Life*, says—"Before a Circassian beauty is sent to the seraglio at Constantinople, she eats about an ounce of a very choice and peculiar description of manna (the Sinai manna), every day for eight or ten weeks. This has the effect of imparting *embonpoint*—or rather, of beautifully rounding all the angles of the human frame; and without the least exaggeration the result is a form as beautiful as a living Venus de Medicis. This manna is also much esteemed in Syria as a remedy for affections of the chest." Roast hare is also said to be a great preserver of beauty.

Several well-authenticated instances are likewise recorded of rapid change in the color of the hair. By an inscription on a tombstone at Breslau, it appears that one John Montanus, who was a dean there, recovered the color of his hair three times. It is next to impossible to deny the great age of the patriarchs—of Methuselah, of Cainan, and of Enos. That they passed into age at the ordinary period of life familiar to us, and then continued with the same appearance of age and decrepitude for the remainder of their days, is not probable; far more reasonable is it to suppose that they recovered their youthful powers at certain periods, like a plant that putteth on youth every spring. In our "seventh age" we not unfrequently again become "childish." Does it therefore appear incredible or impossible than man may occasionally, after his threescore years and ten, again exhibit the powers and physical qualities of youth?

Septimus Piesse.

Re-pointing Gold Pens.

Messrs. Editors—In the number of the Scientific American dated the 13th inst., you state, in answer to a correspondent, that gold pens cannot be re-pointed; and you give as a reason, that in soldering on the point, the elasticity of the gold is destroyed by the heat. Hitherto this has been the case, but by recent discoveries and a series of experiments, I have surmounted all difficulties in re-pointing gold pens. It is true that heat destroys the elasticity of the gold, but I put on the point, reproduce the elasticity, and make the pen equal to new at a trifling expense.

L. H. Martin.

New York, February, 1858.

[We have seen the fruits of our correspondent's discovery, in a re-pointed gold pen, which, in every respect, is as good as when first made. The discovery is a very useful one indeed, as the gold pen business is now a considerable institution in our country.—Eds.

The Vibrations of Dams Settled.

At a recent meeting of the Boston Society of Natural History, as reported in the *Traveler*, Wm. Edwards, of South Natick, Mass., read a paper on the above subject, which effectually disposed of air behind the falling sheet of water, as some have supposed, being the cause of these vibrations. During the month of December, he made experiments on the dam at South Natick, where the vibrations are sometimes very violent. He erected a short flashboard on the top of the dam, at the one side, so that he could walk dry behind the sheet of falling water. Having been a believer in the theory of air causing the vibrations, he expected to find a violent wind under the sheet, but behold it was so calm that a feather descended as quietly as in a room, and the flame of a lamp was scarcely ruffled. He found the water as it fell to assume the spheroidal form, as before set forth in our columns, thus causing the vibrations.

The Texas Grasshoppers turned Cannibals.

The Gonzales (Texas) *Inquirer* says: "The grasshoppers, having about completed the work of destruction to vegetation, have, cannibal-like, fallen to work devouring each other; at least, they seem to be dying off very fast, and wherever there is a dead one there are half-a-dozen live ones around it, eating it up."

It is thus that there is a limit placed by natural laws to restrain the ravages of these insects, otherwise they would increase in such numbers as to threaten the destruction of the human species, by destroying all the vegetation necessary for man's sustenance.

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims on another page:—

Straining Saws.—In this invention the saw is connected by a pitman at the top and bottom to crank pulleys, so that the strain is equal at all parts of the stroke. Saws arranged in this manner may be put up at a moderate cost, and their parts are not liable to become deranged by wear; very little friction is produced by the operation, and the principle is equally applicable to large or small saws. It is the invention of G. P. Ketcham, Jr., of Bloomington, Ind.

Roller Cotton Gin.—This invention consists in the employment of two rollers grooved circumferentially and fitted together in the same plane, so that the projecting flanches of each roller will work in the grooves of its fellow or adjoining roller, whereby many advantages are obtained. It is the invention of Lewis J. Chichester, of New York, who has assigned it to H. G. Evans, S. Barstow, and D. L. Winteringham, of the same place.

Flour Bolt.—S. G. McMurtry, of Memphis, Tenn., has invented an improved flour bolt, which has for its object the keeping of the meal at a proper temperature while being bolted, in order that it may be rapidly and perfectly bolted, and the bolt prevented from becoming clogged. This is effected by the employment of a fan in connection with spouts and a bolt, so that the fan blows the flour through the bolt, and the different qualities catch on ledges and pass out through the spouts.

Grinding Mills.—Thomas E. Little, of Janesville, Wis., has invented an improvement in grinding mills, the object of which is to keep an unobstructed space all around the inner or upper stone, between it and the curb, so that the meal will be allowed to escape freely from between the stones, and the process of grinding will be expedited and the meal be kept in a much cooler state than in the ordinary mills. The invention consists in having a series of scrapers attached to a rotating head placed on the curb, the scrapers being fitted in the space between the curb and runner, and as they pass around within the space, clearing or scraping the ground meal, as it escapes between the stones into the discharge pipe. This is a most useful and practical invention, and is a valuable addition to all kinds of millstones.

The following inventions were patented last week, but were omitted for want of space:—

Planing away Ice in Rivers.—This invention provides an auxiliary attachment to steamboats, &c., which will enable them not only to remove the ice out of their track, but also pulverize or reduce it to such a state that it will rapidly dissolve into water, and thus not be capable of falling back into their path or track, and of blocking up the same before they have a chance to make their return trips. We regard this as a good contrivance and worthy of attention. It is the invention of R. W. Heywood, of Baltimore, Md., and was patented Jan. 26, 1858.

Cotton Press.—This invention renders the jack-screw press capable of pressing upwards, and thus affords greater convenience, as the pressing-box can be situated in the picking or ginning room, and the time and labor of transporting the cotton down to the bottom of the press are saved. It also simplifies the press so that negroes can superintend its management, renders the follower self-lowering, and lessens the weight of the rack bar, which carries the follower, without impairing its strength at the point where the greatest strain comes upon it. The press, as a whole, presents the perfection of simplicity and utility. It is the invention of Judge J. W. Bocage, of Pine Bluff, Arkansas, and was patented Feb. 2, 1858.

Metal Tips to Boots and Shoes.—The saving in shoe leather which the small metallic tip on the toe of a boot or shoe effects is very great, and the invention is one of practical utility. Children are remarkably fond of kicking out the toes of their little shoes, thus rendering them useless and making it necessary that another pair should be procured, although no other part of the former pair is injured. By the use of these tips, which may be made of silver, copper, iron or any other malleable metal, the boot or shoe may be worn until it is really "done up," and they are so secured that so long as any portion of the sole remains, the tip will be held fast. They do not increase the weight of the shoe above half an ounce or an ounce. It is the invention of G. A. Mitchell, of Turner, Me., and was patented on the 5th of January last. Economically speaking, there is no doubt of its value, as one pair of boots or shoes—men's, ladies' or children's—can be made to last nearly twice the time they would without the tips.

New Inventions.

Improved Cut-Off for Steam Engines.

This is a variable cut-off, which will be understood by the following description and accompanying engravings, in which Fig. 1 is an interior view of the steam chest of a steam engine, with a side view of the slide, cut-off, and mechanism for operating the latter; Fig. 2 is a longitudinal section of the slide valve, and its seat with a corresponding section of the cut-off; Fig. 3 is a perspective view of one of the seats of the cut-off valves, and Fig. 4 is a perspective view of one of the rings which are attached to the cut-off valves for the purpose of operating them.

A is the steam chest, B is a slide valve of the well-known kind, for the induction and eduction of the steam to and from the cylinder, working on a seat, *a a*, and moved by an eccentric on the crank shaft of the engine; *b b′* are the steam ports, and *c c′* the exhaust ports in the valve seat, the former communicating with the cylinder, and the latter with the exhaust pipe; *d d′* are the induction passages through the valve, and *e e′* are eduction cavities for forming communication between the ports, *b* and *c* and between *b′* and *c′*. D D′ is a sliding box containing two steam chambers, D and D′, and fitted to a slide on the back of the main valve, B; these chambers being separate from each other, and open on the side next the slide valve to communicate respectively with the induction passages, *d d′*, of the main valve, but being closed to the steam chest, A, except through the two hollow plug cut-off valves, E E′, whose seats, *f f′*, extend all the way through their respective steam chambers, so as to admit steam at all times to the interiors of the cut-off valves, E E′. These valves have each several very narrow openings, *g g*, in their sides, to correspond with the same number of openings, *j j*, in their respective seats, to admit steam from the chest, A, to the chambers, D D′, to be supplied through the passages, *d d′*, to the cylinder, and to cut it off by a very slight movement circularly in their seats. The two-chambered sliding valve box, D D′, is connected with one eccentric on the crank shaft, and from the movement of this derives the necessary motion for their operation.

The manner in which these valves are operated is as follows:—At one end of each valve is secured a collar, *h h′*, on which there is a projection, *i i′* (Fig. 4), which. from its form, may be termed a toe and heel piece; and inside the steam chest, on each end of the valve, is secured a piece, *l l′*, these are placed in such a position that the toes, *i i′*, will strike them, as the sliding valve box and piston arrive near the end of their stroke in either direction, and thus cause the cut-off valves to be opened in their proper turn by the time the piston completes its stroke ready to admit the steam to the cylinder as the slide valve, B, begins to open the port *b* or *b′*. On the same side of the valve as *i i′* are two bar G G′, each having shoulders, *k k′*, so arranged that the heels of the projections, *i i′*, will strike them after the piston has performed a certain portion of its stroke, and thus cause the cut-off valves to be closed in their proper turn. The cutting off is caused to take place sooner or later in the stroke by changing the position of the bars, G G′, longitudinally, to throw *k k′* farther apart or bring them closer together, and to admit of this they are attached to a stationary stand, I, by means of bolts, *m m′*, passing through slots, *c c′*, and provided with pins, *n n′*, working in slots, *p p′*, in the stand. The shifting of the bars is effected by a small shaft, *q*, passing through a stuffing-box in the steam chest, and having a pinion, *r*, on it, gearing into toothed racks on G G′.

It will be seen that the cut-off valves being hollow and receiving steam at the interior, and having openings at opposite points in themselves and their seats, must receive an equal pressure of steam on all sides, or in other words, they are balanced laterally, but owing to their taper form there is a slight pressure in a longitudinal direction tending to force them into their seats. To prevent the friction that would be produced by this pressure in turning the valves, they are caused to move a slight distance longitudinally out of their seats, by making the ends, *f f′*, project out of the valve box, D D′, with a spiral inclination (the form of a single turn of a screw thread) as shown at *s s*, Fig. 3, and making the inner faces of the collars, *h h′*, of corresponding form, as seen at *t*, Fig. 4.

CROSBY'S CUT-OFF FOR STEAM ENGINES.

Fig. 1

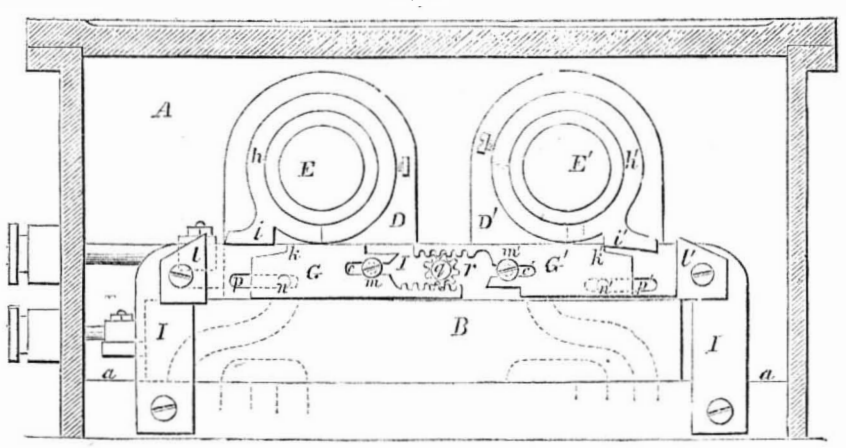


Fig. 2

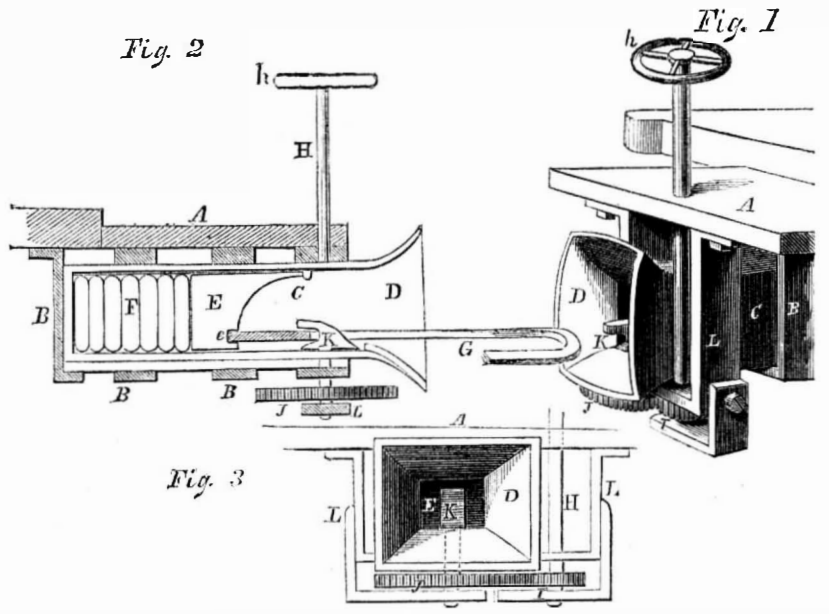
Fig. 3

Fig. 4

The jogs, *u u*, on the seats, *f f′*, and collars, *h h′*, serve as stops to prevent the turning of the cut-off valves further than is necessary in closing.

This cut-off prevents the waste of much steam, and consequently saves fuel. It is the invention of Addison Crosby, of Fredonia, N. Y., and was patented Jan. 19, 1858, from whom all further information can be obtained. A notice of it will be found on page 166 of the present volume of the Scientific American.

RAGUE'S PATENT CAR COUPLING.



There is an amount of carelessness on the part of railway managers, in regard to the life and safety of those in their employ, that is really shocking. It is by no means an unfrequent occurrence that brakesmen and others are crushed between the buffers of cars while coupling them together, and yet on the majority of railroads this old and barbarous system of coupling by hand is still persisted in, notwithstanding that there are many inventions patented which would entirely avoid the risk of accident. The invention we are about to describe is among the very best of these, because of its simplicity and security, and it possesses the great advantage of allowing the brakesman to uncouple the cars at whatever speed they may be going without stepping off the platform.

In our engravings, Fig. 1 is a perspective view of the coupling attachment, Fig. 2 is a section of the same, and Fig. 3 is an end view. Similar letters indicate the same parts in each. A is the platform of the car having links, B, suspended from it, which carry the box, C, having a trumpet-mouth D; the top of this trumpet-mouth or draw-head, should be perforated, so that the brakesman can see if the car be coupled or not. The box, C, contains a buffer, E, of the shape shown in Fig. 2, having a small recess, *e*, cut in it to fit the end of the coupling link or shackle, and may have a small spring above or below it between the box and itself, so as to allow any slight vertical play when one car is lower than the other, as on inclines; behind this is the buffer spring, F, which may be made of any efficient material. G is the coupling link or shackle. Through the platform there passes a shaft, H, provided with a wheel, *h*, by which the brakesman can turn it, and on its lower end is a small toothed wheel, I, gearing into another one, J, the axle of which carries the hook, K. This hook is made of wedge form, having a recess cut in its broadest end into which the shackle can fit, and in which it is kept by the buffer, E, and spring, F, being prevented from jerking out by its also fitting into the recess, *e*. The hook, K, is sunk a little below the bottom of D, so that when the link enters the drawhead, it cannot catch, but is at once met by the inclined side of K, and it passes over it into its proper place, from which it is impossible to dislodge it until the brakesman by the wheel, *h*, turns K directly round, when the link being outside, and the incline in, the shackle has no bearing, and is at once pulled out, leaving the cars detached. It is quite obvious that this can be done at any time without the slightest reference to the speed of the train. The gearing, I J, is supported by the brackets, L. There is no doubt that this is a thoroughly good coupling, and one which we hope may come into an extended use, as there is no liability of loss of life in its employment, and as far as we can see will answer much better than the method at present practised.

It is the invention of John F. Rague, of Dubuque, Iowa, and was patented by him Dec. 29, 1857. He will be happy to give any further information respecting the invention.

Removing Scale from Boilers.

We have received from Mr. E. Watson, of New Bedford, Mass., the description of a very safe and—as he states—an effectual method for removing scale or crust in steam boilers. It is as follows:—"Take of slippery elm or flax seed, or any mucilaginous vegetable matter, in quantity about three ounces to every horse power of the boiler—such as 24 ounces for an eight horse power engine—and throw it into the boiler. In a very short time afterwards, the scale will come off in flakes, and it can then be blown out by the blow-off cock. I have used the slippery elm with great success. Formerly I took two hours to get up steam, owing to the crust in the boiler. I now do the same in less than two-thirds of that time, and effect a great saving in fuel."

We are aware that flax seed had been used for this purpose before, and can endorse its good qualities. Indian meal and sweet potatoes also answer the same purpose. We have never known of the slippery elm bark being used before; but from its nature, we believe it accomplishes all that is claimed for it by Mr. Watson.

Steam Fire Engines.

A steam fire engine recently built by Messrs. Reany, Neafie & Co., of Philadelphia, Pa., for a hose company in that city, is stated to have given great satisfaction, and is designed for city use. In Cincinnati, steam fire engines and no others, we understand, guard the city from conflagrations. In New York, although prizes have been awarded for such machines by the city authorities, no such effective fire wardens have yet been added to the fire department.

Mr. R. Pook, the naval archictect, in Boston, is laying down the lines of an iron sailing vessel of about 450 tuns for Captain R. B. Forbes, as an experiment against a wooden sailing vessel. We hope this vessel will be more successful than the iron steamer lately built in Boston for the Pasha of Egypt.

Scientific American.

NEW YORK, FEBRUARY 20, 1858.

Wine Adulteration.

In our last number we promised to say something further on this interesting subject, and in doing so we shall call attention to one of the most remarkable pieces of impudence that has, for some time, fallen to our lot to chronicle. When we take wine with a friend, or buy it for our own use, we do so having an honest faith that it is pure; and we should little suspect that any one would purposely attempt to deceive us, by giving or selling us that which they knew to be bad liquor; yet we shall be obliged to doubt every wine, now that, (as many of our readers have doubtless seen,) a chemist advertises in the daily papers of this city, his "flavorings to produce, at a moment's notice, any desired liquor." We are told that great improvements have lately been made in this branch of business, *i. e.*, adulteration; and in consequence, we can purchase of the aforesaid chemist a gallon or more of the *essence* or *oil* of any desired liquor, and by merely adding one barrel of pure spirits, the liquor will be manufactured, "fairly comparing with the best brands." Brandy of "four times the value of the original cost" can be thus artificially made; and lastly, an oil for producing Catawba brandy is sold at a moderate price. These substances are all made and sold in New York, and no doubt, large quantities are consumed all over the country, the consumers imagining that they are drinking a genuine article.

This craving for foreign flavor and foreign names has in a great measure ruined the American wines as *American*, for, says a writer in Hunt's *Merchants' Magazine*, "a great evil in the manufacture of American wine consists in the endeavor to imitate foreign varieties—*adulterations and all*; and it is owing to this that we have no American wine." It is asserted that there is not a self-supporting vineyard in the United States, except the one producing Catawba; and with the exception of one or two in California, not a *fair* sample of American wine. The sparkling Catawba of 1848 was a peculiar wine, having a flavor that has never been imitated, and which had not been before known; but that is now scarce, and many inferior and adulterated varieties are passed upon the unwary for the genuine article. The only and perfect way to discourage adulteration is to patronize and encourage home-grown wines, and accept them as such. It is very probable that, at the onset, they may be a little more expensive; but if, by paying a little more, we can get a pure article, it is well worth the extra expense.

We are afraid that if a commission was appointed to examine the liquors retailed over bars in this city alone, they would find very few quite pure. In gin would be discovered turpentine and peppermint; in brandy, burnt sugar of the worst description, and bad spirits; whiskey would contain camphene; port wine, infusion of logwood; sherry, adulterated spirits called brandy, and other mixtures; champagne would prove old gooseberry; and claret would be difficult to examine, so multifarious would its ingredients be found. Without going any further than our own office, patents have been taken out through the Scientific American Agency for making champagne from cider, by impregnating it with carbonic acid; and we understand that the business is not only a successful but a large one. Another, for giving to wines and spirits, by artificial means, in six months, that age and maturity which, in a natural way, many years could only bring. In fact, it is impossible to enumerate the impositions that are practised, and it is high time that some examination of the purity of eatables and drinkables was made by the authorities of every city. There is no doubt that a board of examiners, chemists, microscopists, and others, having power to purchase, examine, and condemn all articles unfit for human consumption, would tend to increase the health of our cities and the honesty of dealers. Such a tribunal must some day be appointed, and the sooner the better, say we.

The Commissioner's Report.—How it takes.

The First Annual Report of Commissioner Holt, as it appeared in the SCIENTIFIC AMERICAN, three weeks since, has gained for him an unusual degree of approbation from inventors and patentees generally; and with but a single exception, it has received unqualified praise from the press. The exception referred to was an ill-mannered, ignorant, personal assault, in the shape of a communication through the columns of one of our daily papers, upon the motives of the Commissioner. We are well satisfied that the editor would never have admitted its publication, had he carefully perused the Commissioner's report. We think we could point out the author without much labored guessing. He had evidently suffered personal inconvenience at the hands of the new Commissioner, who has naturally been desirous to distinguish his friends from his enemies. The criticism was conceived in bad taste, was unfair in every respect, and exhibited a malice characteristic of that opposition which has attempted to lift its puny head above the Commissioner's rightful authority, for the purpose of interposing obstacles to the introduction of a policy more in accordance with the spirit of the law.

As an evidence, showing the good feeling elicited by this report, we would mention the case of an aged inventor, from a neighboring State, who called upon us a few days since, and expressed his warm commendation of the report. He remarked, with much emphasis, that "it was something new for a Commissioner to espouse, and plead so eloquently for, the cause of the inventor;" instancing, at the same time, the repulsive spirit with which he had been received at the Office on some former occasions. He also referred to the fact that he had now in his possession Letters Patent issued in 1807, and signed (as was then customary) by President Jefferson, and others subsequently signed by Madison, Monroe, and Jackson—those venerable worthies of other days. We believe our friend to be one of the oldest living inventors. He began to take out patents under the administration of Jefferson, has done so under nearly every succeeding administration, and, if we mistake not, he has claims now pending before the Patent Office. The commendation of one such inventor will compensate for the sullen growls and feeble kicks of a score of those who find their toes trodden upon and their selfish schemes frustrated by an independent and fearless Commissioner, who is evidently determined to administer the affairs of the Patent Office so as to commend it to the sympathy and favor of all just men.

The Office now occupies a much higher position in public estimation than at any previous period in its history. While other departments of the government appear to be suffering from the fearful pressure of the times, this alone shows signs of healthy progress. Why is this? In solving this query, we need not summon to our aid the Delphian gods, or "the spirits in the vasty deep." Nor need we heed the gloomy forebodings of those whose dirty intrigues have been frustrated. The Commissioner's just and humane policy is vindicating itself, and its fruits form an index finger to a solution of the cause of the present anomalous prosperity of the Patent Office.

American Horse-tamer in London.

The London *Times* graphically describes the triumphs of the famous American horse-tamer M. Rarey, of Groveport, Ohio, who has astonished all the royal family, from Queen Victoria and Prince Albert to the youngest scion, by taming their most fiery Arab steeds, almost at the word of command, and making them as tractable and gentle as lap-dogs. He communicated his secret (for a handsome sum, no doubt,) to Lord Paget and Sir R. Airey, who also performed similar feats.

Burning Fluid Recipe.

"To one gallon of 90 or 95 per cent alcohol, add one quart of refined turpentine or camphene, and half an ounce of pulverized gum camphor, and to the above add four grains of sulphuric ether; shake or stir the whole together, and let it remain from 15 to 18 days, occasionally shaking it to unite the ingredients. Then, if the composition is not transparent, you must add a sufficient quantity of alcohol, to bring it to the natural color of the alcohol before it was mixed; then it is ready for use. Trim your lamps, put your tubes in the lamps well filled with cotton-wicking, and your lamps will burn clear without affecting the wick, and give a brilliant light, free from smoke or smell. The above is called 'Foster's Patent Chemical Burning Composition.'"

A correspondent in Spring Valley, Rockland county, N. Y., sends us the above, stating that it has been sold by an agent to a great number of persons in that section of country, upon the assurance that it is superior for cleanliness, cheapness, and for giving a brilliant light, to all other burning fluids, mixtures or compositions now known; also that "it will not explode if exposed to fire, in any way it may be placed." Our opinion is solicited regarding its explosive character. It is, no doubt, a very good burning fluid, but no better nor cheaper than that made of superrefined turpentine and 95 per cent proof alcohol alone. None of the volatile burning fluids, so called, are explosive in the fluid state, and the agent referred to may have told the truth, but in such a way as to delude the purchasers of his recipe. All volatile fluids are dangerous, because of their liability to assume the gaseous form, mix with the atmosphere, and then become explosive when ignited. The above burning fluid is as dangerous to use as any of the burning fluids which are understood to be explosive, because it is just as volatile.

False Gas Meters.

In a communication to the New York *Daily Times*, Robert Prince, of Brooklyn, N. Y., asserts that all the meters made in this city, for the gas companies, are designedly constructed to indicate a consumption of about fifteen per cent of gas greater than the real amount. Some years since, he became interested with a manufacturer of gas meters, which were made with indexes that truly indicated the amount consumed, but the gas companies would not purchase them, consequently the manufacturer referred to was obliged to give up the business or attach false indexes to his meters; he now works to the order of these companies.

As gas companies provide their own meters, the persons who consume the gas are not able to tell whether they are deceived or not. Mr. Prince recommends that all gas meters be placed under a competent public "Meter Inspector," and that those who use the gas be permitted to purchase stamped meters where they please. He also asserts that no gas company can prosecute for debt, as they cannot prove by law the correctness of any gas bill, and for this reason they never prosecute, but cut off the supply of gas from debtors.

This is a question which deserves to be probed to its very core. If the gas meters are made as alleged by Mr. Prince, of course the public must be greatly wronged by the gas companies.

Artesian Wells in the Desert.

The great desert of Sahara, the terror of travelers, is apparently destined, under modern science, to become inhabited in many parts, and to yield food, not only for the traveler, but the dwellers in many pastural villages. The French have been experimenting in boring for water—artesian wells—in some of the oases, and their efforts have been crowned with success.

The *Moniteur Algerien* gives an interesting account of the newly-bored wells in the province of Constantine. The first well was made in the oasis near Tamerna by a detachment of soldiers, operations having been commenced in May, 1856. In two months they reached a supply of water which boiled up and discharged 1,065 wine gallons per minute. The joy of the Arab natives was unbounded at the news, which spread with unexampled rapidity, and they came from a great distance to witness the miracle. The *marabouts* or priests held a solemn service, and gave it the name of "the well of peace." They thanked the soldiers in the presence of the people, gave them a banquet, and escorted them in procession to the frontier of the oasis.

In another oasis—that of Sidi-Nached—which had been completely ruined by a drought, a well was also bored; and when the soldiers announced the rising of the waters, the natives rushed to it in crowds, plunged into the stream, and mothers bathed their children in it, to obtain a blessing. It has been called "the well of gratitude," and delivers about 1,142 gallons per minute. In another oasis a well has also been bored, which delivers 176 gallons per minute; and here some of the tribes commenced at once to plant date-palm trees, and give up their former nomadic life. In all likelihood these artesian wells will work a social revolution in the manners of the roving children of the desert. Instead of wandering from place to place—oasis to oasis—in search of pasture for their flocks and herds, as their ancestors before them had done for centuries, they will cluster round these fertilizing springs in well-built cots, and exchange the hunter's spear for the plow of the farmer, and thus take steps towards civilization.

Atmospherical Phenomena.

The Hingham (Mass.) *Journal* states that the atmospheric phenomena known by the name of "mirage" was witnessed along the line of sea coast in that region through the whole day of the 1st inst. The mirage is an optical illusion arising from an unequal refraction in the lower strata of the atmosphere, causing remote objects to be seen double, as if reflected in a mirror, or to appear as if suspended in the air. This phenomena was seen by thousands of persons on the coast. Ships were seen sailing in the air, and distant parts of Cape Cod were distinctly visible in the vicinity of Boston; large rocks and islands were clearly painted out upon the clouds, and various other singular appearances were seen.

Artesian Wells.

In another column of this paper may be found the advertisement of T. H. Leavitt, of Boston, for information concerning the boring of artesian wells. Mr. Leavitt has already accumulated a vast amount of information on the subject of deep borings, and in due time he will publish a volume on this topic, if sufficient practical information can be obtained. We are not aware of any good work on artesian wells, and we trust those interested will respond to Mr. Leavitt's call as set forth in his advertisement, so as to enable him to furnish a work on this subject which will be of national benefit.

Baldwin's Water Wheel.

Since publishing an engraving and description of this wheel, we have received testimony from certain reliable parties setting forth its good qualities. From the high source from which the recommendation comes, we feel confidence in commending the Baldwin wheel to any who may desire an economical water power. Mr. Baldwin's advertisement may be found on another page.

REMOVALS.—We understand that Commissioner Holt has made several removals in the Patent Office during the past week. Prominent among those who have been ousted we may name Professor Schaeffer, Chief-Examiner in the Chemical Department.

UP to the time of going to press we have been unable to procure a copy of the new Patent Bill. It is believed to contain very objectionable features, therefore we are anxious to get hold of it.

Gas-lighting.—Article I.

Amid the many applications of science to the wants of man and the uses of the arts, none more eminently distinguish the present era than the production and application of gas as an illuminator and heater. Indeed, nothing can better give an idea of the progress of civilization than a comparison, in this one item, of the humble peasant of to-day with the monarchs and emperors of old. The cottager, now-a-days, can have his dwelling illuminated with a cheap and brilliant light, while they had to go to bed at sundown, shivering with cold, or remain in the sooty atmosphere produced by the vacillating flame of a resin torch, or their magnificently designed but rude oil lamps, which required the most pungent and costly perfumes, brought from the far-distant East, to counteract the fetid smell emitted by the burning of unrefined oils and fats.

The history of gas-lighting is capable of being made out with some accuracy, as all the events which have characterized its past are of comparatively recent occurence, with the exception as to the priority of the invention, which is claimed by Winsor, a German; Murdoch, an Englishman; and Le Bon, a Frenchman. There is no doubt that one of these has the honor of being the first to make practically useful, and a public boon, the manufacture of gas by distillation; for an inflammable gas, which would give light and heat, had been known for ages. At Baku, on the Caspian Sea, an inflammable air, issuing from the earth, formed the sacred fire in the temple; the burning fountain of Dauphine is of the same origin; and scattered over the whole globe there are spots where this inflammable air bursts up like an atmospheric fountain; The Chinese had applied these fountains to a useful purpose, almost before the Europeans had any idea of their existence. The Chinese inserted bamboo pipes in the earth, and conveyed the gas through these to places where it was burned, and employed to light public establishments, heat baths, and evaporate salt brine.

In 1659, Thomas Shirley attributed the gas which came from the "burning well" near Wigan in England, to the subjacent coal beds; and in 1691, Dr. James Clayton, a clergyman, of Yorkshire, discovered that Newcastle coal, when distilled, gave a black oil, a watery fluid, and an *inflammable air*. This, then, was the true discovery of coal gas. He communicated his results and experiments to the Hon. Robert Boyle, who published them in the "Transactions of the Royal Society," in 1739. In the meantime, Dr. Clayton had prepared gas, washed it with water, and filled bladders with it, and placing these bladders under pressure boards, had forced it through pipes, and consumed it at a burner in his house! In all justice, Dr. Clayton ought to be looked upon as the inventor of gas-lighting. The Bishop of Llandaff, in 1767, confirmed Clayton's experiments; but although it had been demonstrated that coal gas could be used, nothing practical was done until 1785, when Philippe Le Bon, a French engineer, conceived the idea of collecting the gas evolved during the destructive distillation of different kinds of wood, for the purpose of lighting houses, by conveying it through tubes to jets, where it could be burned. In 1799, he communicated his discovery to the Institute—a scientific body just created by law in the midst of the French revolutionary turmoil; and in 1800, one of the first patents granted in France, under the general law, was that taken by Le Bon for a stove for heating and producing an economical light, and also affording a motive power applicable to any machine. In this patent the inventor embraced many devices, which, perfected in more modern times, have vastly contributed to the welfare of mankind. He probably aimed at too much, as is very often the case; and, in his desire of combining together a hot air furnace, a steam boiler, and a gas generator, before each of these devices was perfected, he failed to accomplish any substantial improvement. He lighted an hotel in Paris, but his gas was of so poor a quality that his experiments were not followed up, and he died ruined and broken-hearted.

In 1802, Winsor, a German, translated into three languages, and published Le Bon's communications to the Institute, and went to London himself to deliver public lectures on the subject, and exhibit the new light at the Lyceum Theater, which was the first public building lighted with gas in England; and Pall Mall, in London, was the first street in the world that was lighted by this means.

It is, however, well-established now, that, at the same time that Le Bon was making his experiments, Murdoch was going through similar trials, though with more success; in 1798, he established at the Soho Foundry—Watt's, where the first efficient steam engines were constructed—a gas apparatus which actually lighted that establishment. In 1806, he received a gold medal for a description of his process.

Nothing very extensive or really useful to the public had been accomplished before Clegg gave his attention to the perfecting of the system; and to him is certainly due the honor of making gas-lighting a general benefit. Before him, gas was merely a thick smoke, which was set fire to, and continued to burn until the pipes were gummed up with tar and other impurities, whilst the atmosphere was tainted with sulphurous vapors to such a degree that the whole body of learned men of the time, in almost every country, declared against the possibility of ever rendering that system available to the public. Whilst the system was being condemned, perhaps justly then, Winsor, who possessed indomitable energy, mixed with a large proportion of what some call "brass," undertook the formation of a large gas company. His prospectus and memorial to Parliament are models of their kind. To capitalists he promised an income of £712 for every £5 subscribed. To overcome the objections raised on account of the bad smell, he stated that breathing coal gas was a most healthy practice, and that, when people became aware of its value, far from fearing leaks in the pipe, they would even drill small holes in such as would be tight, so as to ensure a constant flow into their dwellings of the salutary emanations; and further, that *clever* physicians would recommend to keep bladders filled with coal gas under the pillows of their patients. A policemen declared that he could detect the features of a thief as well by gas-light as by daylight; a painter, that the varnish from tar was superior to japan; an agriculturist, that the water from coal would replace every other manure, &c. It is very probable that such exaggerated statements had the greater share in the ultimate success of the discovery, by enlisting the cupidity and prejudices of a large number of men who otherwise would not have given the subject any attention. Companies were formed and ruined; until, at last, the manufacture of gas was brought to a fair standard, and, by the intelligent and persevering application of science, has become what it is now—one of the most popular and valuable improvements of the age—one of the most extensive branches of productive industry—and, for the capitalist, one of the safest and most reliable investments.

As we stated above, Clegg was instrumental in perfecting gas-lighting, and to him most of the useful contrivances now found in gas-works are due. Murdoch and Winsor had only built retorts in stoves. The retorts or cylinders were filled with coal, a fire was lighted, and kept up until all the volatile matter was expelled. The stoves were then allowed to cool, and the residuum in the retorts withdrawn. A new charge is now introduced, the fire re-lighted, and the operation repeated. When it is considered that good gas is only produced at a cherry red heat, it will be understood how deficient this process was, since most of the oily substances contained in the coal passed over in the state of vapors, the heaviest of which condense before reaching the gas-holder. Clegg introduced the continuous process, by which a much larger volume of gas, of a better quality, was produced, and the quantity of tar materially diminished. Though comparatively good results are thus obtained, much room for improvement is left in that respect, up to this day, since tar, which is yet condensed in large quantities, contains the elements of gas. Clegg introduced the hydraulic main, which is a wide horizontal pipe, in which a large proportion of the liquids are condensed, and into which the outlet pipe from the retort dips, thus preventing the gas from returning to the retort, yet leaving it free to pass from it. He invented the *governor*, by which a regular pressure is secured upon the mains, though the consumption varies. The regulators now sold to private individuals, and which, when well-constructed, answer very good purposes, are mere modifications of the governor first introduced by Clegg, and perfected by Crosley, who, associated with him, seems to have followed every one of his inventions, to improve and simplify them.

Is Charcoal Liable to Spontaneous Combustion?

Our readers will remember the brief article on this subject on page 134, when our views were requested as to the possibility of charcoal dust taking fire spontaneously, when exposed to moisture. Our opinion was in the negative, and opposed to some scientific men in Philadelphia, who had been consulted on the question.

The following is a very useful, practical and able communication relating to this subject:

MESSRS. EDITORS—It appears that Mr. Blackburn's conclusions (page 134) respecting the origin of the fire in the freight-house in Philadelphia were based upon the opinion of certain scientific men. Now it is a well-known fact to practical men that many of our scientific men are exceedingly ignorant upon some of the most common things in practical life. I will give one instance, and then proceed to my subject.

Some nine years ago, some of the French philosophers discovered that the finger or hand could be passed through a stream of liquid iron without being injured by the intense heat. This was a subject of much comment and discussion in scientific publications, both in this country and Europe; and while they were astonished at the wonderful discovery, it was a thing that had been perfectly familiar to workers in iron since the building of the iron gods spoken of by Daniel the prophet.

I have been perfectly familiar with pulverized charcoal and other coal, in connection with the foundry business, for over twenty years, and for the last two years have been extensively engaged in the manufacture of foundry facings, rectifying coal, &c. I work up nearly twenty thousand bushels of charcoal per annum into dusts of various grades, and these are at times subject to various degrees of dampness, from aqueous absorption from the atmosphere to perfect saturation with water, and in no instance have I ever been able to discover a sensible increase of heat. If there was a chemical affinity between charcoal and oxygen, the result would be the increase of temperature in the mass, and the liberation of hydrogen gas, neither of which takes place with any degree of moisture.

A few facts will set at rest this charcoal question. The ink of charcoal on the parchment taken from the catacombs of Egypt has been found not to have undergone any change; and the charcoal taken from Herculanæum and Pompeii is the same as coal burnt to-day; and it is a common practice to char fence posts to prevent oxydation, which is nothing but slow combustion. The rusting of metals, rotting of wood, and decomposition of organic matter are all cases where heat is generated; but charcoal may be exposed for any length of time without undergoing these changes, and it is well known to be one of the most indestructible materials in nature. Charcoal, Lehigh coal, plumbago, and the diamond are almost the same in chemical properties—all are nearly pure carbon, and all nearly equally unaffected by the action of the weather elements.

Now for the probable cause of the fire referred to in Philadelphia. Charcoal has a strong affinity for moisture, and not oxygen, at ordinary temperature. Pulverized merchant charcoal contains about 15 per cent of water, and with this amount of moisture will readily ignite a strong spark. I have known over twenty fires by charcoal dust, and have seen the facing ways used in foundries on fire a hundred times, and in all cases by scintillations thrown off by spilling the molten iron. I know one foundry that has been burnt four times by this means; and many foundries, for this reason, have given up grinding their coal. What makes this material most dangerous is, it takes fire very easily from a strong spark when fine and dry, but does not show itself for several hours, and sometimes days after. The only safe way of telling when it is on fire, in the early stages, is by feeling it with the hand. It may be full of fire and not perceptible to the eye. I have frequently set charcoal dust on fire by friction in grinding; and in one case it did not show itself until four and a-half days afterwards. The fire in the bags in the depot at Philadelphia may have been in them when they left the mill, or communicated by a spark from the engine, or from a cigar.

Charcoal is one of the best and cheapest non-conductors of heat known, and in my judgment may be used with safety with any amount of moisture, and with equal safety dry, when protected from sparks, and kept at a temperature a little below the melting point of lead. L. A. ORCUTT.

Albany, N. Y., February, 1858.

[In a recent number of Emery's *Journal of Agriculture* (Chicago), it quotes our opinion referred to above, and regards it "as having great weight;" at the same time, it gives the opinion of a practical man in reference to a mode heretofore unknown to us, whereby charcoal dust may be ignited. This gentleman stated that "charcoal long exposed to moisture, and suddenly dried or heated, would ignite. He had known well authenticated instances from such a cause; and of no article about his premises was he more careful than of the disposition of charcoal." This is a question of considerable importance to those who use fine charcoal dust; and we hope experiments may be made which will prove its liability to accidental combustion, or the reverse. It is important that the facts should be known.—EDS.

The Duke of Wellington and Railroads.

In the life of George Stephenson, the distinguished railroad engineer, it is stated that for a long long period of time the Duke of Wellington would not trust himself behind a locomotive. When the first passenger railroad in England was opened in 1828, Mr. Huskisson, M. P., was killed before his eyes, and this accident contributed to prejudice him against railways. It was fifteen years (1843) after that event before he mounted the iron rail, and this was on the Southwestern Railway, attending Queen Victoria. The hero of a hundred fights rather quailed before the snorting of the "iron horse."

Inspectors of Steamboats.

We regret to have occasion this week to direct the attention of steamboat inspectors specially, and the public generally, to another explosion, which occurred on the steamboat *Col. Crossman*, from New Orleans to St. Louis, on the 4th inst. She had on board two hundred passengers, twenty-five of whom are reported to have lost their lives. This steamer, like the one noticed in our last number, also took fire, and burned to the water's edge. If the inspectors have become careless in the performance of their duties, they should not be allowed to keep their places.

We have received the reports of the committees of the Massachusetts Horticultural Society for 1857.

Correspondents

☞ We are often annoyed by the receipt of letters, very properly done in all respects, with the exception that the Post-office address is omitted. We have two on hand now to which we are anxious to reply: one from James Graves, the other from Cloud & Hatfield. We are often censured for neglect which is wholly chargable to our correspondents, in the manner above indicated. Correspondents should not only write their names in a clear and unmistakable manner, but also give Post-office directions in full—town, county, and State.

G. T. and others, of Conn.—You ought to be aware that it would require a considerable amount of printing space, illustrated with engravings, to give you the desired information regarding the arrangement of parts in a beam engine, and the construction of eccentrics. You will find the desired information in "Hodge on the Steam Engine," or "Tredgold."

T. B. J., of Mass.—We are much obliged to you for the useful information you have forwarded to us.

E. T. Q., of Mass.—Your idea of allowing the warm air to circulate under the floor to warm the lower part of a building or apartment, is an excellent one, though not new. In the plan of warming and ventilating patented by H. Ruttan, 1848, the air is admitted to the upper part of the apartment, and after making its escape at the bottom, passes under the whole of the floor. By this plan not only is the floor warmed from below, but a downward circulation of the warm air is obtained, by which a uniformity of temperature in the upper and lower parts of a room is insured, and all the dust is confined to the floor.

J. C. S., of Ohio.—The oil of rhodium is made from rhodium wood by distillation, and is chiefly brought from the Levant.

J. R. B., of N. Y.—We do not know where you can obtain an illustrated work on old coins. In Addison's works there is an excellent illustrated treatise on old medals.

W. A. M., of Ohio.—There are a great number of patents on combined corn planters and cultivators. You are as liable, if you make a machine for your own use which infringes upon an existing patent, as if you made and sold it to another to be used.

J. P., of Mich.—Your remittance of $15 to pay for engraving your ore-washer, came safely to hand.

D. D. C., of N. Y.—If you have an order to build an improved machine, and furnish it to other parties, it does not prevent you from securing a valid patent for it afterwards. It must not, however, be publicly used for more than two years prior to the application.

L. P. S., of Conn.—The arrangement which you have made in the magneto-electric machine, by presenting the same poles of the magnet to the same ends of the helix, is not an improvement, but the reverse. Each pole of the magnet must be successively brought near to either end of the helix, to magnetize the soft iron of the armature with opposite polarity. This is the way we understand the action of the magneto-electric machine. You can easily try an experiment, and satisfy yourself.

W. S. R., of Ohio.—If you boil ground glass, or fine white sand, in a strong solution of caustic soda, you will obtain the soluble silicate of soda. You can make the caustic ley by adding fresh slacked lime—half and half—to the soda solution. Use the clear liquor for dissolving the glass.

J. A., of Ohio.—The pressure on a slide valve of the construction commonly used in the steam engine is as the whole area of the valve, if the face fits perfectly steam tight to its seat.

J. R., of N. Y.—The article on back-lash in grist mills, in our last number, contains all the information you desire.

C. A. C., of Pa.—Wire rope is not so strong as bar iron of the same diameter, but we do not know the exact difference. A good wire rope, four inches in diameter, and six feet long, has sustained a strain of 29 tuns. We do not know anything more about Cornwall & Brothers than that they paid for their advertisement.

S. P., of N. J.—Roman cement, clean sand, and some linseed oil boiled with coal tar to the proper consistency makes a very good cement for the roofs of outhouses. Its surface should be covered with sand or fine gravel. See an excellent article on cements on page 366, Vol 11, Sci. Am.

F. G. W., of Mass.—You ask, "Will the cohesiveness of iron be impaired in one direction by its being subjected to a separating force at right angles to that direction?" Certainly it will. It must rupture in *that* direction, and no other.

J. T. & Co., of Me.—India rubber buttons are manufactured exclusively by one company, under the Goodyear patent. We do not know the exact proportions of the materials employed in their composition, but shell lac, the carbonate of magnesia, and lamplack are mixed with the india-rubber.

J. A. B., of Minn.—Throw some potatoes or Indian corn meal into your boiler, which will stop the leaks in its seams. We have also seen horse manure used successfully for the same purpose. A good cement for iron joints is made with two ounces of sal ammoniac, one of sulphur, and sixteen of cast iron filings pounded in a mortar and made into a thick paste with water. It is packed into the seams of the boiler with a chisel or knife, and allowed to stand for two or three days until it dries. It ultimately becomes as hard as the metal itself.

F. T., of Minn.—We are unacquainted with any substance that will restore gray hair to its natural color. We advise you not to try anything for this purpose. Cultivate your health, do good continually, and snap your fingers at those who despise gray hairs. The nitrate of silver, 20 grains, dissolved in an ounce of soft water and a little ammonia, will dye white hair a dark brown color.

J. L. M., of Texas.—Your project of reclaiming the land now covered by the Gulf of Mexico is gigantic and splendid, but have you taken into account the immense capital required for building the wall before the waters can be pumped out? Here is the greatest and most difficult work. Instead of employing small 20-inch pumps, we would use pumps of 100-inch caliber.

J. W. of N. Y.—Saws have been "so set and filed" as to saw and plane at the same time.

C. D., of Ill.—Hail is not produced by the meeting of two clouds or currents of air, but rain is produced in this way, and frozen into hail by passing afterwards through a colder stratum of air. We do not think you can apply the same principles artificially to a meat safe. There are railroad cars now used for bringing carcases from the West to our city, which carcasses are cooled artificially by ice and evaporation.

C. L. P., of Va.—The arms of wooden axles for wagons are made very slightly conical in form, and with a strip of iron flush with the wood on the upper and under sides; this renders them stronger, and more durable. A carriage with low wheels can be drawn up a steep hill with greater ease than one with high wheels, because the relative gravity of the wagon is increased with the incline of the plane.

J. A. S., of N. Y.—Make the secondary coil of your helix one-fourth the length of your primary coil. Some have employed primary and secondary coils of the same length.

J. R., of Pa.—We do not think a patent has ever been granted for a quilting machine. Some of our ingenious inventors are, no doubt, capable of inventing such a machine.

C. C., of Pa.—We think there is sufficient encouragement to warrant an application for a patent on your bullet-molding machine. You had better not delay your application. We have seen the sad results of such delays so often in our experience that we cannot advise a postponement.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, February 13, 1858:—

J. M., of R. I., $25; J. G. B., of N. J., $25; D. H., of Ky., $30; S. & W., of Wis., $30; E. B. W., of N. H., $50; T. A. D., of N. Y., $25; A. H. G., of Ind., $30; J. J., of S. C., $30; B. Y., of N. Y., $55; W. A. S., of Mass., $30; G. T., of N. Y., $55; H. B., of N. Y., $95; A. & Bro's., of Conn., $30; E. S., of La., $50; L. J., of Mass., $25; J. R., of N. Y., $10; J. H., of N. Y., $30; D. O. DeW., of N. Y., $30; G. H., of R. I., $30; J. McI., of N. Y., $30; A. M., of N. Y., $30; H. M., of N. Y., $90; R. P., of L. I., $30; J. L. R., of S. C., $30; W. Y. G., of Ky., $30; F. S. S., of Conn., $25; H. G. B., of Mich., $30; W. & I. D., of Conn., $30; C. W. H., of Mass., $30; A. S., of N. Y., $20; S. C., of N. Y., $30; G. L. D., of N. Y., 32; J. L. R., of N. Y., $27.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, February 13, 1858:—

A. S., of N. Y.; J. P. M., of R. I.; J. J., of S. C.; L. J., of Mass.; K. & Bro's., of Mass.; S. C., of N. Y.; J. G. B., of N. J.; E. S. S., of Conn.; E. R. B., of Conn.; G. L. D., of N. Y.; J. L. R., of N. Y.

Literary Notices.

A Dictionary of Medical Science.—By Robley Dunglison, M. D., L. L. D. Blanchard & Lea, Philadelphia.—A new edition of this valuable book has just appeared, having about six thousand new subjects and terms added, and the whole has been carefully revised. This is one of the most gigantic works that was ever produced by a single individual, and under each medical word or term will be found exactly the information the medical man or technologist requires. It is a most valuable contribution to the number of lexicons at present extant.

Imperial Cyclopædia of Machinery—Parts 11 and 12 of this truly imperial production have just been issued by C. B. Russell & Bros., Tremont street, Boston. They contain excellent drawings of one of Stephenson's express locomotives; warping machinery for factories; screw propellers, and their engines. This publication is got up in a superior manner.

Muspratt's Chemistry—Parts 33 and 34 of this admirable work have just been published by C. B. Russell & Bros., of Boston. They contain a full treatise on the manufacture of glass in all its branches. It is got up in excellent style, and deserves an extensive patronage.

We have received the Atlantic Monthly for February, containing several interesting articles by distinguished authors.

TO OUR SUBSCRIBERS.

Receipts—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of the receipt of their funds. The Post Office law does not allow publishers to enclose receipts in the paper.

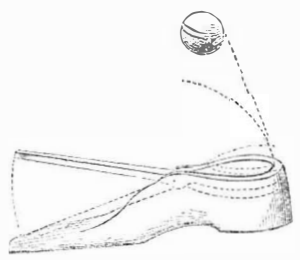
Back Numbers.—After the 1st of January, we shall commence sending the Scientific American to new subscribers from the time their names are received, unless the person ordering expresses a desire to receive the back numbers, in which case complete sets will be furnished from the commencement of the volume.

TERMS OF ADVERTISING.

Twenty-five cents per line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

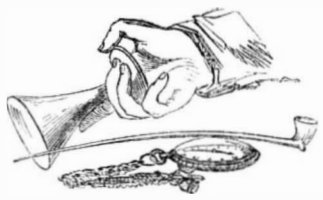
*** All advertisements must be paid for before inserting.

A common way of playing trap and ball is to have a shoe of wood, and a spoon in the heel, with a long end hinged to the shoe by a bit of wire. The ball is placed on the spoon end, and the long end smartly struck, when the ball is thrown out in the direction shown by the dotted line, and it can again be conveniently struck by the bat. The dotted lines in the illustration show the alteration of position which takes place when the ball is discharged from the shoe. "But," it may be said, "the spoon which moves the ball moves in a segment of a circle, and, of course, the ball will continue in the same path; how, then, can it be made to fly up?" It must be noticed that the spoon can only ascend a cer-



tain distance, because its passage is arrested by the long end meeting the shoe, and the ball, having motion imparted to it, flies off in a right line from the moment in which its motor stopped. The same is, perhaps, better illustrated in the sling. A bit of leather and two strings, having a stone held in the leather, is whirled rapidly round by the hand, and one string being suddenly let go, the stone flies off in a straight line, or in other words, at a tangent with the circle it has been describing. Playing ball is good healthy sport for this cold weather, and helps to make ruddy cheeks and warm hands.

The dry frosty days are just the time of year when it is most easy to be successful with electrical experiments; and a very simple one we give our readers to perform, as illustrative of electrical attraction. Lay a



watch down on the table, and on the glass balance a tobacco pipe very carefully. Next take a wine glass, rub it quickly with a silk handkerchief, and hold it for half a minute before the fire, then apply it to the rear end of the pipe, and the latter, attracted by the electricity excited by the friction and warmth of the handkerchief and glass, will immediately follow it; and by carrying the wine glass around, always in front of the pipe, the latter will continue its rotary motion, the watch glass being the center on which it rotates.

New Self-Lighting Lantern.

The trouble and annoyance that is often experienced by persons trying to light a lantern in the open air, say on some windy night, is by this invention entirely obviated. Oftentimes it is desirable to obtain a light quickly, just as a person would want to fire a pistol immediately, and not have to wait to load and cap it at the moment its aid was needed; so with an ordinary lantern, it must either be carried lighted or lighted when wanted, which is a process that in the house occupies some time, and much longer out of doors.

The lantern which is the subject of our illustration can be prepared at any time, and by merely touching a trigger with the thumb the lantern is lighted. It is applicable for the open air or the sick chamber, and its construction we will now describe.

A is the lantern containing the lamp, B. A′ is the door to which the lighting mechanism is attached, and C is the handle. The match, D, is placed in a socket, E, provided with a spring, F, which holds it firmly in its place. This socket is attached to the bent rod, H, confined in the wire loop, G, and terminating in the spring, I, fastened to the door, A′. Fig. 2 shows the operating parts, which are connected with the door. A bar, J, is held up by the spring, K, pressing against a cap on its upper end and on the handle, and this bar is hinged at *l* to a catch, L, projecting through the door, and hinged to a bar, M, that is also hinged to the door at *m*. N is a curved plate, either corrugated or carrying a piece of sandpaper.

The operation is as follows:—The match is placed in the socket, E, and pulled back over the catch, L, which keeps it flat against the

RICHARD'S SELF-LIGHTING LANTERN.

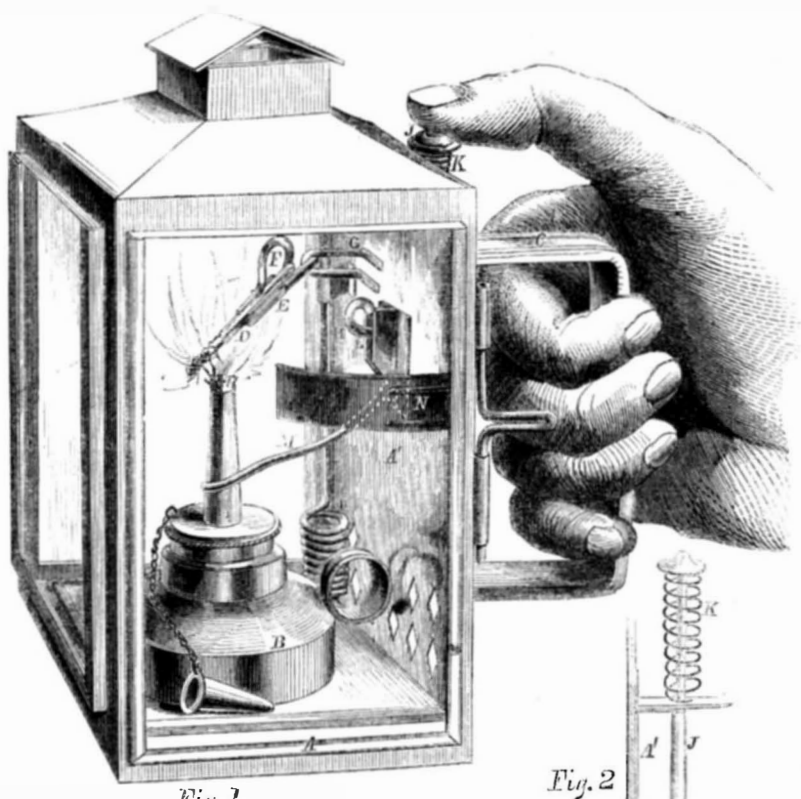


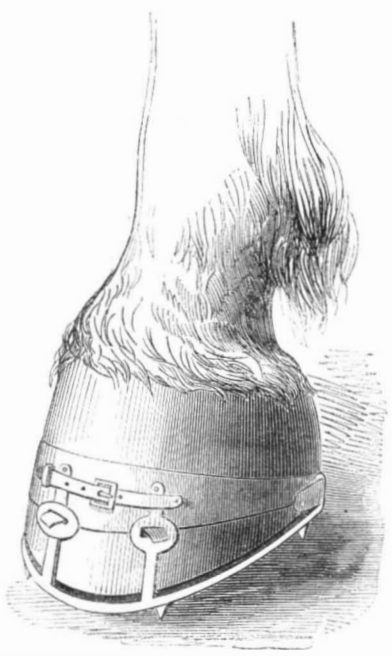
Fig. 1

Fig. 2

door until a light is wished, when the thumb is pressed on the cap on J, and L being depressed allows the spring to pull back E, and drag the match quickly against the plate, N, which ignites it, at the same time the hooked bar, M, ascends, and its hooked end throws off the extinguisher which ordinarily covers the wick. The match then burns over the wick and ignites it, and at the same time consumes that portion of the match which would interfere with the light, so that it drops off and leaves the light free to burn.

It is a good lantern, and was patented Jan. 5, 1858, by the inventor, Albert C. Richards, of Newtown, Conn., who will furnish any further particulars. It was noticed on page 147 of the present volume of the Scientific American.

The Crampon.



In winter, when the streets are slippery in the extreme, and horses are continually endangering the lives of those whom they are drawing or carrying, by falling down on the slippery stones, it is a common practice in England to *rough* the horse's shoes, that is, to raise a number of serrations on the bottom of the shoe by a chisel or file; this, of course, quickly wears them out. In this country, where the same accident is just as liable to occur from the falling of horses on the hard snow, their shoes are *calked*, that is, steel spikes are worked on them, which take hold in the snow, and prevent slipping. This does some slight injury to the horse's hoof. We now call attention to a combination of the calk with an elastic shoe, which has been invented by M. Anelli, of London, Eng., who calls it a "Crampon." The form and adjustment of it will be seen by the accompanying engraving.

It can easily be taken off or on, and goes over the ordinary shoe. It has been tried on ice with heavy loads, and the horses had a good, steady hold; the wear is very slight. The veterinary surgeons to the Queen of England, the Horse Guards, and the riding-master of the royal family, greatly approve of it, as does also the Veterinary College of Britain. Although there does not seem to be much necessity for such contrivances here, this winter, it is well to know of such things when they are required.

L'Inventore, published at Turin, in Piedmont, announces that the patent laws of that country are undergoing a liberal supervision by the government.

Transmission of Fevers.

In a work recently published by an English physician on the transmission of fevers, after referring to the value of thorough ventilation, light, and cleanliness, to disinfect clothes and apartments, he says:—"It is important to know, regarding infection, that when not destroyed or dispersed in the sick-room, it attaches itself and adheres with great tenacity to all articles of furniture, chairs, tables, drawers, &c., nestling in their innumerable pores; and unless these articles be scrubbed with a solution of chloride of lime, or exposed to a strong heat, or a free current of air for several hours, it may again become evolved, more virulently than at first, after a lapse of weeks. But it chiefly adheres to cotton and woolen materials. The patient's body-clothes and blankets become saturated with it, like a sponge with water; in airing these materials, a mere passing breeze is not always sufficient to carry it away."—*Exchange.*

[There is little doubt that infectious diseases are carried by things and in ways we little dream of; but whether infection adheres so closely to articles as the above paragraph would intimate, is a question. We would however, advise any of our readers who should unhappily have occasion to want the advice, to boil a little nitric acid in the sick room, (first removing therefrom all metallic articles,) as this is the most powerful and perfect disinfectant.—Eds.