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 NEW YORK, JUNE 29, 1867.


Improvement in Sawing wood.
The buck and saw are undoubtedly useful implements for preparing fuel from wood, but it may be questioned whether they are favorite instruments for the development of muscle, even for those who are devoted to gymnastic exercises. The machine represented in the annexed engraving is in tended to take the place of the ordinary buck saw, and may be operated either by hand or by steam or horse power, one or both saws being run. Its general construction is easily understood, the machine being a frame mounting machine being a frame mounting a driving wheel with cranks, a balance wheel, and the saws with the necessary connections. The power is applied to the center band wheel, which, by means of a belt, drives the crank shaft, with pulley and fly wheel, at one end of the frame. From the cranks on each end of this shaft connect ing rods are attached to bars, the forward ends of which traverse between upper and under rollers, seen at $A$, and the other ends between guides, B. These sliding bars, with the rollers, guides, and the saws are all attached to the side pieces, C, which are pivoted at $D$, near the crank shaft, and the other ends of which can be raised or lowered, directed by the curved guides, E, which are bolted to the frame of the machine. This arrangement allows the saws to pass down through the log or bundle of sticks as they progress, while the relative positions of cranks, connections, and slides are unaltered.
The rear end of the frame is inclined from the top outward and furnished with two braces, F, inclined in the opposite direction to form a receptacle for the wood to be sawed. The inclined supports of the frame are furnished with

Now York and Boston made a trial trip on the 11 th|ing whelent of June, carrying over twelve hundred guests. The hull | or feather on the other half. This arrangement tends to hold |
| :--- | :--- | :--- | :--- | was built by Wm. H. Webb, and the machinery and boilers the shade fast without tacking or other security. The ends by John Roach \& Son, Atna Iron Works, from designs by of the split roller are secured by a button or disk, either Erastus W. Smith, A. P. D. The vessel has a capacity of screwed on or held in place by friction, both of the disks hav3,000 tuns and the cylinder of the engine measures 110 inch- ing studs which fit into the end brackets, forming axes for the



THE RICHMOND SAWING MACHINE. spurs to secure the wood, and th
log or pile is held securely by the jack, G, having teeth on She is the largest steamer ever built for the Sound traf- $\dagger$ roller, and one of them being a grooved pulley for the its inner edge and operated by the lever, $H$, and the fic. In our next we shall give a description of the vessel and hold-fast, I. When the receptacle is to be loaded the her machinery. saws with their appurtenances are raised by depressing the handle, $J$, which may be locked in position by catch, K . The wood, being placed in position, is confined securely by the lever, $H$, and the jack, $G$, when the handle, J, is released, allowing the saw to come in contact with the wood. Nothing more is ne. cessary then than to give motion to the saws by the crank handles, while the weight of the pivoted side piece, C, with its appurtepiece, C, with its appurtenances, carries the saws through, its progress being stopped, when the saw has passed through, by the block on the bottom of the segmental guide, E. One side of the machine is a counterpart of the other, and one or both saws may be used at the same time.
It is claimed that this machine, although light, portable, and cheap, will, by the power of one man do four times the work in wood sawing in a given time than can be done by the buck and saw. It is especially suited to huuseholders, farmers, and persons engaged in furnishing elegance cannot be combined with usefulness without draw wood fuel for the market, as it may be used at the house, shop, ing too heavily on purses already tested to their full extent. or in the woods. It is the subject of a patent granted to $F$ J. Richmond through the Scientific American Patent Agency in 1864. Rights and machines for sale at the office and manufactory Nos. 56, 58, 60 and 62 West 13 th street, New York. All communications addressed to Phyfe, Richmond \& Co., as above, will receive attention.

Trial Trip of the Bristol.-This immense steamer which with her consort, the Providence, is intended for the new line One of these longitudinal sections has a central recess run-

Improvement in Attaching Window Shades.
As the inventor truly remarks, the exhibition of a bare roller of a curtain or shade detracts from the completeness of a sitting room or parlor, and there is no adequate reason why


BROWN'S IMPROVED SHADE FIXTURES
with usefulness and convenience without heavy cost. It is easily described.
Fig. 1 shows the upper portion of a window with the fix tures and shades. The roller to which the shade is attache is concealed by a sheath, and differs from the ordinary rolle only in being in two pieces, really a roller split longitudinally for the reception of the cloth of which the shade is composed
One of these longitudinal sections has a central
roller, and one of them being a grooved pulley for the cord One of the supporting end brackets holds a spiral spring the tension of which retains the shade at any hight. The whole roller is covered with a double sheath of ornamental wood or metal, slotted to allow the fabric of the shade to pass through, and the ends at the center of the roller are supported by an ornamental suspended bracket enveloping the sheath, which is slotted on the under side to correspond with the slots in the sheath itself. All the exposed parts of this fixture are ornamented by carving if of wood, or by graceful designs if cast or stamped of metal. Fig. 2 is the lower cord pulley with its appurtenances. It has a tapering screw by which it may be seated at a convenient point in the window casing, and the pulley may be elevated or depressed in the slotted portion and held by the thumb nut.
The whole makes an elegant and sightly contrivance for the sitting room or parlor, and the sheath,when the shade is wound up, preserves it from sun and dust. Its cost is not great, slightly above the common plain fixtures, while it pleases the eye and yet performs its office. Patent pending on this device through the Scientific American Patent Asency, by Wm. Brown, West Cambridge, Mass., who
will furnish any further information desired.
The Livingstone Search Boat.-An exploring expedition is about to be dispatched by the British Government under command of Mr. Young of the royal yacht, and a portable sectional iron boat is building from designs by Chief Constructor Reed, of the navy. The sections will be two feet in length and not over 40 pounds weight, to be carried overland between the navigable lakes and water courses. The plates are one-sixteenth of an inch thick. The disputed question of Dr. Divingstone fate will at least be cleared up,

## Special correspondence of the Sclentific American. LOCOMOTIVES IN THE EXPOSITION.

 Parts, May 16, $186 \%$. FOUR CXLINDER LOCOMOTIVEOne of the most remarkable locomotives in the Exhibition is a twelve wheel coupled tank engine by Messrs. E. Gouin \& Co. constructed for the Chemin de Fer du Nord. There are four cylinders of $17 \frac{1}{3}$ inches diameter $17 \frac{1}{8}$ inches stroke, two at the forward and two at the back end of the engine each driving three pairs of wheels. the connecting rods taking hold of the middle pair. The diameter of the wheels is 3 feet 6 inches and the length of the wheel base is 19 feet 9 inches. To facilitate the passage of the engine around curves, two thirds of an inch end play is allowed in the bearings of the extreme axles and the coupling rods are provided with a joint near the central crank pin admitting of a slight horizontal movement of the extreme axle instead of one adopted to vertical motion, as usually employed. Thecylinders, which are horizontal, are placed outside and have large flanges cast on them by means of which they are bolted to the frames. The two opposite frames are connected at the same point by transverse plates, which makes a stiff support for the cylinders. The steam chests are placed on top of the cylinders so that the valves are quite accessible, and this is rendered possible by the use of an outside valve gear, instead of by the use of a rock shaft as with us. The ordinary link motion is employed. The wheels are connected by compensating levers and the weight is very equally distributed on each pair, the total weight in working order being about 59 tuns. The center of the boiler is 7 feet 2 inches above the rails, and the firebox is made so shallow as to clear the tops of the wheels and is of such a width as to extend over them. This gives the large area of 33 square feet to the grates which permits the use of coal slack as fuel. Above the barrel of the boiler is placed a dryer or superheater of tubular construction, arranged as a return flue for the gases. The chimney is carried horizontally back from this to the back end of the boiler (the superheat er not extending the full length of the latter) and then turns
up just so as to give a vertical direction to the smoke and cinup just so as to give a vertical direction to the smoke and cin-
ders. There are 275 tubes of $2 \frac{3}{6}$ inches diameter in the boiler giving 1200 square feet of tube heating surface which with 107 square feet in the fire box and 414 square feet in the dryer and a feed water heater gives 1721 square feet for the total surface. The base of the chimney being near the center of the length of the boiler the exhaust steam has a long distance to travel before reaching the blast pipe. There are a number of these engines at work on the Chemin de Fer du Nord, and they of course haul very heavy trains, but I believe they are not very steady on the rails and it is doubtful if an
will be built. The pressure of steam used is 118 lbs .
another remarkable engine.
Standing close by this is one for the Paris and Orleans railway, built at the company's shops at Ivory. It has ten coupled wheels of 3 feet 6 inches diameter, and a pair of outside cylinders of about 19 星 diameter by 24 inches stroke. The surface by which the cylinder is bolted to the frame plates appears ample, the latter being stiffened as in the previonsly mentioned engine. The most noticeable feature about this engine is that the two after axles are furnished with outside bearings, for the purpose I presume, of removing the axle boxes further from the fire box, and as the bearings are maintained of an ample width on these as on the other axles, and as of course an outside crank must be employed to receive the coupling rods, an extremely long crank pin is required in the driving wheel which is the center one of the five. This pin has three journals, the outer one of course being used for the coupling rod for the after pair of wheels with outside bearings, and the inner one is used for the coupling rod for the forward pair, the connecting rod taking hold of the middle bearing. Of course the strain of the after pair of wheels applied at such a distance from the wheel must be very severe on the crank pin. Still outside of this is an overhung crank for the eccentrics of the link motion, which is of the stationary link kind. The boiler is flush for its entire length and is covcred entirely with sheet hrass as are also the cylinders. In. stead however, of this being done with taste as in our engines, it is full of corners and sharp depressions, as usual over here to adapt itself to the form of the casting, the consequence being that it can never be kept clean and will always look bad ly on that account. The use of the outside link motion ena-
bles the steam chest to be placed above the cylinder, the latter being horizontal and the former inclined. The piston rods work through stuffing boxes in the front head to sustain the weight of the pistons. A long tank extends on each side of the engine just over the wheels from the cylinders to the back of the foot plate except at a short distance from the front where a continuity is broken to allow access to the axles boxes of the forward wheels for oiling. This engine is intended for working an incline of 1 in 29.

ADJUSTMENT OF COUNTERWEIGHTS.
An engine with a steam tender, constructed at Graffenstadn for the Chemin de Fer del' Est, is also worthy of notice. The engine has six coupled wheels of 4 feet 8 inches diame ter, and the tender also six of a less diameter. The bearings are outside, of good width and the connection is therefore effected by means of overhung cranks, which, by the way, look very heavy for the size of the coupling rods employed, especally those on the axles of the tender. The cylinders for both the tender and engine are placed inside and inclined and appear to be well fastened to the frames. The diameter of the main pair of cylinders is $16 \frac{1}{2}$ inches and the stroke 2 feet. The wheel base of the engine is 12 feet 2 inches and the weight 36 tuns in working order, that of the tender with 1,760 gallons of water, being $26 \frac{1}{2}$ tuns. The counterweights on
the driving wheels of this engine are arranged in a manner
that shows an intelligent comprehension of the action of the moving parts. In an inside cylinder engine the center lines of the engines being situated at a considerable distance from the planes of the driving wheels it is evident that a weight the planes of the driving wheels it is evident that a weight
situated in either of the latter, cannot counterbalance by mosituated in either of the latter, cannot counterbalance by mo
mentum an opposite force acting in the direction of one of mentum an pposite force acting in the direction of one of
the former, as the tendency of two such forces would be to the former, as the tendency of two such forces would be to
produce rotation around a point midway between them. By dividing the counterweight for each engine however, and placing one portion in one wheel and the othar in the one situated on the opposite side of the center line, a perfect com pensation may be effected. The weights must of course be divided in the inverse proportion of the distance of each wheel from the center line of the engine whose parts we wish to balance. The cranks of the two engines being situated at right angles to each other, we shall have in each wheel two counterweights of unequal size, the larger placed opposite to the crank of the nearer engine and the other at opposite to the crank of the nearer engine and the other at
right angles to this, or opposite the crank of the further enright angles to this, or opposite the crank of the further en-
gine. These two weights may of course be replaced by one occupying a position between the two, determined ly the rel ative magnitude of the original weights, by the ordinary method of the parallelogram of forces, the size of the single weight being fixed in the same manner. It will be seen that the position given to the weights in an inside cylinder en gine 'will be considerably removed from directly opposite the cranks, and therefore an engine having the counterweights placed in the latter position as is generally the case, can not be properly counterbalanced. The same considerations apply to outside cylinder engines, but as in these the plane of th wheel is very close to that of the center line of the engine the counterbalance of each engine may be almost perfectly effected by a weight in the nearer wheel

## REVERSING SCREW.

The two engines last mentioned are furnished with a screw or reversing, instead of the ordinary reversing lever. This arrangement, first introduced about 4 years ago by Ramsbot tom, I believe is now very generally adopted, and I observe that most of the engines exhibited by Continental makers are provided with it. A projecting handle is in some cases ap plied to the hand wheel at the end of the screw, so that th wheel may be rapidly revolved in reversing. To enable the engine to be reversed in an emergency more quickly than is possible with the screw alone, the lever and screw are in some cases combined, and there are quite a number of en gear varying in the details of its construction. In some, the catch of the ordinary lever is made to drop into the threads of the screw instead of into the notches on an arc, and for this purpose the screw is either made of a curved outline large in the middle and small at the ends so that its upper surface shall correspond with the arc in which the leve moves ; or the screw is fixed but at one end, and is free to vi brate as the lever moves so as to accommodate itself toits po sition. In others again, a divided nut is employed which is thrown out of gear by the same means that the catch is lift ed when the lever alone is used; and this is arranged to slide up or down in a groove in the lever as the latter vi brates. The latter is the form used on the express engine exhibited by the Paris and Orleans Railway with a few re marks on which I will conclude this letter. It has 4 coupled wheels 6 feet 7 inches diameter, and a single pair of leading wheels 4 feet 1 inch in diameter. The cylinders and firebox as in so many engines, overhang the wheels, the total whee base being 13 feet 2 inches. The two driving axle boxes on each side are connected by a stiff equalizing beam, and a sin gle-spring, placed at the center of its length transmits the weight of the engine to the wheels. The cylinders are out side and of 17 inches diameter by $25 \frac{1}{2}$ inches stroke.

Slade.

## The Electric Light.

The British Joornal of Photography thus describes the new ectric machine of Professor Wheatstone :-
Our ideas of the electric light are almost invariably associ ated with the recollections of trouble and difficulty often ex perienced in the management of a large galvanic battery with its accompanying fittings, acids, and fumes, detrimenta alike to the clothes, hands, and olfactory organs of the operator. How different it would be if, instead of the cumberou paraphernalia wo had but to turn a wheel, and lo! our sun would send forth his brilliant beams! This is not now a mat ter of
pii.

In the new machine no magnetism, no electricity, is required to commence the action. Nothing but motion is needed to convert a mass of iron and covered wire into a magazine of
intense electric power. The new machine consists essentially of a bar of iron bent
in horseshoe fashion; around this is coiled covered wire, as in in horseshoe fashion; around this is coiled covered wire, as in an ordinary electro-magnet. Between the poles revolves a
spindle carrying covered wire, insulated, but so arranged that either end will be alternately brought into contact with each terminal of the wire surrounding the iron bar. Again: the spindle is so placed that, during its revolution on its long aris, it iz made to present each side in succession to either limb of the horseshoe. The spindle is driven by an endless band which passes around the circumference of a tolerably large flywheel. This is the general construction. When the spin dle is rapidly revolved the horseshoe becomes magnetized, a powerful electric current being induced in the wire helix at the same time; and as the motion is continued, the forces go
on acting and reacting until a very high degree of intensity is obtained. The electricity can be taken between two ter minals placed in proper position. In this rempect an important
point of difference exists between Mr. Wilde's machine and Professor Wheatstone's inasmuch as in the former any body which we wish to submit to the action of the electric current must form the terminals of the complete circuit, whereas in the new apparatus the substance to be operated upon forms bidge or short cut for the electricity, in order to complete the ircuit.
The power of this apparatus is so great that, even when of mall size and easily turned by the hand, it is capable of burning a piece of iron wire thirty inches long and one-six teenth or more in diameter. In this experiment, at the mo ment of separation of the fused and glowing iron, the meta scintillates in a very beautiful manner. The same result i also obtained by approaching one terminal, consisting of iron wire, to the second end; the iron immediately takes fire and burns with brilliant coruscations. When the current is made to pass between charcoal points a beautiful and steady light can be obtained. This is the point which chiefly interests us, and we have little doubt that before long we shall have a ma hine which will be practicably available, and enable us to alize the idea conveyed in the term "turning on the sun henever we need additional light.
Finally, we have in the new machine a remartable illustra tion of the co-relation of the forces-the muscular power of the human arm being ultimately converted into a brillian light, as exhibited by the following chain :-
Muscular power
Motion
Magnetism $\quad$ Electricity
$\square$
Chemical action

## An Electrica: Automaton

There is one giant toy in the center of one of the avenue of the exposition, which as it cannot be classified or included with any other apparatus, may as well be described here. It a large piece of imitation rock work, about twelve feet high covered with rich vegetation, ferns and mosses, lichens and rchids; a spring gushes forth from one side, and feeds the ond in which it is placed, and in which gold and silver fish litter and gambol. Peeping out of one of the cavernou penings at the bottom is a huge black and white Newfound and dog of nature's size and nature's mold, but not of nature' ife and blood. The attendant touches a secret spring, and while the admiring observer stays and stares, and feels in lined to pat Pompey's head, Pompey rolls his eyes, opens his mouth, and makes a very good imitation of the deep-mouthed welcome of some watch-dog's honest bark. Startled, but no intimidated, the observer raises his eyes and discovers careles y sitting on a huge boulder, a hare, which immediately plays a wild tattoo on a drum placed before it, and, ere pussy ceases, hideous and enormous baboon on one side clatters his jaws, olls his eyes, scratches his head, and plays a wild and savag ir upon a fiddle, while on the other side of the rock some pastoral swain, decked in gorgeous ribbons,
'Recubans sub tegmine fagi,"
bows his head, carefully peeps all around, raises a pipe, and brings forth strains that would melt Coryllis, who sits not fa off, had she only life, and who probably, with other figures sattered about the rock. will continue to attract crowds of excited and amused observers of this strange medley of elec tric agency and skill, during the continuance of the Exhibi tion.-Engineering.

## Meterology for May.

Prof. Loomis of Yale College, in his meterological repor for the past month, after giving the mean temperature at New Haven as but one degree below the average, the amount of rain as one inch greater than the average, speaks of the un usual preponderance of cloudy weather, the average for the entire month showing that at $1, \mathrm{P}$. M. three-fourths of the ky was covered with clouds.
The lateness of the season in that locality, as indicated by the flowering of fruit trees has been very remarkable. Peach rees blosomed ten days and apple trees fifteen days later than usual. During a period of eighty-eight years only three othe ases have occurred in which the flowering of apple trees wa equally late. These facts seem to indicate that the time of lossoming of fruit trees depends not simply upon the amount of heat, but also upon the amount of sunshine.
In Europe we are informed the month of May was uncom monly warm, thus conforming to a rule which has been fre quently observed in former years, viz., that the irregular fluc uations of temperature on the two sides of the Atlantic ar in opposite directions.

Another Steel Process.-Mr. John Calvert, an Englis engineer, patents a mode of converting iron to steel, the chie peculiarity of which is the minute subdivision of the materi al by saws or other mechanical means while hot ; allowing the particles to fall upon the hearth of a furnace in the pres nce of an excess of air and other gases such as may be ap propriate for the purification of the particular iron unde reatment. It is also to be magnetized by electricity or by friction from agitation : this being supposed requisite for pro ducing the proper molecular structure and strength.
A NOMBER of Californians are organizing a company with $\$ 500,000$ capital to buy up good lands to sell again to actua settlers, at long credits and low interest, together with seed farm implements and live stock; manufacturers will also bo encouraged.

## (ellitorial summary

Mr. James Parker, a gentleman residing near London, has lately introduced a system of working engines by mixed steam and air, which he applied to the propulsion of a small road locomotive some time ago, and more recently for propelling a small vessel on the Thames. The results of these experiments were very satisfactory, and the subject has recently attracted no little attention.-Exchange.
[The above is a Yankee invention, quite old. It is the Cloud engine, invented by Wm. Mount Storms, and was publicly exhibited at the Crystal Palace, in this city and other places, ten or twelve years ago
American Guns.-One of Captain Ericsson's communications to the Government of his native country on naval improvements has been made public in Europe, and is highly instructive as to the merits of different systems of heavy gun making. The trial of the 20 -inch guns at Fort Hamilton in March last, furnishes him with data for comparing the performance of these guns with the best English wrought iron rifled cannon. By the trials at Shoeburyness, the initial velocity of the 511 -lbs. rifled shot from the $13 \frac{1}{2}$ inch Armstrong gun being 1,250 feet in a second, its actual force is computed equal to $12 \frac{1}{2}$ millions of foot pounds ; since a body moving at a velocity of 1,250 feet per second has the force acquired by a body falling in vacuo 24,414 feet, or 24,414 times enough to raise its own weight one foot. On the other hand, the force of the 20 -inch, 1080 lbs. shot, with the proved initial velocity of 1,400 feet, is computed by the same rule at $32 \frac{1}{2}$ millions of pounds. The area of the English elongated shot exposed to direct atmcspheric resistance is 143 square inches, and
that of the American spherical shot is 314 inches; considerthat of the American spherical shot is 314 inches; considerably less difference against the American shot than the com puted force shows in its favor, without charging to the Ensides. The worst of it is that this, by far their most powerful gun, has not yet been made reliable.

Eiectro-casting.-Statues and other fine models in metal are made with microscopical exactitude in the fine-art foundery of Messrs. Elbington at Birmingham, by electro-casting i. e., precipitating the metal from a state of solution upon the surface of the mold by electrical decomposition of its salts. In order to do this, the mold itself is first produced by the same process. The object to be copied is made impervious 10 moisture, and then coated with fine black lead. Placed in a copper solution, it is electrically coated with the metal to a sufficient thickness to retain its form when removed, and is then divided and taken off, or the model is removed from within. Its interior is, of course, a surface negatively iden tical with that of the model, and on being filled with a solution of bronze, and submitted to the battery, receives a deposit of bronze, the form of which is not to be distinguished from the original by the finest scrutiny. These casting are usually made one-fourth of an inch thick, but the thickness can be varied at will, requiring weeks or months, according to the thickness. Unlike other modes of casting, in this there is no imperfection from the distortion either of the mold or of the casting, nor from imperfect filling of the finest lines of the mold,
Power of Invention.-The last two great wars have il lustrated in a new light the fact that one thought is mightier than a million arms. The inventor and the engineer fight the battles as well as do the work of the world. If there are exceptions and limitations to this statement at present, they are rapidly giving way before the advance of science, and the time is coming when they will be no more. We have only to suppose the inventor of the needle-gun to have been an Austrian or a "confederate" to perceive how the condition and future of either hemisphere might have been reversed through the agency of one man. Had the monitor sprung full-armed from a Southern instead of a Northern brain, where now would have been the United States? But there were reasons for these things as they were. Both Austria and the old South were narrow and non-progressive systems which could not breed invention, and would not honor the industrial arts. The future policy of nations is too plain to be missed by a plain man, however theorists may obscure it.
Only those who most successfully cherish, most determinedly grasp, the whole system of arts and manufactures, will here after be strong or secure.
Paper Boats.-In an article last week on the applications of paper, we might have added, among its other uses, its substitution for leather, as machinery belting, a patent for which has just been granted, and its peculiar adaptability for the manufacture of shell boats for racing. A boat maker of Troy has lately constructed one thirty feet long, which boats made of wood. It is thin, lighter than a wooden boat, is rendered impervious to water by a coating of oil and other compounds, and is claimed to be more durable, and that it will stand shocks that would destroy a wooden shell. Such a boat cannot be split or broken, but if a hole be made in it
by accident, the perforation will be no larger than the size of the object piercing it, and could be easily mended ; it will not swell nor crack, requires no caulking or pitching, and, above all, the cost is much less than a wooden boat.

Mercurial Vapors.-M. Boussingault has laid before the French Academy of Sciences his researches into the effects and counteractions of the vapors of mercury, which destroy or reduce to imbecility and misery so many lives in certain branches of manufactures. The deadly influence of these vapors on plants, and the effect of sulphur in neutralizing
them, had been carefully defined. Regnault considers the best reagent against the vapors of mercury to be an iodized daguerreotype plate, but Boussingault maintains that the
sensibility of the plates is as nothing compared with that of sensibility
plants.
Profits of Beet Sugar.-Mr. Grant's work on the beet sugar manufacture gives the following estimates of business on a capital of $\$ 200,000$ in buildings and machinery, and $\$ 100,000$ cash :-

##  <br>  $\begin{array}{r}\text { } 852,800 \\ -858,300 \\ \hline\end{array}$

Miscellaneous.-The importation of opium into the United States increased in twenty years, 1840 to 1860 , from 24,000 lbs., or a pound for every 750 persons, to 110,500 lbs. or a pound for every 285 persons ; the whote increase, at least an unmixed evil.-Mr. Ridgway, the zoologist appointed to accompany the Government exploration of Russian America, has arrived in California. When on that coast before, he found birds nearly identical with living species in Asia, none of which are found on the eastern coast of America.-A committee of the English Pariament reports that at least one third of all the fires in London are intentionally lighted for the purpose of defrauding insurance companies; mostly by "gangs of foreigners" who follow this as a business.-The Colonist, the oldest and most widely circulated journal in Van couver Island and British Columbia, says that " nine out of every ten men in the Colony would welcome annexation to
the United States." No Vancouver Island journal denies this. the United States." No Vancouver Island journal denies this.
-Germany has cooperative societies numbering 350,000 members, with yearly returns of large profits.-A number of Californians are organizing a company with $\$ 500,000$ capital to buy and sell good lands to actual settlers at long credits, and low interest, together with seed, farm implements and live stock. Manufactures will also be encouraged. -The progress of France in fourteen years past ( 1851 to 1865), is inlus trated by the increase of annual imports from $\$ 207,860,000$ to
$\$ 670,320,000$, while the exports increased from $\$ 298,800,000$ to $\$ 776,530,000$, and the total commerce was nearly tripled ; the clearances of shipping increased 50 per cent, the miles of railclearances of shipping increased 80 per cent, the miles of rail-
way were quadrupled $(2,187$ to 8,750$)$, the miles of telegraph way were quadrupled ( 2,187 to 8,750 ), the miles of telegraph
went from 1,875 up to 19,688 , and the business of the Post went from 1,875 up to 19,688, and the business of the Post
Office and the bank of France were each multiplied more than five times.-Arbitration Boards between employers and workmen have been formed in the hosiery trades of Derby Leicester and Nottingham, and are contemplated in the lace trade,-The Great Eastern has been seized under four war rants in as many actions, or claims for towing, supplies, and seamen's wages, the latter alone amounting to some $\$ 20,000$ and the whole amount to nearly $\$ 40,000$. The creditors who have recourse only to the assets of the Company, find them to amount to perhaps $\$ 150,000$, while their liabilities are esti mated not far from five times as much.- The largest topaz known was lately deposited in the Bank of France. It is from
 width and thickness, and weighs over $3 \frac{1}{\frac{1}{2}}$ lbs.-The British Admiralty have taken the (to them) novel step of addressing a circular to all the eminent shipbuilders and engineers of the country, asking for plans and estimates for iron-armored
ships of war, embodying the best combination of improve ships of war, embodying the best combination of improve
ments according to the judgment of the designer. Turret or other plans are invited, but not less than two turrets are deemed admissible.

## business and manufacturing items.

Iron.-Dublin (says Engineering), is the first British city except London, that has taken steps to procure a second steam fire engine. In America, it would be hard to name a city above fifth rate, that has not long since gone beyond its second."-A Paris order per cable for ten Crompton looms has just been received at the works in Worcester. -The New York Watch Company is to adapt and occupy the w
he American Machine Company, at Springfield, Mass.

Leather.-Tanning with "hard hack" bark has been tried, with reported excellent success. The bark is steeped without boiling, and tans calfskins in three days, the leathes being equal to the best imported, according to the Shoe and Leather Reporter.-The aniline dyes now enable the morocco manufacturers to give to their products almost all he variety and brilliancy of shades that are to be seen in any kind of dyed fabrics. Hence the growing fashion of fancy colors and decorations in ladies' shoes and other articles of
leather-Paris is the greatest leather center of Europe, having the most varied assortments in all styles.-The sug gestion has been broached to found a school of tanning, with the double object of educating competent hands for the con venience of manufacturers, and of bringing the art in this country up to the highest standards of Europe, and rencring be, in this respect. - Sheffield's machine for quilting boot soles with wire, is to be manufactured at Hopkinton, Mass., by new company with a capital of $\$ 500,000$.
Railroads, etc.-A pneumatic dispatch tube is proposed between Jersey City and Newark. The company are now raising capital under a charter granted by the Legislature of quired by the Post-office Department to prepay their mail matter over their own roads, the same as other parties.One of the telegraph companies proposes to take night de patches (handed in during the day) with twice to three times

The highest average speed of English express trains is 40 miles an hour ; ordinary trains, 18 to 30 miles; French ex press, 35 miles; ordinary, 16 to 25 ; Prussian, express, 29 miles; ordinary, 17 to 21 ; Austrian express, 29 miles ; ordi nary 14 to 21 ; Italian express, 30 miles; ordinary, 15 to 24 .
Mining.-The Canada Gold Mines now number 73; the miners, 708. The yield of gold for the last three months is estimated at $\$ 690,955$. - New diamond localities have lately been found in California. There are fifteen places in that State where diamonds have been found in washing for gold. -The Missouri Mining Bureau has been organized with a capital of $\$ 2,000,000$, for geological and mining surveys, opening and working mines and metallurgical establishments, erecting buildings and making and operating roads of all sorts, manufacturing, publishing a newspaper, and in short, doing anything in the world not inconsistent with the con stitution and the laws of the State of Missouri
Miscellaneous.-The Northwest Manufacturing Company of Chicago have thrown their business into a co-operativ concern, charging ten per cent on a capital of $\$ 100,000$ for interest, insurance, and taxes, and on the other hand paying regular wages on the ten-hour system for work, and at the end of the year dividing the nett profits of the business equally with their workmen who sign the articles of association. The latter can invest their dividends as capital in the concern, if they see fit.-Female domestic labor in Colorado commands $\$ 40$ to $\$ 50$ a month, and is scarce at that.Wooden pavement men may profitably study the case of a creosoted sleeper recently taken up in Scotland after 21 years service as fresh and tough and smoky-smelling as ever. The original cost of the creosote used was ninety cents.- Some of the journeymen trunk makers of New York have taken steps to follow the example of the 25 printers and form a co-operative establishment.-The business of the Russian American Trading Company in ten years, from 1850 to 1860 , is stated at $\$ 6,426,413$ in receipts, and $\$ 1,017,000$ in divided pronits; the capital having been in 1833 about $\$ 2,000,000$.The distillation of pine wood is carried on in New Orleans, re alizing, as reported, from a cord of "fat" pine 40 gallons of turpentine, 1 barrel of rosin, 1 barrel of pitch, 100 gallons of pyroligneous acid and 50 bushels of charcoal; the whole worth $\$ 60$ and costing $\$ 10$.-There are in the State of New York 372 cheese factories which work up the milk of 168,166 cows. The other States and Canada are reported to the American Dairymen's Association as containing 114 factorie and employing 53,927 cows, of which Ohio has nearly three fourths, while New York has over three-fourths of the whole -The firing of the converted Snider-Enfield rifles by the 83d regiment at Gibraltar, proved very satisfactory, the inde endent firing sounding like one long, continuous volley.The preservation of milk in cans from which the air is ex pelled by heat, as in canning fruits, has been tried with success by a M. Malrun, who has received a prize of 1,500 francs there for from the Academy of Sciences. The miik was found by the Committee quite fresh and sweet after six months preser vation.-Hammonton, N. J. (says the Culturist), contains perhaps the largest breadth of land in one body set apart for small fruit, to be found in the United States. Within a space of say three miles square, nearly a thousand acres are devoted to strawberries for the New York and Philadelphia markets. Ten years ago, this great garden was a wilderness without nhabitants, and the first settler, Capt. Fay, was obliged to beg of the railroad company, as a favor, to stop a freight frain there and let him throw off into the woods the material for the first building.

## CURRENT RECIPES.

To Purify ${ }^{\text {ater, by a process promulgated by a Mr }}$ Booth of Birmingham, put in it a neutral solution of bi-sul phate of alumina, in the proportion of one ounce to 435 gal ons. The sulphuric acid of the sulphate decomposes the bi arbonate of lime in the water and forms an insoluble sul phate of lime instead. The hydrate of alumina being set ree, forms with the organic matter in the water another in soluble compound. Both these fall to the bottom, and the remaining freed element, carbonic acid, lends an agreeable quality to the water.
A White Paste, adhesive to all surfaces, is said to be made as follows:-A solution of $2 \frac{1}{2}$ ounces gum arabic in two quarts warm water, is thickened to a paste with wheat flour ; to this is added a solution of alum and sugar of lead, 720 grains each in water: the mixture is heated and stirred about to boll nd is then cooled. It may be thimned, if necessary, with he gum solution.
Coal Tar is recommended in the Chemical Nevos as an ex cellent coating of cisterns and reservoirs, to protect water from the lime and other salts contained in the cement. The tarry taste, if we may believe the writer, disappears in a few tarry
days.

Pickling Vegetables, as well as salting meats and tan ing leather, is effected without loss of time by the pneumat c process: exhausting the air and letting in the liquid un der atmospheric pressure so as to force it instantly through the opened pores and cells.
Putty for Stove Joints may be made by wetting together fine salt with double its bulk of fresh hard wood ashes. If a harder cement is wanted, use iron filings with white ead and linseed oil. It should have a day or two for hardening
To CUT GLass to any shape, without a diamond, hold it quite level under water, and with a pair of strong scissors clip it away by small bits from the edges.
A PvTTY of starch and chloride of zinc, hardens quickly and lasts for months, as a stopper of holes in metals.

Improved Heating Furnace. The engraving represents a furnace for heating apartment through the Scientific American Patent Agency, Oct. $24,1865$. The invention consists in the use of separate tubesintroduced into the heating chamber of the furnace,so that each apartment is supplied with heated air by independent pipes; in the employ issupplied withes of com-
ment of air tubes of com paratively small diameter passing from the externa air to the interior of the heating pipes, and in the application of the heated air from the furnace to culinary purposes, afte which it may be used for other purposes.

A, in the large figure, is the fire chamber of a fur nace which rests on a bottom plate, into which are inserted tubes, $B$, surrounding the fire box. The furnace is supported on legs and the whole is inclosed by a drum which has a door to correspond with the door, C, and an open ing for the admission of air below the fire box. The air thus admitted is divid ed, so that a portion of it passes into the space be tween the furnace and the outer drum, and another portion passes into the pipes, B. The pipes, D, con duct the heated air to dif ferent apartments or to a cooking stove, seen at E , on an upper floor, or to a baking oven or a looiler for heating water, desirnated heating water, designated by the letter, F. From either of these the hea may again be passed to other apartments by means of the funnel and pipes, G, which may be attached to the stove, oven, or boiler The pipe, $H$, attached to the inverted cone over the fire box conveys the sroke to the chimney flue. Small air pipes are introduced into the hot air flues and into the pipes of the boiler, F , having their outer end


## BENNETTS APPARATUS FOR UTILIRING HEAT

extending into the external atmosphere. They are seen at $I \mid$ with improper connections. Our somewhat censorious re in the different figures. The object is to increase the combus- marks are supported by the facts, so far as we can gathe tion of the gases and the draft. Dampers are located at any points required to regulate the flow of the external air ad mitted or the heated air gener
Further information may patentee, at Newcastle, Pa .

## THE BOILER EXPLOSION IN PHILADELPHIA.

The ostensible facts in regard to the terrific boiler explosion which occurred in Sansom street, Philadelphia, on the 6th of June, are already familiar to our readers through the medium of the news journals. By this lamentable accident not less

than twenty-eight persons were killed and seven seriously wounded. Out of forty-three within the immediate limits of the disaster only eight escaped. One of two boilers exploded, when, according to the statement of the engineer, taken while in hospital, the steam gage showed only one pound of steam! The wonder at the discrepancy of this statement, will be panying engraving taken from a diagram in the Philadelphia Inquirer and corrected by a sketch from a correspondent.
ments of either; Over Dining Tables.-Being suspended at various intervals, over the middle of long tables, a perfect draft will be created ; flies will be dispersed, and useful space will not be occupied; In Parlors.-They can be suspended so as to be both ornamental and refreshing. Bouquet vases may be attached, thereby imparting the fragrance of flowers to the circulating air ; In Dancing Halls and Theatres.-Large sized fans can be so distributed as to make the air circulate freely hrough the largest halls, without in the least obstructing the room ; In Mining Tunnels.-Large sized fans propelled by

clock weights, can be so arranged as to create a perfect cur rent of fresh air, dispelling all impurities,
In the Southern States, East and West Indies, Mexico, South America, and in fact, all hot climates, this invention must be useful.
It was patented Feb. 26, 1867, through the Scientific American Patent Agency, for J. A. W. Lundborg and Chas. W. San ger of San Francisco, California. For further particulars or for exclusive right of manufacture, apply to Dr. Eugene F. Sanger, Bangor, Maine.

## AN IMPROVED POCKET KNIFE.

One of the neatest and most convenient devices we have seen is an improvement in pocket knives recently patented through the Scientific American Patent Agency both in this country and Europe, by Mr. William Sausser of Hannibal, Marion Co., Mo. Instead of being secured to the handle in the usual way the shank of the blade has a curved or angu lar slot extending from the usual place of the rivet out through the edge of the shank on the side nearest the blade's edge. By means of this slot one blade can be removed instantly and replaced by another. To effect this removal where the back spring is quite stiff, the inventor has contrived a neat spring holder which takes the tension of the spring from the blade, or the shank of the blade may be so formed that the tension of the spring upon it when closed is very slight, and in that position it may be slipped out and another blade inserted.
This will prove an admirable contrivance for surgeons, gar deners, farmers, and others who require a number of different blades, as a handle of convenient size and form will serve the same purpose as one containing a number of fixed blades or as several separate knives. Its intrinsic utility will probably secure for it a very general adoption.

A Want Supplied.-In No. 24 current Vol. we published the expressed desire of a correspondent for an improved to bacco pouch. Since that was written we have seen and used a pouch that appears to be exactly what is wanted. It is a bag of any proper material having a mouthpiece with a projecting annular lip to engage with the pipe bowl, and inside is a rammer worked by a button or knob on the outside of the bottom. With this simple contrivance the smoker may load his pipe in a gale or in the dark without wasting a par ticle. It was patented Feb., 1867, and can be obtained of the agent, Wm. A. Hammer, 448 West street, New York.

The Industrial Art Schools of France are to be imitated in England. A provisional committee was appointed and a subscription opened at a meeting of English gentlemen in Paris a few days since.

## THE WORKING GENTLEBLIN

The children of luxury and pride are not the only ones who need to be taught the dignity of labor. The sons of toil themselves do not always appreciate their work and station duly. We see this in various ways : sometimes in a jealous and envious aspect toward the rich, sometimes in a cringing and sometimes in a defiant attitude toward employers, and often in a sensitiveness with regard to their social. position which is quite opposite to conscious dignity and genuine selfrespect. False pride perhaps finds its deepest disguise often in the best working men, in a repugnance to the cultivation of taste and courtesy, as something out of caste and characte for them.
In such sense as pride is permissible, a man should be unaffectedly proud of his industry, his usefulness and his self denial, and placidly despise the gilded opposites of these which men are prone to worship or to envy. He should real ize that these qualities are so much more honorable than all others, that it makes no practical difference, in the compari son between men's stations, what their work is, so long as it is nobly done. Truly said the poet-

## Honor and shame from no condition rise: Act well your part: there, ALL the honor lies.

It is not, therefore, especially for the discipline of dainty coxcombs, who seldom come within our reach, that we reproduce the hearty lashing which the Charlottsville Cihronicle administers to the young men of the South. It is good for
false pride and effeminacy in all latitudes, whether swelling in broadcloths or fretting under denims.
"There is a vastdeal of jdleness in the South. There are young men pretending to practice law or physic : young men instruct ing a half dozen pupils; young men selling a few yards of ribbon per day; young men who have no business there, at college: young men "farming," all of whom ought to be differently occupied. There are young men clerking it in hotels and banking companies where there is not full employment for them. There are young ladies by scores engaged in reading novels, or entertaining beaux. There are all sorts of agencies, ten thousand shifts to live, no matter how, so that it is not by manual labor. In a word, the market of head-work is glutted in the South, while the hammer, the plane, the trowel, the hoe, the ax, are crying for stalwart arms to grasp them.

The idea is that a trade is not just the thing for a young man who considers himself as good as anybody. It is thought a better thing to be a jack leg lawyer, or to murder people with a doctor's diploma, or to weigh butter, than to build a house, or make a sewing machine, or construct a steam engine. The agent of somebody's vegetable pills is thought a more eligible match for your daughter than the man who prints a newspaper or a book. So it is a foolish and often fatal pride which makes thousands shrink from the mechanic arts ; and those very men who, lyy a life of honest industry, able competteng posirn the back upo the occupations, and trim their sons out for something that will not soil their white hands. We shall not prosper in the South until all these folks go to work, nor until labor with the hands is properly estimated.'

## the manufacture of straw goods in the united STATES.

Thomas Coryat, the "Odcombian leg stretcher," as he wa pleased to call himself, because of his extended pedestrian tours throughout Europe, in a narration of his travels pub-
lished in 1611, states that "delicate strawen hats" were worn lished in 1611, states that "delicate strawen hats" were worn by men and women in some parts of Italy, particularly in the country around Piedmont. This is the earliest record we possess concerning the plaiting of straw, although undoubted ages. Indeed the first plaited goods made in this country were the work of the negroes brought over in the slave ships, who, it is related, of their own accord betook themselves to the manufacture of round hats from the inner lamina of the palmetto bark.
Hats and bonnets of Leghorn first became favorably known in England in the eighteenth century, and straw from that country was introduced with the Italian mode of working Native grasses were also employed, although being much larger in size than the Italian, goods made from them had a clumsy appearance until the plan was adopted of splitting the straws. The neighborhcod of Dunstable, England, for nearly a century enjoyed a wide celebrity for the excellent hats made from wheat grown on the chalky soil of that locality. It wa idence, R. I., that in 1781 attracted the notice of Miss Betse Metcalf and induced her, without instruction or any opportu nity of unbraiding a plait, to attempt and successfully accom plish the task of making for herself a similar hat of oak straw which she cut, smoothed and bleachel in sulphur fumes. fac simile of this bonnet is preserved by the Society for th Encouragement of Domestic Industry, and is reçarded with
the greatest interest as being the germ which has since de veloped into an extensive branch of industry. By the exertions of this lady the trade of straw working became quite common, especially in the New England states, and thence gradually extended throughout the country. In 1801 the first manufactory of straw goods was started in the town of Wrentham, Mass. This for many years continued to be the leading es tablishment in the country.
In consequence of heavy importations of common. straw goods made by the cheap labor of the Irish, attention was turned to the closer imitation of the Leghorn hats, then so highly prized. The initiative in this matter was again taken by a lady residing in Weathersfield, Conn., who in 1821 lai before the Loudes Society for the Encouragement of Arts and $\left\lvert\, \begin{aligned} & \text { wa }\end{aligned}\right.$

Manufactures a bonnet which the London dealers declared equalled in firmness and color the best imported Leghorn The material employed was the culm or stalk of the indigen ous spear, wire or meadow grass, a species of poa. Stimulated by success and the extravagant prices which were readily obtained for nice work, other native grasses were experi mented upon, and new manufactories sprang up in all sections of the country. In 1840 the total value of straw bonnets and hats made in the United Siates was $\$ 1,476,500$ According to the last census seven thousand hands were employed in the large manufactories of straw goods, turning out five million dollars worth of goods yearly. This is exclusive of the palm leaf-hat manufacture, which would increase this sum nearly million. The finer braids or plaits used in making up bonnets or hats, are still largely imported from Italy, Switzerland China and Great Britain, and some of the coarser braids are brought from Canada. The annual valuation of hats and bonnets of Leghorn, straw, chip, grass and other vegetable materials thus imported is given by the authority befor quoted as $\$ 1,603,239$. New England, and particularly Massa chusetts, is the section most interested in the straw manu facture, and through the country towns and villages grea numbers of women and children find remunerative employ ment, who are not classed as operators in the figures given above. A later estimate gives the production of Massachu setts at $6,000,000$ hats and bonnets annually. Philadelphi sends
year.

## LYON'S MACRINE FOR-CUTTING STUBS.

The engraving shows a very handy machine which will be appreciated by blacksmiths, machinists, and iron fence mak ers. It is a contrivance for cutting "stubs" from the bar for the connections between the bars of iron fencing, and for cut ing wire and small iron into convenient lengths for man urposes.
The stand of cast iron supports at the top a pinion, A which is a portion of a hand lever, by working which motion

is given to the segmental plate, $R$, that swings on a stud The inner face of this plate and that of the stand have har
dened steel dies, beveled by their edges across their dened steel dies, beveled by their edges across their seats
and their faces working in close contact. A hole on each and their faces working in close contact. A hole on each
side of the pivot of the plate, B, passing through plate, stand and dies, receives the iron to be cut. The gage for length of the stubs is seen at C. It can be adjusted by a set screw or wung out of the way as may be desired. The lower par has a pivoted bell crank lever, one end of which forms the top and the other engages with a spring, D , which holds it in place, and yet yields sufficiently, as the iron is fed in, to hlow the stubs to drop as they are cut. The operation is readily comprehended. The iron is passed through the holes when the plate, B , is in an upright position, bringing the holes in the parts in line, and then an elevation or depression of the lever severs the rod, the action being analogous to hat of a pair of shears. The machine is portable, or it can is secured to a bench or shop use. When the dies are dul It was easy matter to remove and repair them.
It was patented through the Scient fic American Paten Agency May 28, 1867, by Warren Lyon, whom address for other particulars, 25 Eighth Av., New York city.

Binding.-Subscribers wishing their volumes of the Scien ific American bound can have them neatly done at this ffice. Price $\$ 150$.

Label for Plants, Sierubs, \&c.-It is said that zinc plate written upon with a common lead pencil, forms an enduring

## BRIQUETTES.

One of the best illustrations of the utilization of waste or valueless products to be seen at the Paris Exposition, is the collection of artificial fuels there exhibited. Belgium, France and Austria, who have taken the lead in this matter, con ribute as the results of their experience, samples and model f machinery for the manufacture, from hitherto useless subtances, of a cheap and valuable fuel for industrial and do mestic purposes.
The principle of making refuse combustible materials co here by incorporating them with some adhesive substance, forming thereby a solid mass of artificial fuel, has been prac ticed by the Chinese and other nations for centuries, but the pecial interest of these samples lies in the employment of mproved cementing materials. Although the particles of ome kinds of bituminous coal will cohere when subjected to ressure at a slightly elevated temperature, forming a block of considerable strength, to stand rough handling in trans portation, some cement must be found which will more firmly bind the coal particles together. Common clay was first use or this purpose, but being itself incombustible, the large mount of ash formed proved objectionable, and recourse wa had to coal tar with excellent results. In the countries refer ed to above, where this kind of fuel, under the name of bri quettes, or carbon agglomere, has been extensively experi mented with, a residue in the manufacture of starch has been lately employed as a cement, a substance valueless for other purposes, and having advantages over clay in that it leaves no ash, and does not, like the coal tar, melt and thus lose part of its binding effect at a high temperature.
The form of the fuel depends upon the kind of machine ased in compressing it. In M. Evartt's machine, which is very highly spoken of, the material is forced through iron ubes, so that the fuel has the appearance of a $\log$ of wood M. Mazeline's appears to be constructed similarly to a mode rick machine, the material being fed into prismatic molds and compressed by a square piston in each. While still damp, these blocks are placed in a kiln and warm currents of air are passed over them for the space of three hours, when they are ready for use.
Another machine exhibited is that of M. Dehaynin, being modification of the one first mentioned. With its engin and all accessories a machine capable, with an eighty-horse motive power, of turning out ten tuns of fuel per hourweighs sixty-five tuns. M. Dehaynin's works furnished 175 00 tuns of this fuel last year, which he sold to railroad con e The navy, and a large quantity for household purp . The samples sent by the Northern Railway Company of prismatic in form, weigh about eight pounds each, and in actual practice on locomotives, are found to evaporate from $7 \cdot 1$ to $7 \cdot 2$ pounds of water per pound of fuel. The annual production from these works exceeds 170,000 tuns.
The saving of space in storage, from the compactness of this fuel, is in itself a great recommendation, the cost is trifl ing when compared with ordinary coal, while its convenien orm, cleanliness, and high heating effect have given general satisfaction wherever it has been introduced.

Magnesium and Magnesium Lamps.
Some contrivance is much wanted to get rid of the copious though harmless, white smoke given off by burning magne sium. No apparatus for doing so, except the long expanding chimney already mentioned, has yet been introduced into the market. As the smoke is nothing but freshly calcined mag nesia, which can be chemically altered by scarcely anything but acids, and is insensible to the action of the intensest heat the problem is a difficult one. It is found in the present lamps, to very quickly coat the metallic sides of the chimneys, so that fixing a box with partitions above the chimney, smoke being made to take a circuitous route will encounter a very large surface on which much of it will be deposited, and the rest escape. Shallow dishes filled with weak sulphuric acid, placed on each of the interior shelves, would still further ab orb the smoke. Mr. Larkin has tried many experiments to consume the smoke by causing it to roll over a large surface of felt soaked in weak acids and fixed in cylindrical chimneys He has also exposed the smoke in the chimneys to slowly run ning or trickling streams of weak acids. In some of the ex periments about seventy-five per cent of the smoke was abo ished; still no apparatus has been introduced by anybody to practically and economically get rid of the smoke of burning magnesium. In one of the experiments made by Mr. Larkin he employed felt soaked in weak acetic acid, and was much urprised to see the smoke which did escape turn over th side of the chimney and fall down on the table, instead of rising to the ceiling as usual. He attributed the phenomenon to the partial decomposition of the volatile acetic acid int heayy carbonic acid gas, which fell over the edge of the top of the chimney and carried down smoke with it. Possibly, by following up the clue given by this experiment, a smoke con uming chimney can be made in which the smoke shall fal into a proper receptacle, now that it is proved to be possible o separate it from the upward flow of warm air
Mr. Samuel Mellor, the manager of the Magnesium Metal Company, has made many experiments with the alloys of magnesium with zinc, tin, antimony, copper, thallium, lead and other metals. Some of the results obtained were curious. An alloy of lead and magnesium burned very slowly ; an a loy of ten per cent of zinc and magnesium had a specific gravity considerably greater than that of the two metals when isolated ; a fifty per cent alloy of zinc and magnesium was found to be more brittle than glass; an ingot half-an-inch in diameter, when allowed to fall upon a stone floor broke in pieces, and the fragments were easily pounded to dust in a
mortar by hand. The alloys of magnesium with zinc are variably acted upon by acids, some of them dissolving with violent ebulition, and others in which the proportion of zinc is large, being nearly or quite insensible to their action. These alloys with zinc all burn readily, but the flame though brilliant, is not so rich in the lavender and extra violet rays of liant, is not so rich in the lavender and extra violet rays of
the spectrum as pure magnesium, so is not so well fitted for the spectrum as pure magnesium, so is not so well fitted for
photographic operation, or other purposes where actinic rays photographic operation, or other purposes where actinic rays
are necessary. An alloy of fifty per cent of thallium and magare necessary. An alloy of fifty per cent of thallium and mag-
nesium burns very steadily and slowly, but the magnesium nesium burns very steadily and slowly, but the magnesium
flame is so brilliant that it completely masks the green flame flame is so brilliant that it completely masks the green flame
of the thallium. Mr. Mellor has also recently discovered that a small proportion of thallium added to magnesium makes it very tough and pliable-a quality of some value, considering the ribbon and wire of unalloyed magnesium are so brittle.
Magnesium has recently been applied with the greatest suc bess in pyrotechny. The powdered metal when covered with paraffine, is preserved from the action of acids and alkalies, and can safely be employed in the manufacture of fireworks. If only from two to five per cent of magnesium be mixed with the ordinary rocket powder the light is greatly intensified; and the effect was seen to great advantage in the recent pyrotechnical displays at the Crystal Palace. In rockets the dense white smoke produced by magnesium is an advantage rather than a loss ; for the canopy then seen floating like a net work of snow-white gauze over each burning star, not only adds by its appearance to the beauty of the display, but reffects downward an additional amount of light. The use of the magnesium powder in rockets for signals at sea deserves the investigation of the authorities at Woolwich, as the light is so greatly intensified at so small a cost. The American Government is now seriously considering the desirability of adopting the magnesium light as their signal light for the service, both in lamps and out of them. At the Wimbledon meetings the light was employed with good effect, the magnesium balloons being generally mistaken by the public fo nesium balloons being generally mistaken
meteors.-British Journal of Photography,

## PETROLEUM FOR STEAMERS.

Calculations of the relative economy of coal and oil as fuel for ocean steamers, should take into account the important item of firemen and coal passers, their wages, weight and quarters, in addition to the difference in weight and space of furnaces and perhaps of boilers. In the recent experiments on board the Palos, at the Charlestown Navy Yard, it has been found that with three of her four boilers. and the attendance of three men, fifty per cent. more revolutions of the wheels were obtained than heretofore with coal under all four boilers with the attendance of twenty men. But the greatest prob able difference may be realized from a more perfect utilliza tion of the force contained in the fuel. It is well known that
as yet but a small per centage of the theoretical power of as yet but a small per centage of the theoretical power of
fuel has been obtained through steam. Coal heat is mostly fuel has been obtained through steam. Coal heat is mostly
applied by radiation. Oil, with proper apparatus, may be brought, in a state of combustion, mainly into direct contact with the boiler surface. How great a difference this may effect in practice, can be determined only by proper experiment.
So that the question between coal and oil can not be ciphered So that the question between coal and oil can not be ciphered out entirely from theoretical data.
In this experiment, petroleum was the oil supplied from two large iron tanks placed on deck, each tank having a glass gage at its side, to indicate the hight of the petroleum, and a vent pipe on the top to permit the escape of vapor. From these tanks the petroleum was conducted by half-inch pipe to the boiler furnaces, dropping into iron retorts, heated by burners placed beneath them, and being instantly vaporized
This vapor, in burning, was mixed with steam-decomposed This vapor, in burning, was mixed with steam-decomposed
by passing through pipes partially filled with iron filings, by passing through pipes partially filled with iron filings,
and with air forced in by a common air pump. The heat thus and with air forced in by a common air pump. The heat thus
generated was intense ; and the combustion so perfect that no smoke was perceptible. A diminution of the supply of air or steam at once created a smoke.
Commodore Rodgers, commandant at the yard, is so well satisfied with the three days' experiment, that he has determined to apply to the department at Washington for permis sion to make a trial trip at sea with the Palos.

## Metropolitan Transit.

The New York city Three-Tier Railroad, having failed of a special charter, is to be built if possible under the general railroad law. The company, it is understood, have drawn up their plans and made preparations to apply to the courts to appoint commissioners of appraisal for the property to be taken, where not obtainable by private negotiation. Their proposed line runs from Canal street between Green and Wooster to the north rear of Bleecker street, there curving west to the west rear of Sixth Avenue, which it follows to Central Park, thence following 59th street to Ninth Avenue the line of which is followed to the Harlem river. The hope appears to be that the comparatively unimportant character of most of the buildings on this line, will permit negotiation to be successful. The buildings for the road are to be of four sto ries and substantially constructed, so that the running of the cars cannot create the least perceptible vibration. Steel rails will be used, and, by the use of a peculiar chair avoiding joints it has been demonstrated that a loaded car twenty miles an
hour, will not make as much noise and jar as an ordinary omhour, will not make as much noise and jar as an ordinary om-
nibus. The cars, seating passengers, will be entirely of iron nibus. The cars, seating passengers, will be entirely of iron,
propelled by compressed air, carried in reservoirs under the cars.
Electrical Effects on Metals.-Edlund has recently (1866) shown that the passage of a current through a wire, produces an expansion independent of that of heat. Ruhmkorff states that a bar of soft iron acquires hardness during contact with one of the poles of an artificial magnet.

## EXPOSITION NOTES

Sewing Machines.-In the English depariment there is nothing of novelty.-Among the French machines is one having an overstitch arrangement for the glove manufacture. It is a nearly exact imitation of the action of hand sewing, even to the tightening of the thread by a lever acting like the seamstress' little finger. The needle is threaded with the conventional needle-full, is placed in a needle holder which pushes it through the material, is grasped on the under side by another holder which pulls it through while the first lets go, and then returns it to the upper holder, passing it outside the material. Back-stitching might be effected in this way as perfectly as by hand, using a needle pointed at both ends, with the eye in the middle.-A crotchet embroidering machine is exhibited, in which the usual crochet chain-stitch is applied to pattern by means of a needle actuating a universal feed motion in all directions at the pleasure of the op-erator.-The American button hole machines and attachments are prominent objects of attention in this line.-Arrangeare prominent objects of attention in this line.-Arrange-
ments for a light motive power, by means of a head of water ments for a light motive power, by means of a head of water
from the upper story, or otherwise and of electricity, are on from the upper story, or otherwise and of electricity, are on
exhibition. A very simple electrical motion is shown, consist ing of a wheel on the driving shaft, with several projections on its edge and a deep groove in its center: in this groove is wound a coil, and on the shaft is placed a commutator, so that on revolving the several projections of the wheel are convert ed into electro-magnets. Revolving within a framework furnished with projecting plates of soft iron, the electro-magnets are attracted by the plates in succession, and motion is main tained. A Bunsen's battery of four elements, supplies the
ower
Creusot Philanthrophy.-Among Messrs. Schneider \& Co's 10,000 wcrkmen, 500 have within the last six years be come proprietors of the comfortable model cottages erected by the firm. They form altogether quite a large town, of not less than 23,000 inhabitants, whose natural increase proves by statistics to be four times the average of France in general, the mortality of children being remarkably small. There is no poverty from sickness, accident or death, for the unfor anate are amply provided for by the provident fund the fund all abue to work pay $2 \frac{1}{2}$ per cent of their wages. The fund
amounts now to $\$ 60,000$, and there are also $\$ 50,000$ of the workmen's wages in the savings bank. There is no magis rate, no lawyer, and no policeman in the community, and he number of crimes is less than the average proportion of he country at large
Bronzed Iron from the Tucker manufacturing Compan of Boston, attracts much notice from foreigners. It is pre pared by oiling the surface very thinly, and then heating is a stove at the temperature which ordinarily imparts a blue int, so as just to decompose without charring the oil, at the ide takes a brown color and a tenacious solidity from embody ing the resinous element of the oil. The surface thus formed has the lustrous metallic appearance of bronze and great du rability, and seems to be reproduced under the influence of he atmosphere, if correctly represented, in spots where it worn away by attrition. The manufacture is to be intro
duced in France duced in France.
An Enormous Balloon confined by a cable which unwinds from a drum, is to make hourly ascensions from the middle of the Exhibition, carrying up twenty or twenty.five persons to a hight of three or four hundred feet. It is to be red hot charcoal, at a cost not over $\$ 275$ per 1,000 feet balloon is reported to be a perfect sphere of a diameter of 21 meters (nearly 70 feet!) composed of two very fine and clos tissues cemented together with several coats of caoutchouc
varnish and covered with linseed oil. It is calculated that the vast ascensional power will resist material deflection by the wind. The author of the scheme is Mr. Henry Giffard he inventor of the injector.
a New Gas Engine, exhibited by Otto and Langen, has some interesting and possibly valuable peculiarities. The piston is shot upward through the length of the cylinder by the explosion at its foot, but does no work at this stroke, moving freely. The elastic pressure of the air against the vacuum thus formed, stops the piston gracefully, and sends it ack with the whole force of the atmosphere pressure, added oo the weight of the piston; this time gearing into a pinion and doing good service. The necessity of electricity or double ighting contrivances, together with the excessive heating of the cylinder by explosions at both ends, are obviated by this rrangement.
A Water Purifier by Durenne, to remove carbonate of ime, consists of a tall, rectangular compartment or closet, furnished with a series of trays in the manner of shelves, from each of which, beginning at the top, the water is allowed to overflow in a thin film, falling upon the next below, the whole being constantly exposed to the action of waste steam from the engine. The heat volatilizes the carbonic acid and precipitates the lime in the trays, from which it is removed in solid slabs.
another Ice Machine, produced by Carre, the maker of the ammonia freezer, produces cold by accelerating the evaporation of water in the presence of sulphuric acid in a vacuum, absorbing the heat of the water into vapor so rapidly that ice is formed in three or four minutes after the air pump begins to work.
A Safety Switch from London interlocks the levers which act upon the several switches and signals in such a manner that no one can be moved unless the others are in the posi tion the.
place.

Tanning.-The report of the Committee on this depart ment contains the somewhat unexpected conclusion that "with reference to the various processes claiming merits in their rapidity of tanning, no definite advantage has yet been found, and the period required remains about the same as be fore."
A Double Cylinder, copperplate, printing machine, printing both sides of a continuous sheet in succession, is in operation on school copy books. The cylinders revolve in a trough of ink, which is scraped off for the impression of a "doctor." A Liverpool printing firm have purchased the English patent and introduced the machine there.
Denmark exhibits ancient breech-loading cannon used 400 years ago, almost of the exact pattern of Krupp's-but prob ably not quite as good. Also revolvers of old time, not quite equal to Colts, but on the same general principie.
Russis exhibits samples of manufactured cottons and wool lens, and even silk goods from the borders of the Caspian Sea. The Endless Band Saw is applied to sawing boards and imber, with great economy of power and time.
Woods (American) Mowing Machine has won the first prize Gold Medal.
A Safety Switch has been tested and adopted on the Philadelphia \& Reading Railroad, which bridges across the main rail without interrupting its continuity, and can operate to conduct a car from the main track only while pressed into its position by the switchman. A guide rail laid close inside the track, on the side toward the turn-out, is the only modi fication of the main track required. The outside switch rail is some four feet longer than the inside, and is slightly arched is some four feet longer than the inside, and is slightly arched,
so that when it is brought up snug against and level with so that when it is brought up snug against and level with
he track rail, (the wheel being also pressed close to that side the track rail, (the wheel being also pressed close to that side
by the guide rail above mentioned) the tread of the wheel by the guide rail above mentioned) the tread of the whee
will cover it and ascend upon it. On reaching the hight of will cover it and ascend upon it. On reaching the hight of
the arch, the wheel will be raised enough to clear the main rack rail and pass over upon the turn-out rail. At the same time, the inside switch rail, which is pointed, and pressed into contact with the opposite main rail, receives the tread of the other wheel and guides it in a parallel course with the first. At the point where the inside switch rail in its turn must cross the main rail, another arch bridges over the main rail with a joint opening, and closing at the crossing point, unless he ordinary frog is there employed.

Bread Associations.-In no article is there more room for mprovement and increased economy than in bread. As purchased from bakers or as made in kitchens, it is generally both poor and extravagantly expensive. In fifty families here may be one good bread, cake, and pie maker at command ; and that one, with a single oven, could supply the fifty families much better and more cheaply than they can bake for themselves. A number of French families have demonstrated this by uniting in a co-operative society under the name of "L'Association des Consommateurs" (The Conquality, at eight cents a pound : a reduction of full twenty per cent. from current prices.

Cigars at the Sea Shore--Every cigar maker knows the difficulty of keeping cigars dry on shipboard and of preserving the aroma of an ever-so-fine Havanna,on the sea coast. Travelers and sojourners at the sea shore who have been at their wit's end to devise a means to protect their cigars from the influence of salt air, will find a simple remedy in the use of a common glass fruit jar fitted with an air-tight metalic or glass stopper

## zecent ghmeriaw and forign ceatents.


Evaporator.-Samuel M. Williams, Pine Village, Ind.-This invention has for its object to furnish an improved evaporator so constructed and arranged that the fre may be directed under either of the eans atpl.
may be shut off from either or all of the pans as may be deired.
WAsirixg MAchive.-E. F. Wheeler, Sag Harbor, New York.-This inven. ed and arranged as to wash the clothes quickly and thoroughly and with a slight outlay of power.
RoAD Soraprr., -N. Evinger, San Ford, Ind.-This invention has for its
object to furnish an improved road seraper so constructed and arranged that It may be attached to and used in in oonnection with an ordinary plow.
ETAPoonatixd PaN.-S. P. Dyer, Prairie Depot, Ohio.-This invention has
foritsobject to furnish an improved evaporating pan for making siru for its object to furrish an improved evaporating pan for making sirup or sugar trom cane juice sorghum juice,etc., and for making cider jelly so con
structed and arranged that the various operations of evaporating skimming and finisaing may be conveniently carried on at the same time.
Fencr.-E.C. Roberts. Salem, Mich.-This invention has for its object to Furnish an improved straight rail fence so constructed that the rails and stakes will bind each other frmly securing the fence against wind or ani mals.
SLuIIGH BRaKR.- William Sloan, Highland, Iowa--This invention is de
signed to furnish $a$ neat, simple and convenient brake for attachment to sleighs.
Nrw
New and Usefud Attacharest for Lantrin Lasps.,-Jacob Silvins and Wm. T. Haine Sunbury, Pa.-This invention relates to certain new an
useful attachments for the lamps of lanterns, whereby the wicks of the former may be adjusted, raised and lowered, and the wicks also deprived of any crust which may be upon them without removing the lamps from the lanterns. This invention therefore, it will be seen, a amitso of the wick of a
lantern lamp being adjusted at any time, even out of doors in a strong wind lantern lamp being adjusted at any time, even out of doors
without the least danger of having the light extinguished.
New and Improved Metallic Clasp or Tie for bags.-D. b. Baker, Kollersville, Ohio.-This invention is designed to supersede the cords, strings,
and thongs now employed for tying bags. The invention consists of a me tallic clasp composed oftwo semi-circular parts connected at oneend by a
link and secured around the bag by hook on the opposite end of one part link and secured around the bag by a hook on the opp
fitting in one half of a series of holes in the other part.

Machine for Tempering Wire.-P.L. Slayton, New York City.-This in vention relates to a new and improved machine for tempering wire, and is more especially designed for tempering wire braces for umbrellas and pa

BALING Press．－J．C．Duvall，Sardis，Miss．－This invention relates to a new
and improved baling press of that class designed more especially for farmers and improved baling press of that class designed more especially for farmers， be operated by horse or mule power． lates to a new and improved sugar evaporator designed more especially tor evaporating the sirup of northern canes and to admit of the work being done evaporating the sirup of northern canes and to adm．
in a perfect manner by persons of ordnary ability．
 lothes without sewing them to the clothes，and in such a manner that，while the button cannot be torn from the garment by for
moved at any tome for convenience in washing，etc．
Draining Maciine．－A．P．Routt，Liberty Mills，Va．－The object of the present improvement is to provide means whereby a more steady and per－
fect operation of the plow is effected，and whereby the dirt is cleared away fect operation of the plow is effieted，and whereby the dit
from the edges of the ditch to afford tree access of water．
Watch Safety Pocket．－R．M．Fisk，Olney，Ill．－This invention consists
of a plate attached to the back band of the pantaloons，or other garment， with a hook protruding through a button hole into the pocket；upon this hook the watch is hung and secured thereon by a prong operated by a spring the plate
Combined Planter，Coltivator and Roller．－D．Duncan and E．R． Ridgeley，Olney，Ill．－The object of my invention is to construct a machine
which shall be capable of being used as a planter，a cultivator，or a roller，or all together，and which while it is convenient to manage in the field，shall be trong and durable．
Maat Cutter．－D．S．Early，Hummelstown，Pa．Patent dated June 11， 1867．－The meat block is rotated on a vertical axis by the impulse of a pinion on the axis of the master wheel，the latter drives a pinion on the
shaft provided with cams which lift the knives consecutively and release hem to fall by therr weight and the force of the spring upon the cutter block．
Rice Culitivator．－G．W．Cooper，Ogeechee，Ga．Patent dated June 11， 1867. －In this invention three objects are attained ；tirst the width of $t$ s s plow of the beam less than in ordinary plows；third the shape of the teeth renders them less liable to break than are those of the common plow or cultivator Brerch Loadina Fire Arms．－Robert Errett Stephens，Owen Sound breech－loading fire arm which by the action of cocking throws open the breech－loading fire arm which by the action of cocking throws open the
breech and dislodges the shell of the exploded cartridge simultaneously． Combined Seeder and Fertilizrr．－Ansell P．Routt，Liberty Mills，Va Patent dated June ft，1867．－The object of this invention is to construct a
machine which will drop the fertilizing substance and the seed in the hill together in the proper manner，and which will be simple，cheap easily
worked and not liable to get out of repair． orked and not liable to get out of repair．
Weatherstrip．－J．b．Wardwell，Georgetown，D．C．Patent dated June 11，1867．－This strip is formed of a plate of india－rubber and with the springs
bearing upon its upper surface is attached to a horizontal rotating shaft bearing upon its upper surface is attached to a horizontal rotating shaft
moved by the closing of the door，a stud on the door casing impinging upon a lug on the shaft．
Brick Press．－Christopher Becker，Flint，Mich．－This invention relates to a machine in which two molds are alternately used for forming and press－
ing brick by hand－power，and consists in making three sides of each mold ing brick b
movable．
Button Hole Cutter．－Hermann Hempel，New York City．－This inven－ tion relates to a new device for cutting button holes of different lengths， he knife so as to make the same cut longer or whorter holes，and also in making the knife in one piece，whereby it cannot only be made cheaper，but also easier fastened in the jaw or arm to which it is secured．
Button and Stud Fastener．－J．K．Underhill，Brooklyn，N．Y．－This in－
vention relates to a device by which buttons，studs and other similar articles can be secured to garment 3 ，and consists in the use of two bent arms，ot which one end is pirmeted to the body of the button or stud while the end of he other is hinged in the center of the former arm．The first arm is made of the former passing through the slot in the latter．
Feather Dressing Machine．－Alvah Washburn and J．N．Van Sickle，
Medina，Ohio．－Patent dated June 11，1867．－In this machine the feathers are Medina，Ohio．－Patent dated June 11，1867．－In this machine the feathers are
treated with steam in a horizontal axis．The steam issues in jets into the feathers until they are sufficiently wetted，when it is shut off from the feather hamber，the ventilators are opened and the feathers are dried by the heat or the induction of steam and the eduction of the condensation from the team pipes．
Coltivator．－A．P．Routt，Liberty Mills，Va．－This invention relates to a downward so as to form curved shanks or sheaths to which the slarese either downward so as to form curved shanks or sheaths to which the shares either
of the shovel or plow kind，are attached by means of loops and keys and
which are made tc more securely retain the shoels or which they may be adjusted by having their extremities pointed and bent so as to enter small holes or notches which
plow or shovel as hereinbefore explained．
Wrench．－G．B．Keeler，Portchester，N．Y．－This wrench consists of a straight shank or bar，provided with a suitable hanale at one end and a series
of notches at the other，in combination with an adjustable spring hook，so hung to the said bar as to enable pipes of varying sizes to be grasped． Keel Block．－Joseph T．Parlour，Brooklyn，N．Y．－This keel block is so
onstructed that without necessarily descending into the dock，or pumping he water therefrom，the several blocks，whether one or more，can be ad justed to the proper hights to accommodate the draft of the vessel whether large or
small．
Liniment．－Madame Rachel Newcomb，South Brooklyn，n．Y．－－This lini－ ment is intended as a remed
sprans of all descriptions．
Well Tubes．－J．F．Craig，Eddyville，Iowa．－This invention consists in the attachment to the perforated sides of the well tube of a wire screen or gauze to prevent sand，dirt，etc．，，from entering the well tube through the perfora tions，and thus from being drawn up through the tube to the pump．
Mandfacture of Couplings for Siafts，etc．－Leander Burns，Port－
chester，N．Y．－This invention consists in forming the couplings by striking or waging them from a blank made of one solid piece of metal in a series of dies of pro，
ling．
Napkin Holder．－W．L．Dewey，Bridgeport，Conn．－This holder is ex－ other suitable form for holding the napkin，and a base or pedestal to hold sch ring above and away from the table．
Medioal Compound．－H．G．Pope and H．F．Herrick，New Berlin，N．Y．－－
This compound is for the cure and removal of spavin and other similar com－ plaints in horses．
Governor．－J．W．Shirley and William H．Fasig．Terre Haute，Ind．－This nvention consists in imparting to a horizontal shaft a lateral motion by
Cotton Gin．－Jules Alfred Chaufourier，Paris，France．－Thisinvention re－ lates a to machine in which the cotton is fed to the rolers by the action of
the machine itself，thus dispensing with the manual feed that was heretofore used for the purpose．
Rotary Dovar Dresser．－C．H．Cross，Montpelier，Vt．－The object of his invention is to perform what is technically called by cracker bakers
dressing the dough，＂or brushing off the flour from the surfaceof the sheet dressing the dough，＂or brushing off the flour from the surface of the sheet to be cat up into crackers．
Malatacturina Starch．－－J．J．Gilbert，Little Falls，N．Y．－This invention
MNATAGTURINGSTARCEI．－J．J．Gilbert，Little Falls，N．Y．－This invention
erlates to a new and improved method of manufacturing starch，and to the

## particular manner in which the grain from whic ipulated and operated upon during the process．

Velocipede Sled．－John Bannihr，Hempstead，n．Y．－The nature of this propelling it on ice as a velocipede，the movement being eftected by for worked by the person sitting in the sled，which operate on sharp－toed feet placed in the side wheels，which catch in the ice to propel it torward．
Combination Square．－D．A．B．Bailey，St．Johnsbury，Vt．－This invention
consists in attaching to the ordinary steel square a triangular－shaped frame made to slide upon the square，and to which is attached by a hinge at one en an adjustable face for the square，in
upon the square at any desired angle．
Checiing the Draft of Furnaces．－J．c．Bagnall，St．Louis，Mo－ This invention consists in admitting atmospheric air into the stack or chimney means of a door made in the stack or chimney above the reverberatory line of the furnace，in such a manner that the heat in the furnace can be regulated with the greatest accuracy，the inside brick work of the stack or chimney is saved，and the damper wit
draft，can be dispensed with

## draft，can be dispensed with． Potato PlaNTER．－John P

a intervals，the machine being so arranged and constructed that the plow fo making the furrow can be instantly raised out of the ground，and that th ing corners and other purposes．
Combined Divan and Bed．－Henry Buehler，New York City．－This in adjusted in its various parts to be used as a bed．
Preserving Timber．－H．L．Houghton，Morrison，Ill．－This inventio consists in forming a composition（hereinafter described）by which $I$ am en purpose．
DIsH．－E．L．Bolster，Waterbury，Conn．－This invention relates to a dish
for holding stove polish，and the invention consists in combining with the for holding stove polish，and the invention consists in combining with th blacking across its cutting edge the blacking as it is cut will fall into the dish，from which it can be used in the ordinary manner．This dish is mos

M
Monkey Wrenoh．－Dennis A．Kellogg，Valparaiso，Ind．－This inventio者
－This iners or Wire Cuttina Pincers．－－Peter Broadbooks，Batavia，N．Y． especially adapted to cutting wire．
Stop motion and Requlator．－Charies S．Westlana，Providence，r． －This invention relates to a method of stopping or slackening the motion removed． Jigarina Machine．－William W．Spalding，Greenlana，Mich．－This inven－
tion relates to impores ands in novel ar rangements and devices for washing the ores or copper，lead，silver，an other metals after they have been pulverized in a stamp mill，and separat with them in the ore．
Grain Elevator or Lifter．－William Marcus Jackson，Yolo，Cal．－This invention relates to a new and improved attachment to be applied to reapers for the purpose of elevating lodged graiii and bringing it within the reach of the re
Compass and Caduking Sram Gage．－Geo．Dowling，Hartford，Conn．－ This invention refers to an implement whichis intended to facilitate the whole length determining the width of a caulking seam throughout the work without being compelled to have reeourse to his rule at short intervals or to trust to his eyes．
Extension Horse．－R．Hammill，Mineral Point，Wis．－This invention re lates to a horse or trestle which is used by masons，plastercrs and others for
supporting scaffolds，etc．，and it consists in so constructing the same that it can be raised or lowered，lengthened or shortened，and folded together as may be desired so that it will be adaptable for all purposes，and can be ex－ tended to the very largest dimensions．
Combined Sawing and Mortising．－Henry Hassenpflug，Huntington Pa．－This invention relates to a machine on which a circular saw．a recipro－
cating saw and a chisel can be arranged in such a manner that all wor which can be pertormed on the said instruments can be done on the machine by hand or other power．The invention consists in the mode of applying and regulating the power by which the machine is driven so that the latter
may be used for light and heavy work as may be desired．The invention also conssists in an automatic feed motion，in the manner of securing and ad justing the bed for mortising，and finally in the device for holding the ciprocating saw wherein the chisel for mortising may also be secured． PUMP．－Hiram Parks，Athens，N．Y．－This invention relates to the appa－
ratus for operating pumps，which is such，that a pump can be worked at a ratus for operating pumps，which is such，that
distance of half a mile or more，when desired．
PLow．－Frederick Volkmann，Hoboken，N．J．－This invention consists in the plow beam is secured，in the axle of the plow－ears，so that the uppe frame and sliding－block，for sustaining the upper part of the said screw－ shaft，may be dispensed with．It consists also in making the axle of one
solid piece，and bendidg the draft bar，so that it will pass under the axle and
俍 solid piece，and bendidg the draft bar，so that it will pass under the axle and
not through the same．Also in making ihe attachment of the draft．chain to the plow－beam laterally adjustable，so that it can be regulated in conformity with the wearing of the plow－share．
Coal Oil－lamp Chimnit．－John Belleryeau，Philadelphia，Pa．－This in vention consists in so arranging a metal tube and securing it to the burner by around the narrow strips strips，that a glass chimney mav be placed over and the destructive effects will be exerted on the metal and not on the glass． Butron．－－Joseph M Prugger，New York City．－The object of this inven tion is to construct a button with its fastening seoured to it in such a man will，and may be firmly held thereon．
Cement．－Patrick Kennedy，New York City．－This invention relates to securing door－knobs to the spindles，but which may also be used for other Slejgi Bells．－W．H．Nichols，East Hampton，Conn．－This invention relates to a new manner of attacking the wire or pin，by which sleigh bells are secured to leather straps，and costs in in at once casting the wire into the mould and the bell is then cast around the same，so that the said wires or pins will afterward be securely held．
Device for Clianing the Traps of Water－clobets．－James Wright New York City．－This invention relates to a device for cleaning the curved rod which is inserted in the end of the espe and consists in che use of a fesit rod which is inserted in the end of the pipe，and can accommodate itself to
the shapes of the tube so as to completely clean the same．

## EXTENSION NOTICES．

Bernard Hughes，of Rochester，N．Y．，having petitioned for the extension of hammers，for seven years from the expiration of said patent，which take at the Patent Office on Monday，the 30th day of September next．
Stephen Morse，of Springfield，Mass，，having petitioned for the extension of ment in granted to him on the 6th day of September，1853，for an improve which takes place on the 6th day of September，1867，it is ordered that the which takes place on are at the Patent Offlce on Monday，the 19th day o
said petition be heard
August next．

## gusutts to Currespondents．



J．A．C．，of Ga．，says：Your rule for finding horse－powe as given in your issue of June 1st，page 347 ，in reply to G．B．of Mass．，says
anutiply the area of piston by pressure of pounds per square inch and the product by number of feet traveleed by piston per minute．＂Does it mea
 power depend entirely on the pressure in the boiter？Is
taken asthe
33 taken asthe unit for horse－power？We reply，that the assumption is tha
the pressure on the piston isabout boiler pre：sure Probandy this is neve really so，and in many cases，owing to the distancs of engine fiom bo le and the sinuousity ofconnecting pipes，etc．，the engine pressure is ver much less than the boiler pressure．Horse－power of an engine docs no depend entirely upon boiler pressure．There are other important elemen to be considered．This mode of calculating horse－power is never relie
upon as absolutely correct；itis only an approximation to the truth．Th indicator is the only sufficient test，so far as we know． 33,000 is ge erally received as the unit of horse－power，although 28,000 and 30,000 have been clajmed as nearer the truth．
J．M．，of N．Y．－We know of no rule applicable to all cases to determine the amount of horse－power developed or transmitted by shaft－
ing．The power of belts comprises so many elements that a calculation is exceedingly difficult；strength，position，and mode of running belts vary o greatly as to prevent the establishment of any general rute．The give
J．B．，of N．Y．－If we understand your combination of belts and pulleys we not see any new arrangement．You merely gain power by
the additional adhesion of the combined belts．
R．F．L．，of Miss．，wishes to drive a muley saw by friction． The driving pulley is 12 feet diam．with an 18 －inch face of wood and the pulley on the saw shatt is 30 inch diameter and 18－inch face of iron．The
two are too near for a belt unless a counter shaft is pur up．From the datia furnished we should suppose that sufficient friction might be generated to operate the saw．It might be tried and if not successful the counter shaf could then be hung
J．S．，of Mich．－It could hardly be supposed that railway car wheels would run long with any accuracy if they turned on their axles lik those of an ordinary vehicle．A very little thought and observation wil E．A．B．，of R．I．－＂Foot pounds＂is a term used to denote force，and means simply the energy exerted by a falling weight．One foot quired to raise one pound one foot high in one minute．The unit of hors power， 3 ， J．H．B．，of N．Y．－Homer cannot be accused of nodding in the paragraph you refer to，as a caretul reading will show our assertion
distinctly to be，that much less water will flow through four 1－inch pipes than through one 4 finch pipe

## Busimets and exrsmat． <br> The charge for insertion under thts head is 50 cents a line．

Cotton Factory Wanted at Coloma，Ill．See advertisement and address A．P．Smith，Sterling Ill
r．Lane，Patentee of the Sett Works for Saw－mill Carriage Makers of Washboards－arrange with A．Packham，Prestons ville，Carroll county，Ky．，to manufacture his $\$ 1$ washing macnine．
Petroleum as Fuel Successful at Last－Highly Important－ See notice of patentee in advertising columns，
E．W．Hunt wants Wood－working Machinery and Steam
Engine－See advertisement．

## NEW PUBLICATIONS．

The Mechanism and Constructor for Engineers，by Cameron Knight．Part V has just been received；also Bourne＇s Treatise on the Screw Propeller，Par
XX，for May． We have before given warm commendation of both these publications
The former is a valuable assistant to the forger and machinist as well as to the Engineer，and the latter interesting to builders of marine engines．
The Modern Carpenter and Builder．New and Origi and Hand－Railing，by Robert Riddle，Author of＂Ele AND HAND－RALLING，by，Robert Riddle，Author of＂Ele
ments of Hand－Railing．＂D．Appleton \＆Co．， 443 Broad way，New York．
This treatise ss a by fourteen plates．The explanations are full and easily comprehended，an he diagrams plain．Prac
Tables for Qualitative Chemical Analysis，by Prof
Heinrich Will，of Giessen，Germany．Seventh Edition Translated by Charles F．Himes，Ph．V．，Professor of Natural Science，Dickinson College，Carlisle，Pa．Pub－
lished by Henry Carey Baird，Industrial Publisher， 406 Walnut Street，Philadelphia．
These Tables（there are eleven of them）exhibit in a compact form the tsts and reactions of a large number of chemical substances．They ar

Inventions Patented in England by American
PROVISIONAL PROTECTION FOR SIX MONTHS．
1，067．－Hammer．－Geo．Selsor and Wm．Cook，Philadelphia，Pa．April 10
1，1199－－Siome For Horses and Cattle．－Henry F．Shearman．Elizabeth，N．

 Hisi－
 1，203．－STEAM Enaine．－Fred．W．Gordon，Cincinnati，O．April 25， 1867.

 April 29，1867．
1，236．－Bobsin．－Frederick W．Northrop，New Haven，and Ezra S．Munson
Vorth Haven，Conn．April 29，1867．
1，250．－Combinep TAPER Holder $\triangle$ ND Match Box．－John A．Wbipple，Bos
ton，Mass．April 30 ， 1867 ．



## the steam ram and floating battery dunderberg, recently sold to the french government.

the dunderberg.
The new proprietors of this magnificent ship-of which we pre sent herewith a handsome engraving-were treated on the 13th to eshibition of her steaming qualities, after a full overhauling of
her machinery. She was tried tour times on the measured nautic her machinery. She was tried four times on the measured nautical
mile ( 6,085 feet) $t$ twice with and twice against the tide, making the four miles in 18 min ., 32 sec .-an average of one mile in 4 min ., 3 ece., or about 13 knots an hour, at an average of perhaps 22 lbs. steam pressure. With 25 lbs. at starting, the screw would make as many
as 58 revolutions, but it was impossible to sustain the pressure as the fires had become fouled by standing open the most of the day while adjusting the machinery. She was put about in 3 minute 14 seconds. The guns, which are U. S. property, were forbidden to
We published a full and accurate description of the Dunderberg
on page 173 of the present volume, to which our readers will find it $\mid$ be constructed. The intention was the construction of a ship which $\mid$ ships having armared sides are not unknown nor untried. The New interesting to refer in connection with the accompanying pictorial might be used either as a floating battery, a ram, or, if necessity re- Tronsides has tested her strength against shore batteries. The Dum her. Whe figures therein given differ somewhat from those which quired, a cruiser, capable of carrying coal sufficient for a voyage, derberg, while not professing to take the place of the monitors, is a Erastus W. Smith, A. P. D., the designer of the machinery; conditions are fulfilled in the Dunderberg cannot be successfully dis- strictest rules of the ship-building art, and calculated as well for the Messrs. John Roach \& Son, the builders, and Mr. Wm. H. Webb, the puted. If she is not as fast as some smaller vessels, her great weight shock of the seas as the opposition of hostile batteries. construct
may be.
The $D$
y be. wiser she was never intended. She also a floating battery. As a cruiser she was never intended. She is specially designed for coast any craft afloat.
It never was pretended by those who lad charge of her construc- $\begin{aligned} & \text { their tunnage, in the use of coal and oil as the Dunderberg. She studied its construction and noted its defects. That the Dunderber }\end{aligned}$ ion that she was entirely


Cormyyyrio
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NOTIGE TO SUBSCRIBERS.
To save several pages of room, which the pictorial title page and index we usually print in the last number of each volume would occupy, we shall print at this time an edition of an illustrated frontispiece and index separately.
Those who wish to preserve the work can be supplied gratituously with this sheet to bind with their volume on application to this oflice either in person or by mail, or through any dealers who supply the paper.

## MODELS AND MONEY BY EXPRESS

Parties should never inclose money in the box with their models. Express companies are not liable for the loss of money thus sent. It should be forwarded in a separate parcel and a separate receipt taken. It is safer to inclose currency in a letter by mail than to place it inside the box. The name and residence of the inventor should be attached to every model ; and in sending money by express, a note should accompany it stating who it is from and the purpose for which it is sent. The name of the sender should also be written on the outside of the envelope. The best ways to make remittances by mail are by draft on New York, payable to order of Munn \& Co., or by postal order ; or currency by Express in an envelope separate from the model.
An owner is wanted for a draft for $\$ 16$ from Baraboo, Stark county, Wis.; and for $\$ 32$ currency from Oconomowock, Waukesha county, Wis. The senders of these amounts will please write to this office and inform us the object of their remittance.

## THE SCIENTIFIC AMERICAN---A NEW VOLUME.

This number closes Vol. XVI of the Scientific American. It is probably unnecessary to recapitulate the peculiar features of this journal to our regular readers, but to others, who only occasionally see the paper, we wish to say a few words. Although not in the general sense a newos paper, and in no sense a partisan paper, the Scientific American'makes a weekly exhibit of the novelties in art and science, notices all useful improvements, new inventions, and discoveries. It aims to encourage honest endeavor and the inventive talent of the country and the world, by generous mention and judicious counsel. At the same time it will not hesitate to expose charlatanism and unwarranted pretention, thus protecting its readers from the imposition of mechanical and scientific quacks.
To the mechanics and scientists of the country, to all seekers after practical knowledge, our columns are always open. Their communications are received, read, and if of general interest, published. We intend to give all a fair hearing and a courteous consideration. If we ever fail in doing so at the time expected, it must be attributed to the limits of our columns and not to intentional neglect.
Our "Answers to Correspondents" are made by two editors both practical men, one in the domain of science and the other in mechanics. This department, alone, is worth much more than the subscription price of the paper. It contains an amount of really valuable information not to be found in volumes of " manuals," "encyclopedias," or other ostensibly scientific and mechanical works.
Our "correspondence" embodies the ideas of progressive men in all parts of the world, giving our readers an opportunity of communicating with each other and the great world on subjects affecting the advancement of science and the mand
The illustrations of new inventions are of inestimable value to the mechanic, the farmer, and the business man. The engravings are not surpassed in accuracy, and quality of arv
tistic execution by any others, and the descriptions, by a The whanc and ligerous and valuable to all classes. It is furnished officially, express and valuable to all classes. It is furnished officially, express ly for this journal, at an expense of several thou
a year, and may be depended upon for accuracy.

Editorially the Scientific American will continue to be instructive and interesting. Fearless in the exposure of humbugs, alive to the progressive tendencies of the age, and just to all the improvers of the race, it will as heretofore strive to embody truth with talent and conservatism in principle with progress in practice.

## THE PENDULUM IN ITS VARIED APPLICATIONS

The prize which the genius of Galileo gave the world has proved more of an acquisition than he could have anticipated. The discovery of the isochronous vibrations of the lamp suspended from the Pisa cathedral, was not merely accidental. It was one of the most familiar sights, but the inquiring mind of the choir boy detected what probably no one before him had done, that while the extent of the arcs steadily diminished, the vibrations were completed in the same time. The principle appeared to him important and he caused it to be employed by physicians in counting the pulses of their patients.
Unquestionably the most useful application of the pendulum ever made, and one which early suggested itself, was in the measurement of time. Aside from this other applications of a scientific character have been devised, and an enumeration of some of the more important ones is the pur pose of this article.
Dependent upon gravity for its motion, the pendulum has been of use in demonstrating anew the grand law pro pounded by Galileo, that gravity acts independently of the mass. This verification was made first by Newton who using
a hollow sphere as a pendulum ball, filled it successively with a hollow sphere as a pendulum ball, filled it successively with
feathers, liquids, metals, and ivory, finding that however the feathers, liquids, metals, and ivory, finding that however the
substances varied in density, in every case the same time was substances varied in density, in every case the same time was
required to complete the oscillations. As the rapidity of the oscillations increases with the increase of the force that at every swing attracts it downward, by accurately noting the difference in pendulum vibrations at the surface and below it, the measure of the relative intensity of gravitation may be es timated, and consequently the form as well as the density o the earth determined.
Few incidents of scientificinterest have ever excited more general interest than the experiment devised by M. Foucault of Paris, in 1851, for demonstrating the rotation of the earth of Paris, in 1851, for demonstrating the rotation of the earth
by means of a pendulum and making this rotation visible to the eye of an observer. His mode of procedure was as follows From the center of the dome of the Pantheon was hung a fine wire 210 feet long, terminated by a heavy ball, the whole swinging freely as a pendulum. Beneath the ball was placed a round table. Now it can be shown by the principles of mechanics, that a pendulum once in motion, will not change the direction of its oscillation, however the point of support may be rotated, so that in this case the diurnal revolution of the earth will not affect the plane of vibration, but the latter will maintain strictly the same direction during the twenty four hours. In this interval, however, the table, in consequence of this diurnal motion, will continually change its position so as to make a complete revolution around its center. As a consequence it will soon be found that the ball of the pendutum never returns precisely to the same starting point after two successive vibrations, and a line marked by a projecting point of the ball upon the table, will show the earth's rotation. I the experiment were tried at either pole, a complete apparen revolution would be seen every twenty-four hours. At the
equator, on the other hand, the plane of vibration is carried equator, on the other hand, the plane of vibration is carried
forward by the revolution of the earth and so undergoes no change with reference to the meridians. Between these lo calities the time required to complete the rotation varins with the latitude, being greater as we recede from the poles.
In establishing a universal standard of measures, some nat ural unit needs to be selected. The space travelled over by light in the ten-millionth part of a second, has been proposed fion of a tion of a ray of light of some definite refrangibility has also plied a million fold to furnish a suitable unit. The linear diplied a million fold to furnish a suitable unit. The linear di-
mensions of the earth, and the linear measure of its attraction embodied in the pendulum, are the only available sources of invariable and universal standard length, and were acknowledged as such by the members of the French Academy previ ous to the adoption of their present decimal system. They hesitated for a time which of these to accept, and it is to be regretted that final choice was made of the former, taking
the ten-millionth part of the quadrant of a meridian as a metthe ten-millionth part of the quadrant of a meridian as a met rical unit. This measurement afterward proving incorrect, sought to avoid, an arbitrary unit. As if admitting an unwise decision, the Commissioners, in their report recommending the metrical system, were careful to insert this provision that in the event of the loss or destruction of all material representatives of the metre its value might be recovered from a specified relation existing between its length and that of the pendulum vibrating seconds at Paris. The English Parliament in 1824 made a similar proviso for restoring the
standard yard should it be lost, defaced, or otherwise injured, enacting that in this case a new standard should be constructed bearing the same proportion to a seconds pendulum vibrating seconds of mean time in a vacuum at London and at the
level of the sea. as 36 inches bears to $39 \cdot 1393$ inches, the length of the seconds pendulum at London. The failure of the attempt to put in force this enactment in 1834, after the
destruction by fire of the Parliament buildings and the standard yard with it, was owing to an inaccuracy in the previous measurement of what was to become the basis of their calculation, viz., the pendulum, and a new standard was finally made from a careful comparison of the most accurate and best authenticated copies of the old standard yard. This failure of course argues nothing against the employment of the pendulum in the capacity of a linear measurer, and it is quite certain that should any system of measures universall accepted by civilized nations, be formed, the pendulum would at once be looked to as furnishing the proper standard, being imperishable, invariable, and capable of identical reproduction.

## AN ANSWER TO THREE INQUIRERS

We have before us three letters of inquiry from three young men asking advice on the same subject. As there may be many more in search of similar information, we pro pose to reply through our columns instead of by mail, giving briefly what information we may, drawn not from observa on alone, but from a somewhat rough personal experience. W. J. of N. Y. says he is a "poor boy without means and desires to become a mechanical engineer." He wants to know the "proper course to take, and the studies to be pur ued."
J. N. of Pa. is an "apprentice in a machine shop; has served two years and has three more to serve." He thinks he "could accomplish a great deal in that time and is determined to do all he can; wants to know what studies to take first has books on philosophy, arithmetic, geometry, algebra, etc and desires advice to assist him."
E. A. B. of R. I. has "recently finished his apprenticeship in a machine shop ; wishes to learn more;" asks " what stuü es he shall pursue to become a mechanical engineer, as he has to depend entirely upon himself."
Here we have an untaught boy, an apprentice to the ma hinist's business, and one just out of his apprenticeship The three positions probably represent a very large propor tion of our young male readers; so what we may advise may be of as much use to others as to the inquirers themselves
First, then, to become a mechanical engineer involves be coming a practical mechanic, a workman. To be this re quires a patient apprenticeship to the machinist's busines and a constant effort during the time to become master of the tools used and the processes employed. We do not propose to discuss the duties of the apprentice; these are taught in the shop. Obedience to orders, application to work, a deter mination to do whatever work is given in the right way and well, and an endeavor to understand what he is doing, are among the requisites of the intelligent and progressive ap prentice. Now, the intellectual preparation for the busines of the mechanical engineer can be made during the appren ticeship and both this and the mechanical dexterity can be mproved vastly after the period of novitiate is finished. The evenings of the apprentice and the workman are their own Let them be used.
A knowledge of arithmetic is indispensable. It must be thorough. The good mechanic ought to be a good arithme tician. By this term we comprehend a knowledge of algebra and some acquaintance with the higher branches of mathe matics. Grammar is not to be despised. The engineer must often be required to state in writing, as well as verbally, his reasons for a process or a combination of devices, and to ex plain his own ideas so that others may comprehend them. It detracts much from the influence of an engineer or a mechan if he is not able to put his ideas into presentable language Natural philosophy is a desirable study. Indeed some departments are absolutely necessary to the mechanic's success. Geometry and the practice of mechanical drawing are essen tial to the engineer, if he expects to be able to direct and control as well as to obey and perform. Among the book especially intended for the mechanical engineer may be enu merated a number of the manuals or hand books published from time to time, as Scribners, Molesworth's, and others Then there are Bourne's Hand book of the Steam Engine Byrne's Practical Metal Worker's Assistant, Bourne's Cate chism of the Steam Engine, Burgh's Land and Marine Engines and Boilers, Morin's Mechanics, Bartlett's Mechanics, Williams on Heat and Steam, and many others which may be studied with profit and interest after the requisite knowledge of arithmetic, language, and natural philosophy has been obtained.

After all, however, more depends upon the energy and de termination of the apprentice than upon these aids. One may have all these and more and yet from want of pluck and persistence remain forever in a subordinate position.
An Underhung Railroad Car has been proposed before the Institution of Engineers in Scotland, with a view to ad mit the use of larger wheels, and to diminish the lateral ac tion by lowering the center of gravity. Not to speak of the increased weight in proportion to capacity, the intolerable ggravation of the dust nuisance, and the instantaneous and nevitable destruction of any car run off the track, interpose peremptory veto in advance of any change in this direction.
Preservation of Milk.-It is stated that dairywomen have discovered, but philosophers have not explained the
reason, that milk suddenly cooled after being drawn from the reason, that milk suddenly cooled after being drawn from the cow will keep much longer than otherwise. The cheap, artificial methods of reducing temperature in three or four min utes to any desired point, may yet find a general and very useful application in milk dairies, although its effect upon the production of butter is questionable.
The Strawberry exbibition of the American Institute has been postponed one week ; that is, until'Tuesday and Wednes. day eyenings, the 25 th and 26 th instant.

## (6)

ISSUUED FROM THE U.S. PATENT OFFICE


Patents ard eranted for seventeen fears, the followid On fling eadule of fees:-




On filing application for Design (seven years)...
On filung application for Desirn (fourteen years)
In addition to which there are
Canada and Nova Scotia pay $\$ 500$ on application.


65,525.-Ladder.-P. M. Ackerman, Webster, N. Y
First, I claim the combination of the ladders, A and d, the latter being pro.
anded with the tlat windlass, H , and having the rove, b, arranged as shown
and descrihed.

 65,526.-Frie Alarm.-W. W. Andrews, J. Cummer, J. F.

 65,527- - BotTLLE Pump.-George Asmus, Houghton. Mich.
I claim a bottle pump, constructed and arranged substantially as described I'claim a bottle pump, constructed and arranged substantially as described 65,528.-Mopand Brosu
First, I claim the frame, B, provided with the head, B' fingers, b, arms,
 65,529.-Plow.-Ephraim Ball, Jr. Canton, Ohio
First. I claim so condcting a metal, plow beam, that the parts that are
attached thereto can he made cither of cast iron or steel, or of both, substan-
tially in the manner herein secified


 ions with the profections, , on the land sides, $K$ and $M$, substantially in the
manner and
Sixth. Sixth, The attachment of the cutter, P, to the east iron plow beam, A , in
therooves.a. a. in said eanin the maner herein speoifined
seventh, The L-shaped block, G , in cast iron point, when said point is used
 65,530.-Lubricator for

## Bancroft, Hopedale, Mass

 65,531.-Skate.-E. H. Barney and John Berry, Springfield, $\underset{\text { Mirst we }}{\text { Mass. }}$

 Solomon E. Bickford and Frederick Flanders, Franklin, N. H. with its inn ner and onter scales, and the blade, B, with its indicators, e, con,
neceted by the serevpin, h, hnn nut, C , or their equivalents, arranged and
operating substantialy as set forth. 65,533-Manufacture of
 Wrody fiber, as both herein specitited, bv means of compression into molds
or forma herein mentioned and described.
Iclaim compression as above andy for the specific purpose of securing to
 cork-like elasticity and for giving them certain definite artistic shapes.
05,534 .- Apple Paring, Coring, and Slicing Machine.-
A. McR. Blain, Decrfield, Va.
irst, I claim the coring blade, L, shatt, M, clutch pulley, N, and ben

 65,535. - Boot Blacking. - Alaxandr Boudrou, Philadelphia, Pa.
claim the compos
Y claim the compositions componsed of the ingredients named, for blacking
leather boots and other articles of oleather, stoves and othler articles of iron,
and for coloring polished icher 65,536.-Steam Engine.-R. Brayton, S. Curtis and David First, We, Fremont, Ohio.
 pose and in the mannor as herein descrihed.
Seconn, The link. K, rock shaft, , , and link, e, as arranged in combination
with the can, id yoke, manner set forth.

## 65,537-BotTLE ST Milwaukie, Wis.

First. I Iclaim the bettle, A. tube, B. and coupling, C, in combination, sub-
stantiall acond for the

65,538.- Furnace For Desuliph
bim to


65,539.-Water Wreel.- E. G. Budd, Budd's Lake, N. J


## 6.5,540--Railway Chaim.--Samuel S. Burt, Marquette, Mich. Mich.



 65,541 - Wagan Axine Tree. - Cornelius L. Campbell, Binghampton, N. Y
 6 s.542-M $\mathrm{MrTrowoms}$. -Herry C Carden, Paris, France.
 65.53.- Boor JAcrz- - Cyrus Clay, Scranton, Pa.
 65,544-T Turning Curve oir Raluroads.-George Collyer, Philidalelpiaia, Pa.
 65,545.-SEASoNIING AND PRESBrvTING WooD. S . Constant. Peekskill, John Smith, Brooklyn,
March
IV
1887 March 17 , 1867

 65,546,-Machine for Drarining Sucar--Giram A. Cop-


 65,547- Feren Wa Ter Heater. - William Crighton, William




 65,549.-Attaching Draft to Vemicles. - G. S. Curtis (assignor to himself and Ellis G. L. Faxon), Chicago, Ill.
claim the combination of the ordinary whitletree, M. and pole, A, with
 when all are cons
herein described
65,550--W RENCH.-William P. Dunlap, Maquoketa, Iowa.
I claim a wrench constructed substantially as and tor the purpose se 65,551.-Meat CuTTER.-Daniel S. Early, Hummelstown, Pa
 substantiaily as described and re
$65,552,65,553$.-Canceled.
65,554.-Stove Pipe 1 Rum .-Adam Ernst, Milwaukee Wis.
I claim the herein described heating apparatus, the same consisting of
drum or radiator capable of being applite to atove orpipe of ordinary con
struction and provided with fues arranged substantially in the manner and for the nurposes herein shownand dascribed. of the inner or direct smoke
seceon. The combination and arranement
fie and annular air chamber surrounding the sa me with the onter lielical
 65,555.-CHANGE Box.-James B. Eurtis, New Orleans, La.

 65,556.-Bed Botтом.-J. S. Farrington, Milwaukee, W is. Tclaim top and bottom frame, E, with bell shaped openings with rubber, B
giude rod. A, and pins. D. all combined and arranged substantially as and
forthe parnon descibed
65,557.-Tool for Cutting Wire.-William H. Flinn (asSignor to himself and James N. Kendall), Nashua, N. H
I claim mv improved wire or rod cutter made as described, viz: with each
 65,558.-Mop Wrinamr-Charles W. Gage and James Nor 65,558.-MOP WRINGER
thrup, Homer, N. Y


 Third, The em ollovment of the C, springs. H. as herein shown and the
metho for rexulating the pressure, substantialiy as set forth and for the
purpose described. 65,559.-Ice Cream Freezer.-Charles Gooch, Cincinnati Ohio.
 65,560.-LAST Lock - Dennis Goodyear, Ithaca, N. Y

 whon the locking is done by the cam-like action of the pin or plug as de 65,561.-Bolit-iteading Macifine.--S. W. Goodyear and W.



65,562.-Joner's Plane.-Arthur Grav. Naples, Me
Ic'ai in the enmbination of protection, c, on the hack iron with the staple,
k. and thumb screw, m, on the clamp, when arranged as and for the purposes
set torth.
65,563.-Metatilic Compound or Alloy.-Julius Hackert
New York City.
mixed together, substantially in the manner and about in the proportions se
Also the addition of s altneter and cream of tartar to a compound of coppe
and zinc, substantially as and for the purposes described.
65,564 .-Still.-George Hadley, Buffalo, N. Y
I Claim, First, A series of jackets of graduated temperature applied to
the pine of a stil to eliminate by sunccessive stages a fluid of given tenuity

65,565. - Machine for Making Cordage. - James Hall,
Monroe Township. N. Y
 65,566.-Door Hoinmer.-John J. Harris and Isaac H. MoshI claim as a new article
es specified. himself and J. F. Lyman), Utica, N. Y. F .
 purposesmentioned.
second, The combination of the said dies and guides and the set screw,
purponstres meted and operationed.

65,568.-Lathe for Turning Wood.-Horace R. Hawkins, Akron, Ohio
 with a combined gather and ptich, in the manner herein shown and specifl
65,569 .-Lifting JAck. -Azro Healy, Kalamazoo, Mich.


 65,570--Well Tube-A. E. Heberd, Homer, N. Y

1. claim the eombination of the auger, D, secured to the tube, C , by bolt, F ,
can, A, anvil,, bar, G , with the tube, all constructed, arranged and operated
as described.
65.571.-Feed Cutter.-Henry Helm, Pittsburgh, Pa
65.571.-FEED CUTTER.-Henry Helm, Pittsburgh, Pa.
First, © claim the rotary eccentric knife, , provided with slots, h h, in
combinati a with the knife block, f, substantially as and for the purposes
 65,572.-W Wter Wheed - G. Wm. Holden (assignor to himself and James P. Upham), Claremont, N. H.
I claim, Fir st, The guides,, , applied at the backs of the
water whell, substantrally as and for the purposes specified
 the buckets, substantially asand for the parposes set forth.
Third, Iclaim the curved lower edgen, no the bucket in combination
with the guite, mububtatialy an and for the turposes specified.
Fourth, I claim the movable curved



 65,573.-Horse Rake.-James Hollingsworth (assignor to J. M. Wanzer), Chicago, Ill.
First, I claim the construction of a

First, 1 claim the construction of a rake tooth bearing, J, with three
passages atrint angesto each other when said bearing, are of tor to
abut directly ha
anainst one another and the teeth extend clear through the top passage of the bearing, substantially in the manner and for the purposes
described.

 65,574.-CAR SPRING.-Edwin J. Horner, Wimington, Del
 having a vertical rib, d, whereby they are alone secured in their proper
places and held by the pressure of a grooved blocz, B, in the manner asherein
65,575.-Lozenge Machine.-John S. Howell and Charles
W. Carter, Portsmouth, N. H. ..
 65,576.-Winding Tatting Shuttile.-H. P. Jones, Daven port, Iowa.
 65,577.-Post-hole Auger.-John Killgore, G. D. Clapsaddle and Edward Snart, Arcola, Ill.
We claim the arrangement of the sleeve, , , a, and its pin, K , with the shaft
f, frame, B , and band, $G$, substantially as and for the purpose herein speci-
fied.
65,578.-Corn Dropper.-Robert P. Killin, Canton, Ohio,

 65,579.-Method of Making Side Bands of Watch Cases

George W. Ladd (assignor to John A. Brown), Provi
dence, R. I. I claim the method of constructing the eide band for
tially as herein described for the purposes specified.
65,580.-Medical Preparation.-Charles L. Lege, San Antonio, Texas.
claim the invention
Itce and a medicinal remedy against the scurvy, as hereln described. 65,581.-Method of Casting Tweers.-William P. Lewis

Pittsburgh, Pa., assignor to himself and Wm. H. Sims.
 65,582 -Safety Guard for Railway Cars.-Samuel Males, Cincinnati, Ohio.
First, I claim the adjustable guard made in sections encasing the wheels substantially a a and for the parpose set forth. catch, lin ks, bolts, nuts and
specond, The arrangement of ratchet bow.
spring which admit of the perpendicular adjustment of the guard, substan
tially as described. 65,583.-Ротатo Digger.-George Meader, Prairie Centre, Ill.
 65,584.- Mor Head.-Gcorge Meader, Prairie Centre, Ill lelaim the combination of the handle, A, plate,B, ja w, C, and latch, D. all
arraned and operating substantially in the manner and for the purposes
specified. 65,585.-Bremch-ionading Fire-Arm.-Isaac M. Millbank, First. Greenfield Hill, Conn

 drical Dortion at x , as set forth.
65,586.-Fibrnace for Reducing Metallic Ores.-Eugene Wm. Nohl, Ripon. Wis., assignor to himself and Edward First, I claim a furnace provi


 furnace, for burn a ng the ge ge
for the purp ose specifed.
65,587.-Brace for Supporting Thrashing Machines.I claim the combination of bed, A, brace,
abstantially as set forth.
65,588.-Self-adjustina Wrench.-A. M. Olds, New York
City. Antedated May 27, 1867
65,589.-Pliers.-A. M. Olds, New York City. Antedated May 27, 1867.

65,590 - Machine for Making Paper Tubes.--James
Olney, Providence, R. I the arrangement of the endless pasting


disclarger being provided with mechanism for operating them substantially
as described.

 65,591.-Gate.-Calvin H. Paine (assignor to himself and Wm. D. Milton), Providence, R. I. I claim the combination or the chamber co posts, or their equivalents and
the folidingate made of the crosed bars connected as described.
I also claim the combination of the chambered
 65,592-FENCe.-Calvin H. Paine (assignor to himself and Wm. D. Hilton), Providence, R. I. I claim the fence as made with the lazy tongs, or folding section or body
arranged and combinede either with grooved posts or the same and rails, sub
stantally as epecified. stantin.
65,593-Apparatus for Amalgamating and Collecting
Gold and Silver from Ores.-Wm. P Parrott and
J. Bordman, Boston, Mass.
 sorapers, or their eq uivalents, for removing the amaligam riom the tho surface
or surfaces of such roller or rollers, the whole being substantialy as de
scribed.
 betwen that two rollers and guide the mercury trough so as to extend up
are in revolution, the same being asthibited in thig bite while they
We also claim the combination of the heating



 65,594.-Blast Apparatus for Carbureters.-F. S. Pease Buffalo, N. Y.

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65,595.-
65,595.-Blast Apparatus for Carbureters.-F. S. Pease

 65,596.-Shirt Bosom.-George B. Perkins (assignor to Bur lock Manufacturing Company), Bridgeport, Conn
 ing, all substan
60,597.-Construction of Pots for Charring or Burning Bow in the construction of pots for unae as d described, the division of the
toms of the pot int parts, separated from each other by slots, constructed 65,598.-HARDENING SAWs.-Edwin S. Piper (assignor to 65,598.-Hardening Saws.-Edwin S. Piper (assignor
himself and Atkins and Company), Indianapolis, Ind.

 described. Hot-biAAT STove--John Player, Norton, England I claim the constructing and arranging of a hot-blast stove to be used with
coal or solid fuel, with three distinct chambers, in the manner herein de
 65,600.-Apparatus for Heating the Blast for Furnaces
used in Smelting Iron, etc.-John Player, Norton
 65,601.-Hinge.-Jay W. Powers, Evanston, Ill. Antedated
May 28, 1867.
I claim the cam. D, applied to a triplicate hinge, constructed and operating
substantially as and for the purposes herein set forth.
65,602.-Car Coupling.-Stephen Puffer, Oxford, N. Y

 either bumper of a railwav car, and with a swinging
stantially in the manner and for the purposes set forth.
65,603 .-FERRULE FOR STOPPN
65,603.-Ferrule for Stopping Leaks in Boiler Tubes.

- Patrick Quinn, South Newmarket, N. H. - Patrick Quinn, South Newmarket, N. H.

Y claim the gland and the expander as made ont onty. with the male and fe fe
male scress, and with either or both tapering. as specitite, but as having a
keyhole formed in the bore of the expander, 65,604.-Forming Projections on the Caps of Plane ,604.-FORMING ProJECTIONS ON THE CAPS
IRONS.-N. B. Reynolds, Auburn. N. Y.
claim the method of construction substantially as described,
65,605.-Snow Plow.-Samuel Richards, Philadelphia, Pa. I claim the combination of the inclined plane, A A, ati the movable
wedge block, $\mathbf{B}$, and the pivoted flap, $\mathbf{c}$, arranged and operating substantially 65,606.-LET-OFF FOR Looms.-George Richardson, Lowell Mass.

 65,607.-Breech-Loading Fire-Arm.-B. S. Roberts, United



 Robertson, Plymouth, Ind.
I claim the pulley block. F. when constructed and arranged substantially
as and for the purpose set forth. 65,609.-Lubricator.-Robert Ross and B. E. Lehman, Bethlehem, Pa.
 the purpose herein set forth. of the above and the hollow spindle, D, its vent
second. The combination of
 Fourth, The retachable annular strainer, H. Constructed and combined
with the ring, C , spindle, D , and spring, I , as described. 65,610.-Seeding Machine and Fertilizer.-A. P. Routt, Liberty Mills. Va.

 65,611.-Scuttle Door for Buildings. Dry Docks, and 65,611.-SCUTTLIE DOOR FOR BUILDINGS. D
V I claims the combination and arrangement of a scuttle do
more fire safety openings, d, and conducting and distributing, hose or pipes,
dad d dut, with decks, ropes, etc., substantially in the manner and for the pur-
poses herein set torth. 65,612.-Brick Machine.-Henry C. Sergeant, Columbus, $\underset{\text { First. I claim }}{\text { Ohio }}$
 Ing of the corners of the molds.
Second, claim the adiustable striker plate, having a bolt or slot for clamp.

 65,613.-Brick Machine.-Henry C. Sergeant, Columbus, Ohio.
 mold wheel for raising or dropping a weight upon the face of the brick to
finishing,
Third shom 1 and described
 65,614.-Cover for Gridirons.-Reuben Shaler, Madison Conn.
I claim ac over having an op ening, C , and protected from below by a plate
D, substantially as and for the purpose specited. 65,615.-Button-lacing Hook.-Wiltiam H. Shurtleff, Prov idence, R. I. Antedated May $9,1867$.
First, I claim making a button hook in which the hook is within the peri-
phery of and ecentric to the bottom of tow, separate and distinct, united
to eet her at or near the center of the button, substantialy as herein shown
 in which the button in made of horn, hoof, rubber, or other 1 lie e matier ial, and
the hook of metal, the two being
ner herein shown and described.
65,616.-Plate Lifter.-Daniel M. Skinner, Sandwich

65,617. - Cap For Upholsterer's Springs. - Ambrose
65,617. - CAP FOR UpHO
Tower, New York City

65,618.-Tart Cutter.-John H. Treadwell, Swampscott, Mass.
claim the
anged as specifled.
Ialso colain tine combination of the handle,
arro , arraned as specified, the said box being provided or not with air lholes a
described. $\underset{\text { First, I claim the combination of the slotted plate,A, slotted }}{\text { 65, }}$
 or the purpose set forth.
65,620.-Churn.-Aaron Votaw, New Garden, Ohio
Iclaim the arrangement of the breakers, E, and ribs, Hi, In in combination
with the case., $\begin{aligned} & \text { when operated in the manner and for the purpose, substan } \\ & \text { tially as set forth. }\end{aligned}$
65,621.-Lamp for Burning off Paint.-William W Wakeman, Jr., New York City. First, I claim the reservoir, A, placed over the lamp, L, substantially a
and tor the the
S. tially as herein deseribed.
otbird, Theinderendent lamp, L. operating substantially as and for the pur
pose herein specifed. 65,622.-Wagon Axle and Box.-John N. and Theodor
Wallis, Fleming, N. Y. Wallis, Fleming, N. Y.
 eciiied 65,623.- Churn.-Chauncey E. Warner, Syracuse, N. Y. First, I claim the hinged beaters, e f, in combination with the shatts, BC
and gears, b D , all constructed and operating as and for the purpose herei
shown and described shecond, Incscrnection with the above, I claim also the sliding hab, m, for
adjustint onper beat beaters to varying quantities of cream, as and for the
purpose set forth. 65,624.-Foot Scraper. - James Whait, Springfield, Mo. I' claim the hinged hollow sides, D D, in combination with the scraper, B 65,625.-Water Anchor.-Norman W. Wheeler, Brooklyn


 65,626.-Dish Cover.-William H. White, Kent Island, Mcl assignor to himself and George W. White.
 65,627.-Quilting Frame.-Aaron S. Winner, Clark Co. I clail.
I claim the construction of the self-supporting trestles or benches witb the
gains, in combmantion with the wheels and catches, arranged in the manne and for the purpose described
65,628.-Paper Reel for Telegrapilic Register.-Lewi
W. Worth, Sonoma, Cal
I claim the rails, $B$ C, adjustable drum, $F$, with ratchet, $P$, pawl. R, and
spring,
set forth, with cord,, , arm weight, $W$, for the purpose herein specilied as
65,629.-Beehive.-William J. Andrews, Columbia, Tenn. First, I claim the semicircular piecee, F F, the movable covers or caps., ,
G, and the apright bar, $H$, when used in the manner and for the purpose as
herein specine herein specitided.
hocon the moth itra, K , when it is provided with the grated
cover, 1 and feeding trough, L , arranged in the manner and for the purpose 65,630.-Checkivg the Draft in Furnaces.-Jonas C Bognall, St. Louis, Mo.
I clace ane arrargement or a door, b, in the smoke stack of a reverberatory
furnace and above the reverberatory line thereof, substantially as and for
the purpose described 65,631.-COMbination Square.-D. A. B. Bailey, St Johns-
burg, Vt. burg, Vt .

forth. $632 .-B a g$ Fastener or Tie.-D. B. Baker, Rollersville Ohio.
I claim the metallic clasp, for bags, constracted as described, consisting o
the semicircular parts,
one
 65,633.-Velocipede Sled.—John Bannihr, Hempstead, In. Y. . claws, n, pivoted on wheel, C, on each side of a sled, in complin
ation withe the levers, D, ortherir equivalent, for rotating the wheels, con
structed and operating substantially as herein set forth. 65,634.- Hose CARriateen.-N. S. Bean, Manchester, N. H.


 Fosctribed. In ombination with the reel the fuel boxes arranged on each side
Fond
thereof, and under the frame or each box, having a discharge opening and
gate in in its botton substantially as set torth. 65,635.- Brick Press.-Christopher Becker. Flint, Mich.


65,636.-Corset.-Myron H. Beckworth, Camden, N. Y. I claim a belt aplied over and upon the seam around the waist part of the
corsets, substantally as and for the purposes set forth.
$65,63 \%$.-BLACKING DISH AND KNIFE.-E. L. Bolster, Water-
 Y claim a dish providen
for the purpose described. 65,638.--Wire Cutting Pincers.-Peter Breadbooks, Bata

 65,639.-Metallic Surface Coating Composition.-G Brown, E. E. Burnham, and J. Morrise, Gloucester, Mass
 65,640.-DIVAN A
Tclaim-Divan and Bed.-Henry Buehler, New York City. Io be used and adjusted substantially as described for the purposes specified. 65,641--Dies For forming Thill Couplings.-L. Burns,
(assignor to himself and Joseph Wilcox,) Portchester, (assignor to himself and Joseph Wilcox, ) Portchester,
N. Y.

 65,642.-Method of forming Wheels, Tires \&c., by Cast-INGs.-William Butcher, Jr., Sheffield Eng., Thomas
Shaw, Philadelphia, Pa.

 65,643.-Cotron Gin.-Jules Alfred Chaufourier, Paris, France.
First, I claim the selffeeding apparatus consisting of the racks or combs k ,
N, and, , and the manner of operating the same substantlally as shown and
described described. The self operating refrigerator or bellows, I, for the purpose of
second The
conding current of air towardsthe driving or carrying cylinder, H , sub-
 65,644.-Toy Rope Dancer.-Dominico Cheekeni, Brooklyn, N. Y. Antedated June 5th. $186 \%$.
 65.645.-SAASII LocK.- Charles B. Clark, Buffalo, N. Y.
First, i claim the combination of the eccentric roller D,

 65,646.-Steam Traps. - Richard Colburn, Norwich, Conn. IClaim the arrangement of the valve, its case, and induction and eduction
Iassages substantially in manner as described, in order that the valve when


64,647.--Cotton Seed Planter.-J. A. Cox, Humbolt, Tenn.

 I, sub stantially as and for the purposes herein above set forth.
65,648 . W ELu Tube. - S. F. Craig, Eddyville, Iowa.
 ared to the end of said tube, formino the chamber, E, and air passage, G, as
herein set forth, for the purpose specifided.
65,649 --Rotary Dough Dresser.-George H. Cross, Montpelier, Vt.
pty Dough Dresser.-George H. Cross, Mont-
 $65,650 .-$ Spinning Frame.-J. E. Crowell. Chelsea, Mass.

 65,651.-Wood Screws.-George C. Davis, (assignor to the Davis Screw Company,) Davton, Ohio.

 entre where it joins the core substantially as set forth.
5,652.-Macitines for making Clasps for Hoop Skirts.-
Adolph Delkescamp, (assignor to John A. Newbould,) I claim the swinging bending har, 0 . in enmbination with the slide, i, ies,
d , and n , and punch, e , substantially as and for the purposes set forth. 65,653.-Napkin Holder.-William L. Dewey, Bridgeport, I claim as
 ver at D, as herein shown and described.
65,654.-Compass usen in Calising Seams.-George Dowling, Fair Haven, Conn.
I claim in comhination with the compass, A. the additional or adiustable
o. f.and adjusting arc d, when constructed and operating substantially as
cecribed.
65,655.-Cotton Press.-James E. Duvoll, Sardis, Mississippi.
 65,65f.-Evarorating Pans.--S. P. Dyer, Prairie Depot, $\underset{\text { First. I clai }}{\text { Ohio. }}$

 Third, The comhination of the stationary strainar, A, with the finishing
nan X, X , substantially as herein shown and described and for the purpose set
forth
 65,65\%.-Preventina Incristation in Steam Boilers.-Charles James Eames, New York City.
I claim the mode of prever
tally as herein described.
65,658.--Manufacture of Refined Sugar.-Edward P.
 65,659.-Road Scraper.--N. Evinger, Sand Ford, Ind.




65,660.-Composition for Pavement.-W. P. Ford, and A. A. Moore, Concord, N. H We claim a composition for pavements, \&c. made
65,661.-Animai Traps.-A. Frost, Seymour, Ind.
First. I claim the platelevers, a, a, constructed and arranged. so as to open
or close simultaneously the ,oors, bo, substantilly ansen forth
 65,662.-Mop Head.-O. S. Garretson, Buffalo, N. Y.

 65,663.-SCARF SUPPRRTER.-D. George, Boston, Mass. 65,663.-SCARF SUPPORTER.-D. George, Boston, Mass.
as claim a scarf or neev tie supporter, constructed to operate substantially
65,664.-Manufacture of Starch.-J. J. Gilbert, Little
Falls, N. Y.


65,665.-Treadle Mechanism for Sewing Machines. William Smith Hall, Quincy Mass.
IClaim combining a machine shaft with a treadle by a ratchet, pawll-lever
and connecting rod, arranged to operate together, substantially as de-
scribed.
 65,666-Wistension Horse.-R. Hammill, Mineral Point,



 65,667.-Steam Heating Apparatus.-S. T. Harker, MilI waukee, Wiss.
 moke passage through it arge at the bottom and contracted at the top, and
both ends on the coict entering the dome below the water line, all arranged
and combined substantially as described. 65,668.-Wood Screws.-Harvy J. Harwood, Utica, N. Y. First, , claim forming the end of the screw into a lip or lips substantially as
descrijed.
Second, Extending the lip or lips of the screws beyond the terminus of the Second, Extending the lip or lips of the screws beyond the terminus of the
core substantianl as described
Third, Retaining the full size of the screw at the point without continuing the corre to the point.
Fourth Increasing the pitch between the lip and first thread substantially
as described. 65,669.-SAwing Machines.-Henry Hassenpflug, (assignor to himself and Edward Hassenpflug,) Huntington, Pa.
 65,670.-Field Fence.-Joel Heacock, Marlboro, Ohio.
 nary splitrailsto form the panelsos
and fort te purp ose set forta d described,
65,671.-Button Hole Cutters.-Herrman Hempel, New 65,671.-Butron
York City.
 65,672.-RosetTes.-F. L. Hilbright, and F. Reynold, Newark, N. J.

 65,673.-Elastic Frame For Mosquito Bar Netting.-R.
M. Holland and A. J. Hibbs, Philadelphia, Pa. , M. Holland and A. J. Hibbs, Philadelphia, Pa.
 constructed and
purpose described
65,674.-Composition for Hardening and Preserving
Wood.-H. L. Houghton MCorrison, Ill Wood-H. L. Houghton, Morrison, Ill.
I claim a wood preserving composition formed of the ingredients herein
named and in about the proportions mentioned and applied to wood, sub-
stantially as herein described.
65,675.-Quartz Mills.-W. W. Hubbell and J. M. Patton, 5,675.-Quartz Mill
Philadelphia, Pa.







 stantially as described.
sithty rive removerie steel cup or shoe, 19 , constructed, applied and used
between the verticalshaft and removable step, 21, in the manner and for this
puppose as described. 65,676.-ScRew Box for Vises.-A. Jameson, (assignor to himself, T. S. Murray, and J. H. Murray), Trenton, New Jersey.
I claim the
toxes for vises
65,677.-Mode of Disintegrating Recie. Tohi S5,677.-MODE OF DISINTEGRATING Rocks.-John Jo
Saco, Maine, and R. C. Overton, New York City.
we claim liquid and gaseous hydrocarbon and air, or air and
tuel, cror the purpose herein set forth, and when employed with the agents
for the reduction of temperature substantially as specitled. 65,678 .-Wrenches.-G. B. Keeler, Greenwich, Conn.
 adjustable spring hook, F, sobstantially as and for the ourpose described.
65,679.-Wrenches.-Dennis A. Kellogg, Valparaiso, In$\underset{\text { diana. }}{\text { dim }}$
pose nerein set forth.
65,680.-Cement for fixing Door Knobs.-Patrick Kennedy, New York City.
I claim a cement composed of th
65,681.-Wagon Springs.-Garret C. Lansing and John G.
Ostrom, Rhinebeck, $\mathrm{N}, \mathrm{Y}$. ${ }^{\text {a }}$, a ", etc, when arranged in pairs,
We claim the flat wooden spring a We claim the flat wooden springs, a a, a" $a$ ", ete, when arranged in pairs,
each pair t ripht angles across the other, substantially as and for the pur-
pose herein shown and described. 65,682.-Automatic Fire Extinguisher.-Rufus Lapham,
New York City. New York City.
I claim, First, The application of the expanston of mercury by the heat
produced by the breaking out of a fire in a room to cause an alarm to be





65,683.-Carpet Cleaner.-Theodore Luke, St. Louis, Mo. $\begin{aligned} & \text { Mo. } \\ & \text { I claimbination of the frame, } b b \text {, shaft, a, revolving arms, } h \text {, ro- }\end{aligned}$ ifred.
65,684.-Pumps.-Alexander Moon, Maquoketa, Iowa 1.caim the combination of the pumping crlinder or barrel, A, plunger. $C$,
a nd tubes., D and $J$, when all constructed with valves and arranged together
so as to operate substantially as and for the purpose described. 65,685.-Skates.-H. C. Moore, (assignor to himself and Charles Robinson, Springfield, Mass

 od ${ }^{\text {ciaim the notched eccentric, }}$ G, with its handle, p. tarning up and
under the foot and arranged so that it tightens more securely as the
ends to workout substantially as herein specitied. eel tends to
65,686.--Carpet Stretcher and Holder.-J. S. Mungen, Olean, N. Y.
 B, substantially as described. himself and Mathew T. Higgins, New York City.
 D, within a recess at the front portion of the base of the tooth in the man
ner set forth. 65,688.---Liniment.-Rachel Newcomb, South Brooklyn, $\underset{\text { Iclaim th }}{\text { N. }}$
I claim the liniment made of the ingredients mixed together in and abou
the proportions herein above described. 65,689.-SleiaH Bells.-W. H. Nichols, East Hampton,
Conn. I claim casting a shank of t wo or more or less pins, a a, in and with tiae
sleich bell, A , substantially as and for the purposes herein shown and de
scribed. 65,690.-Pumps.-Hiram Parks, Athens, N. Y.
IIclaim the arrangement of the pump. A, sinker, H, piston rod, B, crank or
elbow piees, CC, Wres or rods., , and lever, E, as herein described, operat-
ing as and for the purpose specitied 65,691.-Keel, Block, or Rest.-Joseph Thomas Parlour, First, Iclaim a block ${ }^{\text {Brookl }}$

 65,692.-Rolling Screen for Doors and Windows, etc. -William G. Perkins, Walden, Vt. I claim the winding screen made up
arranged on suspensonies as speciitied.
65,693.-Medical Compound.-H. G. Pope and H. F. Her rick, New Berlin, N. Y.
We claim a medical compound made of the ingredients mixed together in 65,694.-FENCE.-Esek C. Roberts, Salem, Mich.
I claim the combination of the top rails or riders, E, with the stakes, B and
C, substantially in the manner herein shown and described aud for the pur
pose set iorth. 65,695.-Ротato Planter.-John P. Scudder, Lawrence-
ville, N. J.
First I clam the inclined cylinder, $E$, in combination with the revolving
scoops, s, and adjustable valve, H , all made and operating substantially as
heoren


65,696.-LamP Extinguisher.-Edward Shaw, Portland, M96.-LA
Maine.
I claim the curved extinguisher for lamp of the kind described when con-
structed and applied as and for the purposes set forth. 65,697.-Steam Engine Governor.-J. W. Shirley and
William H. Fasig, Terre Haute, Ind. I claim the wind Whel., A, the shaft, B, and the spring, F', arranged and
operating substantially as herein shown and described tor the purposes set
forth, 65,698.-Lantern Lamp.-Jacob Silvins and William F. He Hain, Sunbury, Penn.
We claim the crust remover, , on the upper end of a vertical shaft, E
which passes through a tube, F , in the lamp, substantially as and for the pur
pose specified. 65,699.-Apparatus for Tempering Wire.-P. L. Slay-65,699.-Apparatus For Tempering Wire.-P. L. Slay-
ton, (assignor to himself and Almet Reed), New York Con, assignor to
City.
First, ICliam the radially adjustable strips or bars, , ar ananged betwee

 65,700.-Sleigh Brake.-William Sloan, Highland, Iowa.
 Second, Attaccaing an arm or prong, G, to the brake, E $F$, substantially as
herein shown and described and for the purpose set forth. 65,701.-Window Sash Fastener.-Sherman Smith, Presque Isle, Maine.
 65,702.-Sugar Evaporator.-W. C. Smith, Warrensburg, Mo.

 65,703 -Jigaing Muctine
65,703 -Jigging Machine for Dressing Ores.-William
W. Spalding, Greenland, Mich.

$$
\begin{aligned}
& \text { W. Spalding, Greenland, Mich. } \\
& \text { First, } \\
& \text { having a watim the main box, in in combsage or throat, a. connectir }
\end{aligned}
$$




 forth. th, The rake, k , in combination with the counter shaft, 1 , the crank
Fort, th, and the sieve, b , arranged and operating as and for the purpose de-
scribe,
 65,704.-Breech Loading Fire-Arm.-R. E. Stephens, I Claim, First, The construction and manner on oneration in a brgech-load-
ing triene armor the hammer, C , in combination with the cam rod, $G$, working
by the double link, M .



 65,705.-Apparatus for Treating Air and Hydro-Car-





 the oblique arrangement of the head and hande for the purpose set forth1
I Ialso clant the combination of the oblique head and handle and magnetize
claws subtent 65,707.-FARM GATE.-John G. Talbot, Sloansville, N. Y.
 65,708.-Button Fastening.-John K. Underhill, Brooklyn,
 65,709.-Plow.-F. Volkman, Hoboken, N. J.




 and or simpler construction.
65,710-B Burglar Alarm.-Isaac M. Wells (assignor to him self and William Wood), Jeffersonville, Ohio.
First, I claim the post or shaft, B, wheel or disk, H, with co
 65,711.-STOP Motion for Steam Engines.--Charles S Westland, Providence, R. I.


 prrpose specified.
$65,712 .-$ SKY LigHT.- Horace Weston, Boston, Mass.
claim forming grooves or gutters, a c, in the bars, B, and at the sides o IClaim forming grooves or gutters, a ac, in the bars, B, and at the sides of
the sash, substanially as and tor the purpose described.
I also clainace
 65,713.-Washing Machine.-E. F. ${ }^{\text {as }}$ Wheeler, Sag Harbor,
 65,714.-Evaporator.-Samuel M. Williams, Pine Village, First, I

 65,715.-Device for Cleaning the Traps of Water Closets.- New York City.

 65,716.-Grain SEpARATOR.-A. J. Alexander, Chicago, Ill
 of the grade of grain to be passe
for the purpose herein specitied.
65,717.-Butt Hinge.-Mason C. Ames, Hartford, Conn. I clanim the arrangement of the hinge joint, b, in its relative position with
the plates, a' a, substantially as and for the purpose described. 65,718.-Pump.-Charles Bemis, Mishawaka, Ind.


65,719.- CUULIVAToR.-Joseph C. Bird, Rising Sun, Md First, I I claim the arrangement of the share frame, E, supported from the
lever, H H, and pivoted rame, 1 p, in such a manner as to ifit vertically or
independently, as described. Second, The trapezoid-s.sanaped cultivator frame, consisting of the portions,
a a b b c c, arranged substan ially as described.
 65,720.-Hydraulic Weighing Apparatus.-Louis Braner, Memphis, Tenn.


 axle, and annectung such wheel directly to the registerng mecianism, sub
stantialy, as described.
Fourth, The case I, adapted forreceiving the registering mechanism when it extencs from the face plate of the whel case, A, into the space surround
 Sixth, The arrangement or the receiving chamber be ow the wheel case, A ,
substantial an and for the purposed escribed.
Seventh, The sample chamber, F . with the outlet, F , and a valve, t , substantially, as and for the purposes, describedi outhet, $F$, and a valve, $t$, sub-
Eifhth, The hydrometer receiver or receivers, for the purpose specified. 65,721.-Slide for Safety Reins.-Frank W. Brooks, Washington, D. C.
First, i claim a metallic slide, which is adapted for being attached to the
sareytine. A, of the reins. , and which is provided with a ring or loop,
substantially as and
 65,722 - MATCH SAFE.-Charles Bunger, New Haven, Conn.
 through the front permits a single match to enter the saig trough, and con-
struced os as tor em ove the match from the said trough, substantially as
and for the purpose specified. 65,723.- Blank for Calks of Horse Shoes.-R. B. Cas
well, Palmer, Mass. I claim,
well a a new article of $n$ n
65,724.-.-STUMP Extractor.-George Chamberlin, Olean




 C5,7z5.-CORN PLow.-John MI. Clark, Somerville, Ohio.




65,726.-Combined Level and Plumb.-Patrick Clifford
 described and set forth.
$65,727 .-$ CANT Hoor.-William S. Colburn, Loami, Ill. Iclaim the cant took consisiting of the forked sider, Do boit, , ho hok, B
and lever,, , constructed and operating in the manner herein descibed. 65,728.-Horse Shoe.-George W. Cooper (assignor to him self and James V. Jones), Ogeechee, Ga.


 65,729.-Lens for Photographic Portratture.-J. H Dallmeyer, London, England.


 65,730-Articles of Paper Wearing Apparel.-Georg , Mass
 pressantantilly as set forth.
65,731.- Bed Botrom.-George H. Dow, Freeport, Ill.
 65,732.-HARvester.-Matthew Easterbrook, Jr., Geneva,

 65,733.- Process of Manufacturing Illuminating Gas. First, William the Elmener, New York City.








 65,734.-LUBRICATOR.- Joseph Fanyou, Bridgeport, Conn.
IClaim the combination, as described, of the cup and the transverse bar 65,735.-Clothes Dryer avd

Farmger Pittsford Mich Stand Combined.-George
 65,736.-COAL SIFTER.-John S. Fifield, Westerly, R. T. I, slaim the arangement of the box A, with wheel E, as constructed, siev

 65,738.-Sorghum Evaporator.-Addison L. Folger, Sumner, Ind.



 65,739.-Parlor Ten-pin Allex.-Charles H. Fowler, West
Roxbury Mass.


 65,740.-Steering Indicator.-Nicolai C. Franzen, HamFirst, , ing, Germany.



 or other transparent material, with a movabie opaque plate or surface have




-John A Frey New York

 pos,742.-Magazine Revolving Fire-arm.-Edward J. Fros New York City
 65,743. - Method of Unloading Railroad Cars.-Ferdi





fied. 744 .-Scale Rule.-William Hay, Dumbarton, Scotland
assignor to Robert Hay, Mineral Point, Wis.

 pecinifod rovtring a rule with the seale, ee earranged in relation with th
解 65,745.-Device for Shearing Metals.-John E. Heath Niles, Mich.


 65,746.-GRAIN BiNDER-Solomon T. Holly, Rockford, Ill First, 1 claim the arrangement in binding apparatus of the band-securin
nitrament and compressing strap - holder at ato substantially as set forth the combination in binding apparatus of the jaws of


 ing and connecting and dideconnecting mechanism, all operationg in the com.
bination sumstantianly an set forth

















 65,747.-Stem Winding Watch.-Edwin B. Horn, Boston,



65,748.-Calendar Clock.-Henry B. Horton and M. L
Wood, (assignors to Wood, (assignors to the Ithaca Calendar Clock Com-
pany), Ithaca, N. Y. First Weny), Ithaca, N. Y.














 65,749.-BuckLe.-G. C. Huntress, Elkhorn, Wis.
 65,750.-TEETH FOR LIFTING Lodged Grain.-William Ma cus Jackson, Woodland Cal
 65,751.-Syrup Strainer.-W. E. Jacobs, Columbus, Ohio
 65.752 - Pressses.-Gilbert D. Jones, New York





05,753.-Engine Piston.-Washington Keemle, Philadel${ }_{\text {First }}$ pia, Pa



65,754.-India Rubber Tread for Carriage Stefs.-Geo. Augustus Keene, Newburyport, Mass.
claim the arrangement and combintion of the
 substantandily as a desconitibed,


 Frourth, The automatic scrapers, , q, constructed and operating as de


 65,756.-Sled Brake.-Herman E. Knapp, Benson, Vt.
 65,757.-Lifter for the Lids of Pitchers.-F. W. L. Knuschke (assignor to the Gorham Manufacturing Co.),
 65,758.-Hose Coupuriva.-Silas H. Lornig, Lawrence, Mass.
 65,759.-Ferrule for Tubular Boilers.-David Mathew, Prairie du Chein, Wis.

 65,760-Diving Apparatus.-Thomas Cato McKeen,Irving-

65,761.-Joint for Carriage Braces.-F. B. Morse, New

 65,762. - Memitiod of Manufacturing Shaciles for CarRIAGE THILLS.-F. B. Morse, New Haven, Ct.
telaim the eneto
blaniz, descorimed and represented by tig. 8 .
65,7\%3.-Wartar ELevaciop-G.Greshom Molt, Big Run, Ohio.

 Yelson Cityssignor to himself and Louis Klueber), New First, rolaim the

 65,7irs.- - Winnowin S Sreeve-H. Ogborn, Richmond, Ind.


 65,766.-Method of Attaching Metal Soles to Boots

 65,767.-Apparatus for Drying Hides, Leather, etc.-
A. W. Roberts (assignor to P. Jewell \& Sons), Hartford. Ct. .t. the air through heating tubes, A, arranged in a heating
 65,768.-Embroidering Attaciment for Sewing Ma-
chines.-Israel M. Rose (assignor to the Sewing Machine Improvement Co.). New York City.

 6J,769. - Winding and Setting Watches.-Henry Rothfelder, New York City.

 65,770.-STove PIPE Drum.-Charles E. Rupell, Jackson-
 65,771.-Corn Planter.-James P. Lelsor, Cherry Box, Inclia the employment of the ratchet, D , substantially in the manner
 65,772.-Brick Kilv.-William A. Shephard, New York


 65,773.-Door and Bit for Boiling and Puddling Fur-
 65,774.-Priming Metallic Cartridaes.-Dexter Smith,
 65,775.-Lightning Rods.-Charles Stearns. Lowell, Mass. assignor to Jacob A. Kissell, Chicago, Ill., who assigns
one-halt of his right to Nathan Blickensderfer, Erie
One-halt of his right to Nathan Bickensderfer, Erie
county, Pa.
caim lightning rod or conductor consisting of a solidily continuous

65,779.-Fastening For Neck Ties.--William J. Terry, Wallha Walla, Washington Territory


 65,777.-Preserving Flowers and other Vegetable Forms.-Mrs. P. T. Pinnig, New York City,




 65,778.-Horss RAEE.-Stephen W. Walker, Anson, Me.
 65,779.- Method of Attaching Eave Troughs to Houses. -Wm. R. Wallis, Alliance, Ohio.
 65,780.-Apparatus for Hardening and Tempering
 rame, , substantially yas hiersing set tor thit th the purposes speng head and the

 65,781.-Weather Strip.-Jeremy B. Wardwell, George town, D. C.
 described tor the purpose specified.
65,782 . MAcMINE FOII DRESSING FEATHERS.-A. Washburn and J. N. Van Sickle, Medina, Ohio.
We claim the arrangement of the p
 65,783.-Breech-loading Fire-arai.-Thomas W. Webley, Birminghana, Eng
 65,784.-Air-heating Furnace.-Geo. W. Wilson, Chelsea, Mass.

radiator, $G$. the main radiator, the fire plate, the air rpace, F, and the
abdutments, $D$, for sup portung the main radiator and conducting smoke into






## RE-ISSUES.

2,641.- Rakes for Reaping Maciinge, Adam R. Reese, (as signee of Thomas N. Lupton), Phillipsburg, N. J. Pat




 2,642.-Crucibles for Metallic Batus.-Benjamin

 2,643.-Huryester-Wm N. Wher (assionee of John S. Troxel), Springfield, Ohio. Patented May 11, 1858.
Difision A.




2,644.-CAsTER-_James T. Barnes, Hudson City, N. J. Pat ented Oct. 30,1866



 set forth for the purpose specified.
2,645 .-VALVE Motion For Steam Enaines.-John D

Shepard, Buffalo, N. Y.., assignee of Horatio O. Perry.
Patented March 25, , $8556 . \quad$ Division A.
claim the Yalve motion abote deeseribod as arranged in relation to and in
 falo, N. Y, assignee of Horatio O. Perry. Patented varch 25, 18356. Division B
I clailuliolding the axis of the holow wroated Eartiali) cellindrical valve
 purpos herein secinied.
2,677.-MowING MACriNE.--Peter V. Staats, Raritan, N. J. assignee by mesne



 Tger beam, and havingtwo paraile joints, transerse to the beam, Whereby


 the finger beam.
2,648.-Mowing Machine.-Peter V. Staats, Raritan, N. J. assignnee by mesne assignments of Patented Dec. 18, 1860. Division B



## DESIGNS

2,671.-Napkin Ring.-Francis J. Clamer, Philadelphia, Pa 2,672.-STEAM Fire Engine.-Benaiah Fitts (assignor to
Gould Machine Company), Newark, N. J. 2,673.-PLATES of A Stove.- lsaac A. Sheppard, Philadel phia, Pa.
correction-Issued may 14, 1867.
64,741. - Melodeon. - Jonas Berger, Knoxville, Ill. (not Claimn, In. twe construction of an upright melodeon, arranging four swell


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## NEW YORK STATE TRIAL OF:BREECH-LOADERS.

## REPORT OF EXAMINING BOARD.

The trials of breech-loading small arms during the past winter by the Board of Officers detailed by Governor Fenton excited great interest among military men and inventors. The latest improvements and inventions were exhibited to the board, the sessions of which were attended by the Russian, English, Spanish, and Danish officers sent to this country by their respective governments to examine breech-ioaders.
Thirty days were occupied in the examination of seventeen arms, of systems adapted to conversion of muzzle-loaders, ten arms not so adapted, and three magazine or repeating guns. The tests were severe, but only such as would fairly represent the contingencies of actual service. A description of each arm is given, and a full record of its endurance under the several tests. The arms are divided into five distinct classes or systems, based upon the attachment and movement of the breech-block, as follows:
First Class.-The breech-block hinged to front or rear of receiver, and moving in a plane parallel to the axis of the barrel, in which are included Milbank and Montstorm, Jos adapted to conversion of muzzle-loaders. SECOND Class.-The breech-block hinged to the left-hand side of receiver, and moving in a plane at right angles to the axis of the barrel, including the Emp
yn's cap, both adapted to conversions.
Third Class.-The breech-block moving on a pivot at its rear end, and the forward end dropping in the receiver, be Roberts, adapted to conversions, and the Peabody, intended for original arms.

Fourth Class.-The breech-block pivoted at its lower front portion, near the front of receiver, and below the level of chamber; revolving in a vertical plane passing through to close it, including the Miller, Poultney, Remington, and e Robertson and Simpson, all intended for original arms. either horizontally or vertically, including the Gray and the Meigs, both adapted to conversions, and the Ballard, National and Sharps, intended for original arms.
In addition to which classification is the Empire No. 2 having no movable breech-block, the motion being in th barrel.
The $m$
The magazine guns examined were the Ball's, Gray's, and or points, based upon its experiments, which may be briefi stated thus:

1. That arms in classes first and second may bo objected to, as having too
extensive movement of breen-hlock and furthermore that it is an unde-
cioed question whether the hinge attachment is sufficiently stable . That breech-blocks hinged as in in classes first and second require an inde
pendent pendent locking device. That breech blocks.
awk ward to manipulat
Wk ward to manipulate.
Tie on arms of the third class, having lever ant onove the stock, are objection
5 onstrained action in overating them.

 weakness. extensive lever movement in any arm is objectionable.
2. That
3. That the retration ot the empty cartridge-case should be, by a positive
motion independent of springs.



vice. the arms presented to and tested by the board, it reports:
O. Of trose adapted to conversion of muzze-load ers, it deems
I. Of than
Berdan and the Reboberts assuperior in inl respects to tany and thl the ollin, the
But each of these arms possessing distinctive features, more or less merits
Biousin to



 nd Sth, Millirs's.
III II regar to magazine or repeating arms the Board is convinced that
or the present their use should be contined to the cavalry service, as an exminntion of the record shtims per minute as a repeating arm, and are more
 cal periods. The limited force of cavalry in the State service renders an im. nediate decision on this point unim portant, and the board recommends a de-
ay in the selection and purchase ort repeang arms as several new in ven
ions are now being pertected, and will soon be presented for trial and com-
ietition
 the board will commence on July 9 th next, the competative trials of sys-
Tems for conversion of muzzle loadizg arms into practical breech loaders.

Army and Nooy Journal.

It is reported that a new island has been discovered in the North Pacific ocean, between 50 deg. west longitude, and 40 deg. 30 min . north latitude, twenty miles long. It is exactly in the track of vessels bound to this port from China and Japan. Fogs and misty weather prevail in that section of the Pacific. It is supposed that many missing vessels have been wrecked there. The discovery is considered of sufflcient importance to justify the Government in dispatching a vessel to locate the exact position of the island. A company has been organized in San Francisco to survey the island, and they will send vessels this week to examine and take posession of


## a patent, and thus place them on an equal footing before the ocourts and the puoblic For Foreign Patents.--American Inventors should bear in mind that, as a teneral rule, any invention that is val- nabbe to the patentee in this conntry is worth equall as    cont Laings further information conntion cation to Messrs. MUNN \& Co. <br>   by presenting them to their friends Address all communications to <br> IUNN \& CO., <br> No. 37 Park Row, New York City. Offle in Washington, Cor. F and 7 thi streets. <br> Patents are Granted for Seventeen Years, he following being a schedule of fees:-   <br> On application for Reissue... T......... <br>   In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $\$ 500$ on application. <br> City Subscribers.-The Scientific AmerICAN will be delivered in every part or the clity at $\$ 4$ a year. Single copies for sale at all the News Stands in year. Siugle copies for sale at all the News Stands in tets city, Brooklyn, Jersey City, and Williamsburg, an by $m$ ost of the News Dealers in the United States. <br> Patent Claims.-Persons desiring the claim of any invention, patented within thirty years, can ob- tain a copy by addressing a note to this office, giving name of patentee and date of patent, when known, and inclosing $\$ 1$ as a fee for copying. We can also the claim sketch of anypatented machine to accompany at a reasonable additional cost. Address MUNN \& CO. Patent Solicitors, No. 37 Park Row, New York.

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