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Water Purifier for Steam Boilers.

The accompanying engravings represent the apparatus for depositing the mineral and other matter contained in water, for which a patent was granted to Gustavus Weissenborn, of this city, on the 16th of January last.

Fig. 1 is a longitudinal vertical section of the apparatus. Fig. 2 is a horizontal section through the large cylinder, A B, and fig. 3 is a plan view of the spiral exhaust chamber. The nature of the invention consists in the method of depositing mineral or other foreign matter held in solution in water, by heating the hard water by steam, and causing it to trickle or flow over an extensive surface of stones, twigs, and similar substances, and thus deposit the earthy or mineral substances in the water by the agency of heat, and the great extent of surface over which the water is made to flow.

b, fig. 3, is a pipe for introducing the steam. *e* is a pipe through which the hard water to be purified is injected in fine jets. *ffff* is the spiral channel through which the commingled water and steam pass to the center, 2, where they enter, in a fine shower, into the large cylinder, A B, and through brushwood, H, in fig. 1, between which and the sides of the cylinder, an open space is preserved, by four upright pieces of wood, at equal distances apart, and kept in their position by iron rings, 2'. The heated water flows from the brushwood into a sheet iron case, K, containing horse manure, through which it passes into the nterior cylinder, which is a brass sieve, K', thence to the lower receptacle, which is placed in the ground, and can be made of wood. In this the water ascends from the bottom through pebbles or small stones, L, as shown by the arrows, fig. 1, then falls and rises again through pebbles in separate compartments, from which it passes to the reservoir, and is thence drawn off by a feed pump attached to the pipe, M. C is an exhaust relief pipe; *g* is the cover of the apparatus, and *v* represents a float to regulate the admission of water.

This is a close apparatus, and it will be understood that it is connected with a steam engine, the exhaust steam of which is injected into it, to heat the cold hard water which is admitted through the pipe, *e*, as has been described. The object of it is to deposit all the matter held in solution in hard water, on the brushwood, pebbles, &c., so as to render it pure previous to its being used in the steam boiler, and thus prevent it forming incrustations therein, the very principle recommended some years since in our columns to be employed in the limestone districts of our country for steam boilers, and which Mr. Weissenborn has here ingeniously carried out into practice. The annexed engravings represent an apparatus, designed for Messrs. Stillman Allen, & Co., of the Novelty Works, this city for an engine of about 100-horse power, and is about 2 feet 8 inches in diameter, and 5 feet high, with a tank or reservoir below ground of 5 feet long, 3 feet wide, and 2 feet deep.

The pumps force the hard water into the purifier, and steam from a boiler, or the exhaust steam from the engine is admitted, in sufficient quantity to heat the water to about boiling point. These come in contact in the upper part of the apparatus, at the entrance to a coil of pipe, which may be of 20 to 40 feet in length, and is arranged in the spiral form, to economise space, and afford greater friction than a straight smooth channel. The water is admitted through a sliding strainer, which divides the stream into numerous fine jets, thus insuring a more complete commingling with the steam, the force of which drives it with great velocity through this winding channel; thence it runs to the perforated basin, where it is showered over and trickles through the brush; from this it filters through horse manure, charcoal, or other suitable substances contained in a coarse mat or sack, then falls and rises through the pebbles, L, placed in two or three compartments of the tank, from which it flows freed of its mineral matter, as described, into the reservoir, and thence by the feed pump is conveyed to the boiler. Any surplus steam from the apparatus is carried off to the air, or to a condenser.

At each stage of the process, a portion of the salts contained in the water is set free, and deposited in the purifier, chiefly in the spiral channel, and upon the twigs and stones, or whatever substitutes for them it may be most convenient to use, and also as a muddy precipitate at the bottom.

Due provision is of course made for opening the different parts of the apparatus, to remove the mineral and earthy matter from time to time—about every three or four months, we are told.

The most common incrustations formed in steam boilers are of carbonate and sulphate of lime and magnesia. Heat expels from water its free carbonic acid, without the presence of which the carbonates of lime, &c., are insoluble, consequently, when the acid is expelled, these matters are precipitated. The evaporation of the heated water, causing a concentration of these salts, likewise brings them in excess of the power of the water to hold them in solution, and also tends to the same results—their deposition. This is the philosophy of the process. But these agencies alone are insufficient to effect the separation of all the mineral matter before the water enters the boiler. To complete the process, the violent agitation of the water, its subdivision into small streams, and, in this state, meeting with, and percolating or trickling through, a mass of material presenting a great extent of surfaces for contact; all have to perform their part. As a further security for the desired result, horse manure, charcoal, or other matter, may be used, the object being, by the operation of their chemical affinities, to precipitate any solid matter which may chance still to have remained in solution.

The joint action of these principles purifies the water of its incrusting salts before it comes to be used in the boiler, leaving them deposited in the apparatus, where they are of no detriment.

This Incrustation Preventor requires but little space and attention, and it may be made quite a neat and ornamental attachment to the engine, while its utility as a heater is also self-evident. The impracticability of using the ordinary heaters for hard water, on account of the frequent bursting of the feed pipes from incrustations, renders this apparatus very valuable for some districts in our country. At the same time its services as a condenser are also deserving of attention. The form of this apparatus can be varied to suit the requirements of parties using it. The manifold evils resulting from the formation of incrustations in steam boilers, are well-known to all our readers, and need not be further alluded to at present. An efficient and simple remedy has long been a desideratum. Mr. Weissenborn—who is a mechanical draughtsman and engineer—has devoted much attention to the subject, and has invented this apparatus, and practically tested it. It is now attracting considerable attention in this city, and is here presented so that the public may have an opportunity of judging for themselves of its merits.

More information may be obtained of E. W Sargent, Delmonico's Hotel, Broadway, N. Y.

WEISSENBORN'S PATENT WATER PURIFIER FOR STEAM BOILERS.

Fig. 1

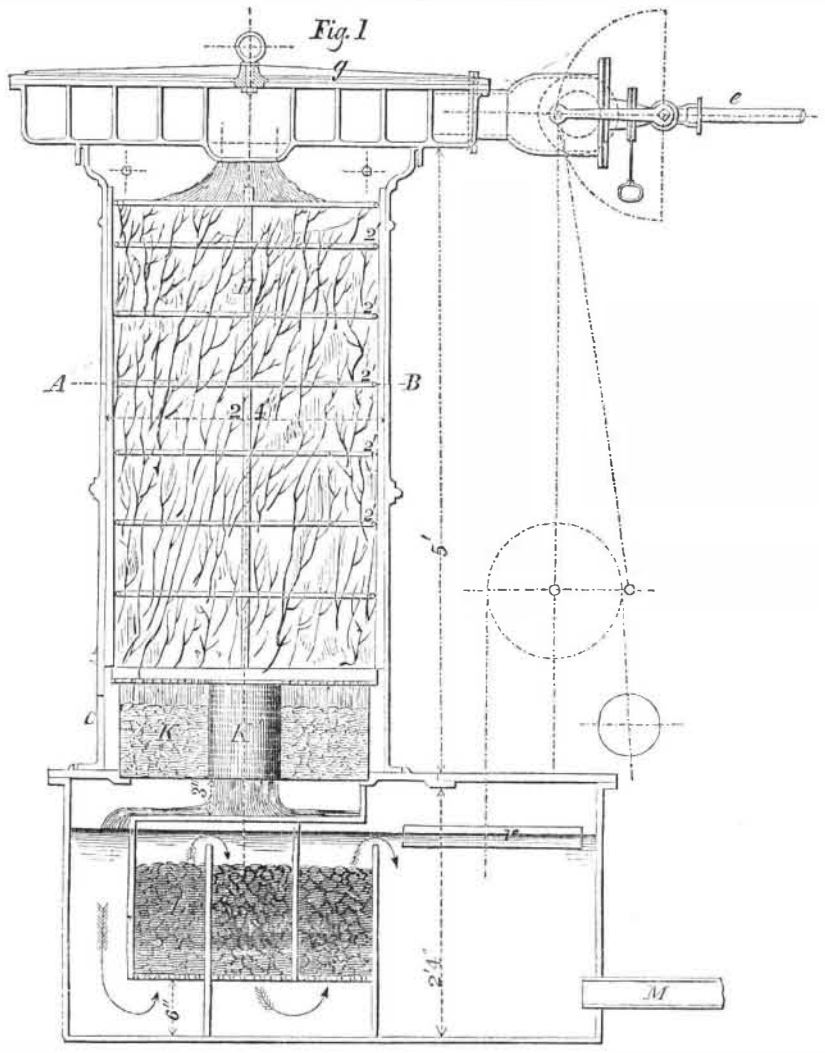
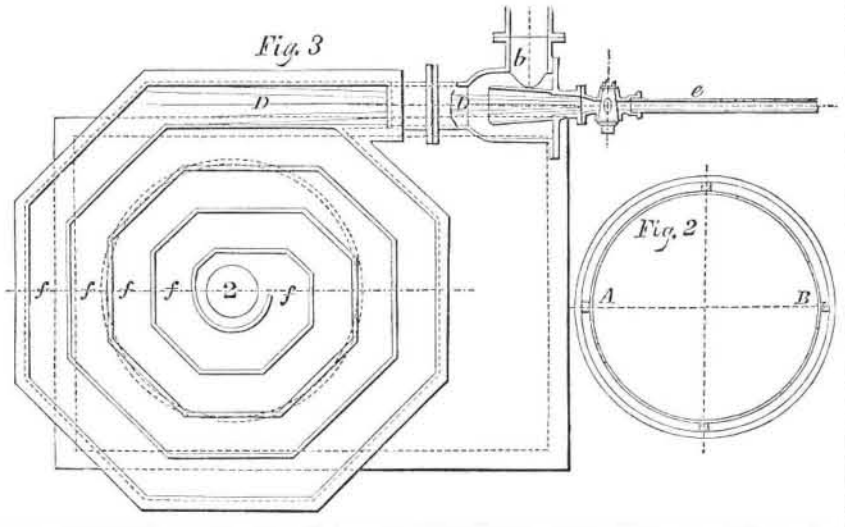


Fig. 3



Saltpeter.

Dr. A. A. Hayes, in a communication to the Boston *Atlas*, suggests a plan by which the present scarcity and high price of saltpeter may be in a great measure obviated. He proposes to import nitrate of soda, which is a natural product, found in the district of Atacama, South Peru. He says, "As the price of nitrate of soda at the port of shipment, is to a large extent made up from the cost of fuel consumed in refining (the country is a desert,) and the expense of transportation, it is apparent to every one, that under judicious arrangement, these charges might be much reduced, and either the crude or refined article delivered at the shipping port, at a cost much less than at present. During the last ten years, the cargo price of nitrate of soda at this port has not much exceeded two-thirds the price of the first quality of saltpeter, and it is now less than half that price. Nitrate of soda, in its dry and pure state, is composed of anhydrous nitric acid 63·53, and anhydrous soda 36·47 parts in a 100. As the nitric acid in 100 parts of saltpeter weighs 53,21, one hundred parts of nitrate of soda should afford nearly one hundred and nineteen parts of saltpeter, by exchanging its soda base for an equivalent of potash. This change can be easily effected by means of salts of potash, when salts of soda are produced on one hand, and saltpeter on the other. Salts of potash abound in wood ashes, and where wood ashes can be obtained, or any salt of potash cheaply, we may at once compete with India in the production of saltpeter for home consumption."

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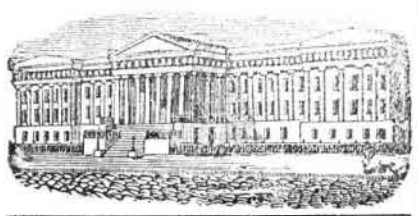

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING DEC. 11, 1855.

BLEACHING IVORY—Wm. M. Welling, of Brooklyn, N. Y.: I claim the method described and shown, of bleaching ivory plates, by so placing and sustaining them on their edges, in a suitable case, that the sun's rays shall act with uniform power and bleach said plates equally on both sides, in the manner and as specified, thereby dispensing with the usual method of turning the plates over, to expose, alternately, the flat sides to the action of the light, and preventing warping or damage to the ivory, and accomplishing said bleaching operation in far less time, and more perfectly.

FOLDING AND MEASURING CLOTH—James Baxendale, of Providence, R. I.: I claim, first, the employment of separate rods, b b, b' b', for the several folds of the cloth, the said rods being arranged and operated to fall across the successive layers of the cloth, as they are laid, by the movements of a suitable reciprocating carriage over the folding table, and to remain within the folds till the folding of the whole piece is completed, substantially as set forth.

Second, the manner of operating the said rods, b b, b' b', to throw them from their upright positions, across and upon the cloth, by means of the nut, J J', and the screws, I I', which are actuated by the movements of the reciprocating carriage, substantially as described.

[The cloth passes from a roller on which it is wound through a reciprocating carriage; the latter moves back and forth over a horizontal table which receives the cloth, at each movement of the carriage a hinged rod drops from the machine into the fold made and remains in the crease until the whole piece is finished; there is a rod for each crease; when the piece is all finished it is drawn off from the rods, and the latter thrown back for use again. The machine works with certainty: it is quite simple in its operations and might, we think, be introduced with great success in all establishments where large quantities of goods are to be put up. By the attachment of a registering apparatus is the exact length of the cloth folded might be unerringly exhibited. B. B. Babbitt, Esq., of Providence, is assignee of one half of this patent.]

BOOT AND SHOE PEG CUTTERS—H. E. Chapman, of Albany, N. Y.: I claim the making of shoemakers' floats or peg cutters with planing cutters, substantially as the same is set forth and described.

FOUNTAIN INKSTAND—C. T. Close, of New York City. I claim the arrangement and combination, substantially as specified, of the upper tube or passage, b, connecting the top or air space of the reservoir with the pen cup at or immediately below the level the ink is designed to stand in said cup, the latter being connected with the reservoir, in manner shown or equivalently thereto, and the ink in the pen cup, forming a fluid valve, that upon the insertion of the pen, and withdrawal thereof, alternately opens and closes the lower end of the upper connecting tube, for the free, rapid, and certain admission of fresh air, at intervals, in the reservoir, as required.

WATER GAUGES FOR STEAM BOILERS.—Josephus Echols, of Columbus, Ga.: Although I have described the glasses on each side as being attached to nuts in frames, which can be removed, I do not wish to limit myself to this, as glasses on one side may be secured directly to the gauge tube and be got at for the purpose of cleaning, when the glass or glasses are removed on the other side.

Nor do I wish to be understood as limiting myself to the special mode of construction specified, as other equivalent modes may be substituted.

I claim making gauge tubes for indicting the hight of water in steam boilers with an aperture provided with convex glass, presenting the convex or arched surface to the pressure in the tube, substantially as, and for the purpose specified.

GAS APPARATUS—John S. Gallaher, Jr., & John W. Smith, of Washington, D. C: Disclaiming all and every part of our apparatus taken individually, we claim, solely, the arrangement of the said parts, and specifically of the retort, X, with Hooke's blow-pipe, C, combined with the furnace, a a a a, the water reservoir, b b b, the strainer, K K, the receiver, m m, in the manner as specified, and for the purpose of constituting a compact and portable gas generating and purifying apparatus.

RAILROAD CAR SPRINGS—P. G. Gardiner, of New York City: I claim my improved car spring composed of a coiled plate spring combined with a segmental base, and a movable segmental cap, substantially as set forth.

[This invention consists, first, in a volute spring composed of a flat strip of metal arranged to receive the force or weight in a direction parallel with the axis of the volute. A weaker spring of any suitable form and material is introduced into the center of the volute spring, for the purpose of giving a support to both ends of the volute at the same time, and thereby effectually preventing the occurrence of a fracture through any sudden concussion.

The invention consists, secondly, in encasing the volute spring within a double bed, which, while it yields to every movement of the spring, forms an efficient guide to prevent any lateral movement, and also protects the spring from dust. At the late fair at the Crystal Palace, we saw some tests of this invention made, which satisfied us that it was an important and valuable improvement.]

TILE ROOFING—Gottlieb Graessle, of Hamilton, O.: I claim the construction substantially as described, of tile roofing, having each over-lapping edge, a, resting by an angle only, upon the flat sublying surface, b, between the ridges, c d, of the adjacent tile, and having two transverse ridges, e f, on the top of each tile, enclosed by similar ridges, g h, projecting from the superjacent under surfaces of the tier next above, for the purposes explained.

RAKING AND LOADING HAY—John K. Harris, of Allensville, Ind.: I do not claim any form of attachment to the wagon, or the manner of forming the spring of the rake teeth, or any continued endless belt motion, with an ordinary rake attached behind, to save the hay, passed over by the endless belt elevator.

But I claim, in combination with the rake, for the purpose of taking the hay from the rake in regular successive equal intervals of time, and in separate parcels, and elevating and delivering it on the wagon, substantially in the manner and for the purpose as described.

BEDSTEADS—Benjn. Hinkley, of Troy, N. Y.: I do not claim the cross springs as a means of support.

But I claim the cross bars, whether springs or not, for the support of a bedstead frame, when the same are mounted upon a pedestal and stand, as set forth.

ATTACHING EXTINGUISHERS TO LAMPS—F. A. Jewett, of Abington, Mass.: I claim attaching the cap or extinguisher to the lamp by means of a spiral spring, coiled around the wick tube, and secured at one end to the cap, and at the other to the screw plate, c, or in any other convenient locality, whereby the cap is tightly drawn down over the wick, as described.

LOCKS FOR FREIGHT CARS—Henry C. Jones, of Newark, N. J.: I claim combining with the double jaw spring bolts of a lock, and with the levers, by which the jaws are opened, by the action of the key, as specified, a stop tumbler, substantially such as described, operated by the key, after the jaw bolts have been opened, to hold and keep them apart, after the key is taken out of the lock, that the lock may be employed as a stop or dead bolt lock, as specified.

IMPACT WATER WHEEL—Athison Queal, of Plymouth, N. Y.: I claim the sliding buckets, H H, placed on the head, D, of the wheel, and operated by the inclined semicircular rod, J, in combination with the partition, L, arranged as shown and described.

I further claim attaching the wheel, C, to the shaft, G, by means of the pins, c c, fitting in the hub, h, the pins being attached to a ball, d, on the shaft, for the purpose set forth.

[The above is a horizontal water wheel, the buckets of which are movable, being made to rise and fall, alternately, on the reception and discharge of the water. The noval feature consists in the peculiar method of causing the buckets to move instantly and at the proper moment. An engraving would be required to exhibit the moving parts correctly. The inventor states that in this wheel the full force of the water is brought against the buckets suddenly, at the right time, without any back pressure, and that the force is continued until the moment of discharge. The exit of the water, which is permitted by the raising of the buckets, is free and quick, without any drag. It is believed that the wheel will afford a greater per centage of power than any other of its class. Its construction is not expensive.]

CORN SHELLERS—James J. Johnston, of Alleghany City, Pa.: I claim the secondary cleaners or pickers, f, revolved around the cob, as the cob is projected by the main cylinder, c, through the opening in the case, a, of the machine, substantially in the manner and for the purpose described.

SAND PAPER MAKING MACHINES—Gilbert D. Jones, of Jersey City, N. J.: I claim, first, applying the sand or grit in a heated state, to the glued surface of the paper, for the purpose set forth.

Second, the method of depositing the sand upon the glued surface, that is to say by projecting it forcibly against said surface, while in such reversed position that the excess shall fall off by gravity, as described.

Third, the combination of the stationary pieces, o, or their equivalent, with the moving drum, the paper, and the glueing roller, for the purpose set forth.

CUTTING OUT, PUNCHING, AND STAMPING THE SOLES AND HEELS OF BOOTS AND SHOES—Jean Pierre Molliere, of Lyons, France. Patented in France, July 22, 1853: I claim the cutting out of soles and heels by the blades, a a and bb, from strips of hammered or other leather, sliding between the guide pieces, r r, and held in place by the stoppers, x x, the pricking and stamping of the heels and soles, so cut out by the awls, d, and the stamp, e, at the same time, the three operations being performed at one stroke, the detaching from the blades and awls of the pieces cut out, pricked, and stamped, by the detaching rods, m m and o, and the adjustment of the eccentrics upon the shaft, L, in such manner that two of the punchers can operate at one and the same time, the whole constructed and operated substantially as described.

PROCESSES FOR CALICO PRINTING—Robt. Prince, of Lowell, Mass., and Ambrose Lovis, of Boston, Mass.: We are aware that pure silicate of soda alone, or with pure carbonate of soda, has been used heretofore in dunging; and we are also aware that silicate of lime has been used for the same purpose. We disclaim the use of these substances. Confining ourselves to the use of the silicate, in mixture with neutral and alkaline salts.

We claim the manufacture of silicate of soda, or potash containing foreign neutral salts, and the use of this compound with carbonate of soda and neutral salts, in dunging operations, substantially as set forth.

SAWING MARBLE, &c., IN TAPER FORM—Geo. T. Pearsall, of Apalachin, N. Y.: I do not claim the adjustable bars, H, irrespective of the mode of operating them; nor do I claim the laterally moving saws placed within a reciprocating saw frame, for they have been previously used.

But I claim the employment or use of the levers, C K, the levers, K, being connected to the sockets, I, of the bars, H, and the uprights, f, of the framing, A, and the levers, C, being attached to the frame, B, and the framing, A, substantially as shown, for the purpose specified.

[The nature of this invention consists in the employment of cross levers attached to the saw frame guides, and also to the horizontal frame on which the saw frame works, for the purpose of causing the saw frame guides to be moved laterally in a perfectly vertical position, and at the same time enabling the horizontal frame to work up and down in a horizontal position. The machine is intended for simultaneously sawing two sides of a block of marble on a taper.]

BUCKLES—Sheldon S. Hartshorn, of Orange, Conn.: I claim constructing the tongue, s, and loop of the buckle in one part, and at one operation, in such a manner that the socket, a fig. 3, will firmly secure the joint. b, in the other part, fig. 2, so as to need no other fastening, as described.

MOSQUITO CURTAINS—John S. Martin, of Boston, Mass.: I claim the mosquito curtain, as made of two bars, a sheet of cloth or netting, and a series of elastic bands, arranged and applied, and so as to operate together, substantially as set forth.

ADJUSTING CIRCULAR SAWS OBLIQUELY TO THEIR SHAFTS—Amos D. Highfield, of Philadelphia, Pa., assignor to himself and Wm. H. Harrison, of same place: I do not desire to claim the exclusive use of oblique circular saws for cutting grooves, as such are well known.

But I claim the employment of two beveled washers between a fixed collar on the spindle and the circular saw, in the manner and for the purpose specified.

CORN SHELLERS—J. P. Smith, of Hummelstown, Pa.: I claim the construction of the frustums, D and C, with their winding wings, d d, upon both and cross projections, c c, upon one, substantially in the manner and for the purposes set forth.

CARVING WOOD, &c.—I. M. Singer, of New York City: I do not limit myself to the special construction or arrangement of parts specified, as these may be varied without changing the mode of operation of my invention.

I do not claim the combination of the tracer with the tracer which carries the block of wood to be carved, by means of one system of pentagraph levers, as this is described in a patent granted me on the 10th day of April, 1849.

But I claim combining the tracer with the table which carries the block of wood to be carved, by means of two systems of pentagraph levers operating at right angles with each other, substantially as described, whereby the block to be carved will be directed and presented to the action of the cutter, in such manner as to determine the configuration as well in a vertical as in a horizontal direction, as set forth.

SLIDE VALVES FOR STEAM ENGINES—E. D. Leavitt, Jr., of Lowell, Mass.: I claim making the valve and the corresponding parts of the steam chest, between which it works, of tapering form laterally, and fitting the valve to its rod, in such a manner as to be capable of lateral movement, substantially as described; whereby the valve is always kept tight between the seat and the back of the steam chest, by the pressure of the steam, and the wearing of the rubbing surfaces is always compensated for.

[In carrying out this invention the back of the valve is fitted to the cover of the steam chest, between which and its seat it works steam tight. The improvement consists in a certain method of compensating for the wear of the valve and the two faces between which it works. There is an arrangement whereby the valve is more perfectly balanced than by the ordinary method. The valve is made tapering in a transverse direction, but in a longitudinal direction its two faces are parallel. By thus tapering the valve, one of its sides is caused to have a greater area than the other, and the steam, by exerting a greater pressure on the larger area, tends to force the valve between the faces in which it moves, and thus keeps it always tight. It is a good improvement.]

MANUFACTURE OF CANNON.—Daniel Treadwell, of London, Eng.: I do not claim using hoops generally, in making cannon, as the earliest cannon known were formed, in part, by hoops brazed upon them.

But my invention consists in constructing cannon with hoops around, and shrunk upon a body, in which the caliber is formed, in the manner described

CARRIAGE HUBS—S. W. Reed, of Berkshire, N. Y.: I am aware that a loose disk brace, or flange, has been used to support the spokes of a wheel, mounted on and supported between the two flanges of a hub, and having recesses to receive the forked tenon of a spoke, formed by a saw cut, into which the disk is fitted; such a hub I do not claim, as that has been patented by J. B. Haydon.

But I claim the arrangement of the dodged mortises, D, formed on both sides of the perma ent projecting flange or brace, C, by the triangularly-shaped projections, A, radiating from the tube, B, for the reception of the spoke tenon, S, where by a double row of spokes may be inserted in the hub, and supported by the flange, C, in combination with the nuts, H, to tighten or lock the spokes, and by which a broken or worn-out spoke may be removed and a new one inserted in its place, without untiring the wheel, as described.

CUTTING ARTICLES FROM LEATHER—Chas. Rice, of Boston, Mass., and S. H. Whorf, of Roxbury, Mass.: We lay no claim to any of the devices or combinations contained in the machines described in patents Nos. 6,055 and 12,128.

But we claim combining the cutting die with the platen by means of a rotary and adjustable plate, L, in combination with so applying the pack clamp to its pitman, that it may turn thereon when the die or cutter is revolved in the manner and for the purpose as specified.

We also claim the described arrangement of the operative mechanism of the pack clamp, and that by which the cutter is either depressed or elevated.

AUGER HANDLES—Guillaume Henri Talbot, of Boston, Mass. Patented in England Aug. 25, 1855: I do not claim the manner described of giving a revolving action, in either direction, to the auger bit, or boring tool, by reversible pawls and ratchets, operating in connection with a vibrating handle apart from the relative arrangement and form of handle specified, as such is common to drill stocks.

But I claim in gimlet or auger handles, the arrangement substantially as specified, within the body of the said handle, which crosses the bit of the ratchets, a b, and pawls, a' b', with their reversing gear, for operation of the bit, or bit socket, in either direction, either by a revolving or vibratory action of the gimlet handle, on pressure of the hand, applied on both sides of the axial line of the bit and under the usual clutch of the hand on the handle over the center line of the bit, and whereby the actuating pawls, ratchets, and accompanying devices, form no obstruction, and protected from injury or derangement, essentially as set forth.

[In this improvement there is a double ratchet movement, contained within the handle of the tool, which enables the operator to revolve the gimblet without removing his hand from the handle. In confined places, where there is not room for turning the handle, and, indeed, in all places and positions this improvement will be found very convenient. There is a reversing catch, by pressing which the direction in which the tool turns is changed. All the moving parts are contained within the handle, which, in external appearance is the same as those in ordinary use. The invention is applicable to augers, screw drivers, and a variety of tools. Patented in the United States and Europe through the SCIENTIFIC AMERICAN Patent Agency.]

CHAIN MAKING MACHINES—Edward Weissenborn, of New York City; I claim, first, the employment for welding the rings of two rollers, grooved spirally in opposite directions, and operating substantially as described.

Second, arranging one of the end bearings, K', of one of the spirally grooved welding rollers, so as to be capable of sliding lengthwise to the roller, substantially as described, far enough to allow the ring to be shipped over the end of the roller.

Third, the manner described of raising, depressing and confining the upper roller, to allow the ring to be slipped over the lower roller, to wit, by means of the rods, n' n', the yoke, N, the spring, n n, and the cam shaft, P, with the cams, n'' n'', the whole being arranged and operating substantially as set forth.

Fourth, the traveling box, R, operating substantially as described, to carry the rings quickly over the end of, and up to the back end of the welding roller, L, and to come back with the ring, at a speed properly corresponding with the velocity of the rollers and pitch of the spiral grooves.

Fifth, I claim the carrier, x, operating substantially as described, first, to move forward to receive the ring in its fork, then moving quickly upwards, to snatch the ring from the box, and afterwards dragging the ring along the plate, which contains the elongating mechanism, till it comes in contact with one of the elongating posts, or its equivalent, as is thereby taken from the fork of the carrier.

Sixth, the combination of the movable parts, v v', and side dies, w w, operating substantially as described, to elongate the ring, and at the same time close or drive towards each other the elongating sides.

Seventh, the arrangement of the dies, w' w', round which the link is bent or doubled, substantially as described relatively to the dies, w w, by which the elongated sides of the link are forced towards each other, and their attachment to the same, whereby, when the link has received the form shown in fig. 8, it is caused to be in readiness to be bent or doubled by the action of the hooks, V V, or other equivalent.

Eighth, Operating the posts, v v', by which the elongation of the wing is performed, by means of a wedge or double inclined piece, 21, attached to one of the side dies, w', acting upon studs, 22, attached to the slides which carry the said posts, whereby the approach of the side dies towards each other, and retreat of the posts from each other, are effected simultaneously.

Ninth, the suspension of the bending hooks at their pivot, z, and application of a spring to draw their points apart, substantially as described, so that the said hooks will descend in an open state, and will be in condition to receive the link, when the latter is sufficiently elongated, but that in ascending and drawing up the ends of the link they will gradually close, as required by the changing form of the link.

[The chain made by this machine is not like that in common use, but is of a peculiar kind, which may be called "double link chain;" it is made, not of pairs of links, but strictly of double links, each consisting of only one piece of metal. The links are faggoted and welded before being put into the chain, and to make them enclose each other, only require to be bent. It is in a great measure owing to the manner of making the links which gives this chain the superiority which it is claimed to possess over the common kind of chain. This machine performs the whole of the process of making the chain from the forging of the links to putting them together. The first operation which takes place at one end of the machine, is that of winding up a small piece of small flat iron rod till it forms a coil of several thicknesses of metal This coil is taken to a proper fire and heated to a welding heat, and then put in another part of the machine, by which it is welded into a ring which is equally strong at all points. From the last-named part of the machine the ring is taken by automatic devices to another part, where it is elongated in one direction and closed in a direction at right angles to it, till it forms a link which resembles the figure 8, except that the two sides do not cross in the middle. It is then taken by other devices and bent at the middle of its length, and then, by hand, put through another link and placed in another part of the machine, by which its looped extremities are drawn close together, which finishes it. The next link passing through these looped ends secures them, and thus the chain is formed All the operations are performed with great rapidity. The invention is regarded as one of great value and importance. American and European patents have been secured through the Scientific American Agency.]

EMBOSSED LEATHER—Israel Amies, of Philadelphia, Pa.: I wish it to be understood that although I have described one particular process of treating veneers, before my improved art of embossing is practiced thereon, I do not desire to confine myself to that process in every minutia, as the same may be modified, or equivalents substituted.

But I claim the employment of embossing veneers, in the construction of furniture, and for other ornamental purposes, in the manner set forth.

PIANOFORTE ACTION—Francis Taylor, of New York City: I do not claim the button, m, taking the second knuckle of the hammer butt, as this has been used as an attachment to the key.

But I am not aware that this button, m, has ever before been made as a permanent attachment to and moving with the fly of the jack, in the manner, and as specified, whereby the fly of the jack is held to the knuckle, 3, by the button, m, until the hammer is sufficiently raised for said button, m, to clear the knuckle, 2, and also replaces the said fly of the jack beneath said knuckle, 3, immediately that the key is released and the hammer descends but a short distance, producing an instantaneous and uniform repeating action.

Therefore, I claim the regulating button, m, permanently connected to moving with and governing the fly of the jack, in its action on the butt of the hammer, the whole arranged and operating substantially as specified.

PACKING PISTONS FOR STEAM ENGINES—Joel W. Pettis, of Hillsdale, Mich.: I do not claim the forcing out of the packing by means of radial arms within the piston, when the said arms have only a sliding rectilinear movement produced by cones at the center, as such have heretofore been used, and I consider that arrangement inferior to, or more likely to get out of order than, and not so easily adjusted, as the arrangement of the arms to work, as described.

But I claim the arrangement and application of the arms, F F, substantially as described, between the packing rings and a movable center bearing, whether the said center bearing be movable, to adjust or tighten the packing by means of a central rod passing through a hollow rod, or by other means.

[Mr. Pettis' improvement is intended to enable the engineer to tighten the packing of the piston, without going to the trouble of removing the cylinder head and various other appurtenances. This is done by making the piston rod hollow and passing a solid rod down its center to the piston head. The packing is metallic; within the head are four arms, connected by joints at one end with the packing, and at the other with the central rod before named; by raising or lowering the rod the packing will be loosened or tightened; the engineer, therefore, when he desires to move the packing, merely turns a nut at the top of the piston rod. The advantages of this improvement are obvious.]

CUTTING CLOAKS—A. S. Thompson, of Alton, Pa.: I claim cutting a cloak from a seamless cloth, without sleeves, but so that by making four cuts of the proper length for the sleeves, the cloak may be worn as a sleeved sack or overcoat, by merely changing the buttonings, substantially in the manner described.

HARVESTER RAKERS—John W. Haggard & Geo. Bull, of Bloomington, Ill., assignors to Bull, Haggard, & Newsteter, of same place: We claim the plate o, having its incised and parallel planes on the same sides, in combination with the pin, z, bar, J, spring, l, and pin, R, the whole being constructed, arranged, and operating as described.

ROTARY PUMPS—C. D. Wright, of Fort Atkinson, Wis.: I claim the construction of the pump as shown, viz., having the hollow sphere, C, placed within an inclined or oblique shell, B, which forms the body of the pump, the sphere being attached to a hollow shaft, E, at one side, and communicating with a section pipe, A, at its opposite side, two opposite sides of the sphere fitting in concaves, a, in the side of the shell, the sphere being also divided into two compartments, b c, one of which, c, communicates with the suction pipe, A, and the other, b, with the force pipe or hollow shell, E, the sphere having a flanch, D, attached to it, which divides the shell or body, B, into two compartments, e f, and the flanch having a piston, G, working in it, at each side of which, apertures, B, are made in the sphere, C, the above parts being arranged substantially as shown, and for the purposes specified.

[In this improvement a hollow sphere having two compartments is fitted within a shell placed in an oblique position, the shell being attached to a hollow shaft, which serves as a suction pipe, the sphere also attached to another hollow shaft, which serves as an exit pipe. The sphere has a flanch around it; which divides the shell into two compartments, and the flanch is provided with a piston operating in such a manner that as the hollow sphere rotates, the water is drawn through the suction pipe into one compartment of the sphere and forced into the other compartment, and through the exit pipe. The pump operates with but little friction, is simple, and may be cheaply manufactured.]

RUBBING TYPES.—Daniel Moore, of Brooklyn, N. Y., assignor to Geo. S. Cameron, of Charleston, S. C., James H. McWilliams, of New York City, and Daniel Moore, aforesaid: I claim, first, constructing the slice, i, with openings to receive the type at such an angle, relatively, with the direction which said slices move, that the cutters shall commence to act at the latter end of the type, carried by said slices and that the cutting operation shall tend to force the type into the bottom of said angle and thereby retain the type in place in said slice in the manner and for the purposes specified.

Second, I claim constructing the slice, i, in such a manner, as at v, that the power to force the type in an endways direction, or nearly so, through the cutters, shall be applied to, or near the middle of the bottom end of the type, in the manner and as specified.

Third, I claim the follower of slides, 8, and holding plate, 9, to supply the machine with a line of type, in the manner, and as specified.

Fourth, I claim the lifter, 12, combined with the gauge fingers, t, and end of the plate, 9, or other stop, for the purpose of elevating one type at a time, to be taken by the slices as specified.

VARIABLE CUT-OFF GEAR FOR STEAM ENGINES—Wm. W. Wade, of Springfield, Mass., assignor to Wade & Burnham, of same place: I claim the arrangement of the induction and cut-off cams upon two parallel shafts, to operate in a yoke frame containing two separate yokes, one before the other, substantially as described.

[This invention consists in certain improved mechanism by which such a movement may be given to a common single slide valve as to make it cut off the steam at any point, from one-eighth to seven-eighths of the stroke. It is a very good improvement, and reflects credit on the inventor. Without drawings its parts cannot be well described.]

RE-ISSUES.

MORTISING MACHINES—Jos. Guild, of Cincinnati, O., Patented originally Nov. 30, 1852: I claim, first, the sliding wrist, o, connected with the chisel, and also with the driving power, in the manner described, in combination with the mechanism described, or its equivalent for sliding said wrist, so that the operator can, during the motion of the machine, vary the depth of cut of the chisel, or cause it to be suspended without disconnecting the driving power.

Secondly, the combination in a mortising machine, substantially as described, of treadle and opposing spring, or weight, connected to a toggle, one end of which being pivoted to the frame, the other is pivoted to a sliding wrist upon a vibrating arm actuated by the power, the said wrist being slid out and in upon the arm with varying power and speed by the action of said toggle and its attached weight, or spring, and treadle, as explained, or their equivalents.

REAPING AND MOWING MACHINES—Saml. Rockafellow, of Coatsville, Pa. Patented July 3, 1855: I claim raising and depressing the finger bar, K, and consequently the cutter, e f, by means of the vertical bars, M M, having wheels, o o, at their lower ends, arm, P, attached to the cross piece, N, of the bars, M M, lever, Q, and shaft, R, with its arm, S, attached, the above parts being arranged substantially as shown and described.

I also claim supporting the ends of the stationary cutters, e, by means of the sockets or their equivalents in the knobs or projections, d, of the fingers, c, substantially, and for the purpose set forth and described.

DESIGNS.

PARLOR STOVES—Conrad Harris & Paul W. Zoiner, of Cincinnati, O.: Design for wood stove named "Parlor Gem."

CLOCK FRAMES—Jonathan C. Brown, of Bristol, Conn.: I claim the combination of the octagon form with the oval corner, as distinguished from some other form.

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PARLOR STOVES—Conrad Harris & Paul W. Zoiner, of Cincinnati, O. : Design for a parlor stove named "Carbon."

SIX PLATE BOX STOVES—Conrad Harris & Paul W. Zoiner, of Cincinnati, O.

COOKING STOVE—Conrad Harris & Paul W. Zoiner, of Cinoinnati, O. Design named "Kanzas."

STRAP HINGES—Enoch Woolman, of Damascoville, O.

NOTE—About one-third of all the American patents granted last week were obtained through the Scientific American Patent Agency. Several of the grants are for inventions of a very valuable and important nature, from which rapid fortunes will be made. To those who are longing to elevate themselves in the world, pecuniarily, we say invent, invent, invent! There is not a surer way to business and fortune for individuals who are without capital, than patents. A good invention generally yields a cash return, and is often of more value than a California gold mine.

The present is an unusually favorable time for applying for patents. The Hon. Charles Mason is again in power, and the business of the Patent Office is being once more conducted with promptness and vigor. Applicants will not have to wait so long as formerly, before the result of their cases is made known.

Prince Albert on Science and Common Sense.

On the 22d of last month, at the laying of the corner-stone of the new edifice of the Birmingham Institute, England, Prince Albert—who was present, and whose health was drank at the dinner given on the occasion—made a speech, in which he, very sensibly, never alluded to the war, nor to political matters, but exclusively to the objects for which the building was designed, namely, scientific instruction. He said it was a pleasure for him to participate in a work of worldly wisdom in that great town, because it was one of the first public acknowledgments of a principle daily forcing its way among the people of Britain, and destined to play an important part in its future developement (and the world in general,) viz., the introduction of science and art as the conscious regulators of human industry. The following short extracts from his speech are worthy of being engraved in letters of gold :

"In all our operations, whether agricultural or manufacturing, it is not we who operate, but the laws of nature, which we have set in operation. It is, then, of the highest importance that we should know these laws, in order to know what we are about, and the reason why certain things are, which occur daily under our hands, and what course we are to pursue in regard to them. Without such knowledge we merely go on to do things just as our fathers did, and for no better reason than because they did so—or improve upon certain processes by an experience hardly earned and dearly bought, and which, after all, can only embrace a comparatively short space of time, and a small number of experiments. From none of these causes can we hope for much progress; for the mind however ingenious, has no materials to work with, and remains in presence of phenomena, the cause of which are hidden from it. . . . . .

But these laws of nature—these Divine laws—are capable of being discovered and understood, and of being taught and made our own. This is the task of science; and while science discovers and teaches these laws, art teaches their application. No pursuit is, therefore, too insignificant not to be capable of becoming the subject both of a science and and art. . . . . .

No human pursuits make any material progress until science be brought to bear upon them. We have seen many of them slumber for centuries; but from the moment that science has touched them with her magic wand, they have sprung forward and taken strides which amaze and almost awe the beholder. Look at the transformation which has gone on around us since the laws of gravitation, electricity, magnetism, and the expansive power of heat have become known to us! It has altered our whole state of existence—one might say the whole face of the globe! We owe this to science, and science alone; and she has other treasures in store for us, if we will but call her to our assistance. It is sometimes objected by the ignorant that science is uncertain and changeable; and they point to the many exploded theories which have been superseded by others, as a proof that the present knowledge may be also unsound, and after all not worth having. But they are not aware that while they think to cast blame upon science, they bestow, in fact, the highest praise upon her. For that is precisely the difference between science and prejudice; that the latter keeps stubbornly to its position, whether disproved or not, while the former is an unarrestable movement toward the fountain of truth—caring little for cherished authorities or sentiments, but continually progressing—feeling no false shame at her shortcomings, but, on the contrary, the highest pleasure when freed from an error, at having advanced another step towards the attainment of Divine truth. . .

We also hear, not unfrequently, science and practice, scientific knowledge and common sense, contrasted as antagonistic. A strange error! For science is eminently practical, and must be so, as she sees and knows what she is doing; while mere common practice is condemned to work in the dark, applying natural ingenuity to unknown powers, to obtain a known result. Far be it from me to undervalue the creative power of genius, or to trea rewd common wose as thousenwihle ttrss st knowledge. But nobody will tell me that the same genius would not take an incomparably higher flight if supplied with all the means which knowledge can impart, or that common sense does not become only truly powerful when in possession of the materials upon which judgment is to be exercised. . . . . .

No pursuit is too insignificant not to be capable of becoming the subjects both of a science and an art. The fine arts, as far as they relate to painting and sculpture (which are sometimes confounded with art in general) rest on the applicatiou of the laws of formand labor, and what may be called the science of the beautiful. They do not rest on any arbitrary theory on the modes of producing pleasurable emotions, but follow fixed laws, more difficult, perhaps, to seize than those regulating the material world, because belonging partly to the sphere of the ideal and our spiritual essence, yet perfectly appreciable and teachable, both abstractly and historically, from the works of different ages and nations." (Cheers.)

Recent Foreign Inventions.

JOINING SLABS OF SHEET-IRON—A patent has been granted to Mr. Bertram, a practical engineer, employed in Woolwich Dockyard, Eng., as foreman. His invention consists of a process of firmly joining together slabs of sheet-iron work for the purpose of making boilers, building ships, and erecting bridges, &c., without the use of rivets. This novel method of welding the iron instead of joining it by the rough means hitherto in use—that of riveting—is carried out by fusing the two edges of the plates to be adhered, and striking them simultaneously on both sides. By this means the structure is rendered materially lighter, and much stronger. Some experiments have been tested by order of the Lords of the Admiralty, in presence of the officers of the Dockyard, who are authorized to report thereon. The result of their deliberations will shortly be made known. It has been hitherto considered impossible to make an unlimited surface of iron; hence the system of riveting has been so far perpetuated.

A NEW EXPANSIVE VALVE MOTION FOR STEAM ENGINES was lately described at the Institution of Mechanical Engineers, by Mr. G. M. Miller, of Dublin. In this motion a single eccentric only is used on the driving axle; this works the rod of one of the valves direct, and the rod of the second valve is worked by the eccentric through the intervention of a loose ring on the driving axle, having two arms projecting at right angles to each other, to one of which the second valve-rod is attached, the other arm being connected with the eccentric. By this means a similar motion is given to both valves, but corresponding to the relative positions of the two cranks at right angles to each other. The eccentric is molded upon a transverse slide, which is capable of being moved backwards and forwards across the axle by means of a handle, answering to the ordinary reversing handle or lever, and acting through the medium of a pair of racks and pinions. By moving the transverse slides the throw of the eccentric is altered or reversed, thereby enabling the engine to be worked expansively or reversed. A model of the new motion was exhibited, showing it as applied to a locomotive engine; and the particulars were given of the successful working of the new motion in two engines upon the Great Southern and Western Railway of Ireland.—[Railway Gazette, London.

STEAM ENGINES—Mr. T. W. Bunning, C. E., of Nowcastle-on-Tyne, has patented some improvements in steam engines, which consist of an arrangement of trunk-engines in which the steam from the boiler is only admitted under the piston to perform the up-stroke, while it is made to enter through a slide of a particular construction into the upper part of the cylinder, there to work expansively and perform the down-stroke.

FURNACES—T. R. Crampton, C. E., of London, has patented an improvement in locomotive and other boiler furnaces, which consists in employing a series of flat bars arranged transversely in a furnace of a steam boiler, one bar below another, and somewhat forward of each other, thus producing a shelving grating, with spaces for the passage of air horizontally between the bars. At the lower part of such series of shelving bars is a series of ordinary fire bars, which receive the well-ignited fuel descending down the shelving bars, and which are so connected with an axis as to allow fire to be dropped upon them when desired.

Bursting of Krupp's Steel and Iron Cannon.

On page 98, in our list of claims of the 27th ult., two of the claims were embraced in a patent granted to Alfred Krupp, of Essen, Prussia. The first was for the manufacture of cannons from solid pieces of steel, and the second was for the surrounding of cannons made of cast steel with cast, or wrought iron, or gun metal.

We have learned, by recent foreign exchanges, that on the 19th of last month, at the Royal Arsenal, Woolwich, England, a number of scientific gentlemen assembled to witness the testing of one of these guns, a 68 pounder, manufactured by Krupp, in Prussia, for Capt. Creuse, royal engineer. It was supposed to be the largest piece of cast steel ever manufactured, and weighed between three and four tuns. The chemise, or outward covering of cast iron brought its weight to nine tuns. The proof charge was 25 lbs. of gunpowder, one wad, and one of the projectiles made by the inventor and intended for service with the gun. This shot was of a conical shape, about two feet in length, weighing 2 cwt., 1 quarter, and 7 lbs. The quantity of powder used was less than the proof charge of an ordinary 68 pounder by 3 pounds. At the first discharge the gun burst, scattering the fragments high into the air. The sensation of the result was very great, as some supposed it capable of resisting any amount of powder. Its declared value was £1500—$7500

Great Steamship Launched.

On the morning of the 10th inst. the new steamship *C. Vanderbilt* was launched from the yard of R. Simonson, at Greenpoint, amid the acclamations of a dense crowd numbering some thousands of persons, some of whom had come from a great distance to witness the descent of this noble vessel into the briny element. The launch was very successful. The vast size of this new leviathan of the deep was not properly appreciated because of her fine lines, until she was about to be towed down to the dock to get on her sheathing. Four tolerable sized "tugs"—two on each side—appeared beside her, like dog-fish beside a whale. The *C. Vanderbilt* is designed for the Atlantic trade between this port and Havre. She is built very strong, and of a capacity amounting to five thousand tuns. Her engines will be of the common over-head beams. They are nearly finished, at the Allaire Works, and are of huge proportions. The *Vanderbilt* is the largest steamship yet launched on our continent

Granite Dust.

A correspondent of the Washington *Intelligencer* says :—"While examining the granite quarries at Northbridge, Mass., a few days since, I had a conversation with the workmen who were dressing out the stone, in reference to the dust that they were rapping off with a flat piece of board from the face of the stone they were hammering. The dust is reduced in the hammering of the stone to an impalpable powder, and will float in the air. I said to them that it would be well to try the vegetating powers of this granite dust in a hill of corn. They replied that it had been used in gardens and on grass lands with great success, and that it was equal to the best manure. The granite rocks may be ground to an impalpable powder and used as a fertilizer. Feldspar, a component of granite, yields potash, and may therefore be supposed to possess extraordinary fertilizing power."

French Single Horizontal Steam Engines.

Wm. Fairbairn, of Manchester, Eng.,—the famous engineer—in his report of the steam engines on exhibition in Paris, states that the horizontal *single* cylinder engine is gaining ground on the double cylinder vertical engine. He attributes this to its being both cheaper and more compact. At one time the great objection to horizontal engines was the excessive unequal wear of the piston upon the lower side of the cylinder; but owing to the accuracy with which pistons, are now made, the wear and tear upon cylinders is greatly reduced. In France, Mr. Fairbairn states, the consumption of coal per horse power, in the most common steam engines, is very low—only about three pounds, and the makers of them guarantee that they will not exceed that amount. The steam is used at about fifty pounds pressure on the square inch, and is cut off at one-fifth of the stroke, and so far as economy of fuel is concerned they are equal to an engine with two cylinders, the one for high pressure, and the other for expansion—the well known Wolfe principle, which has been held to be the most economical of all. Mr. Fairbairn states that the improvements in French engines, although well known in England have not been carried out to the same extent as in the former country. He therefore awards high praise to the French engineers, and certainly, when we consider the economy of fuel—3 lbs. of coal per horse power an hour—in their engines, we must call upon our own engineers to spur up and useless fuel than they heretofore have been accustomed to do.

English Scientific Journal.

We understand from undoubted sources that a new scientific and mechanical journal is about to be established in London, adopting the SCIENTIFIC AMERICAN as the standard. We are not permitted to announce the names of its projectors, but they are men of enterprise, and occupy high positions in the scientific circles of London, with almost unequalled advantages for a work of this character. So far as we know—and we believe we understand the subject thoroughly—there is not a first-class journal of the kind in London. They are generally monthlies or weeklies, without force or energy, and the opening for a good journal is, no doubt, very encouraging.

Terrible Effects of Conical Balls.

An English surgeon—Mr. Longmore—writing to the London *Daily News* from the Crimea, says :—

"The experience of French practice, as well as our own is, that patients scarcely ever recover with compound fractures of the thigh, caused by rifle shots in the upper part of the limb, whether amputation be performed or not. This has led both the French and ourselves to make some experiments in cutting out some portions of the bone broken and killed by the injury, leaving the limb on; hoping that while one source of irritation is thus removed, and a less severe shock to the frame is caused than by lopping off the whole limb near the hip, nature may in time restore the continuality of the detached ends by throwing out new bones. There have not been sufficient cases to warrant conclusions on the propriety of this proceeding in the thigh. In no previous war has the human frame been shattered by missiles projected with such force as in this, and the conical form in the balls has caused a considerable difference in the kind of fissuring and splitting up of the bones."

Frantz's Wind Mill.

In the description of the Wind Mill in No. 13, SCIENTIFIC AMERICAN, it was stated that Phillips & Tritle were the assignees of the patent. The patent was assigned to Mr. John Phillips solely, by the inventor,—Phillips & Tritle manufacture the Wind Mills.

Fermentation.

French grape juice, which ferments spontaneously in contact with the atmosphere, if put up in a glass jar, free from contact with the air, will not ferment. This was discovered by Gay Lussac.

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