Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS.

VOLUME XI. NEW-YORK, NOVEMBER 17, 1855. NUMBER 10.

THE
Scientific American,
PUBLISHED WEEKLY
At 128 Fulton Street, N. Y. (Sun Buildings.)
BY MUNN & COMPANY.

O. D. MUNN, S. H. WALES, A. E. BEACH.

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Single copies of the paper are on sale at all the periodical stores in this city, Brooklyn, and Jersey City.

TERMS--$2 a-year.—$1 in advance and the remainder in six months.

Improvement in Fire Safes.

The annexed engravings represent the fire-proof metallic Safe for which a patent was granted to Holmes & Butler, of the firm of Messrs. Holmes, Valentine & Butler, Nos. 90 and 92 Maiden Lane, this city, (N. Y.,) on the 28th of March last.

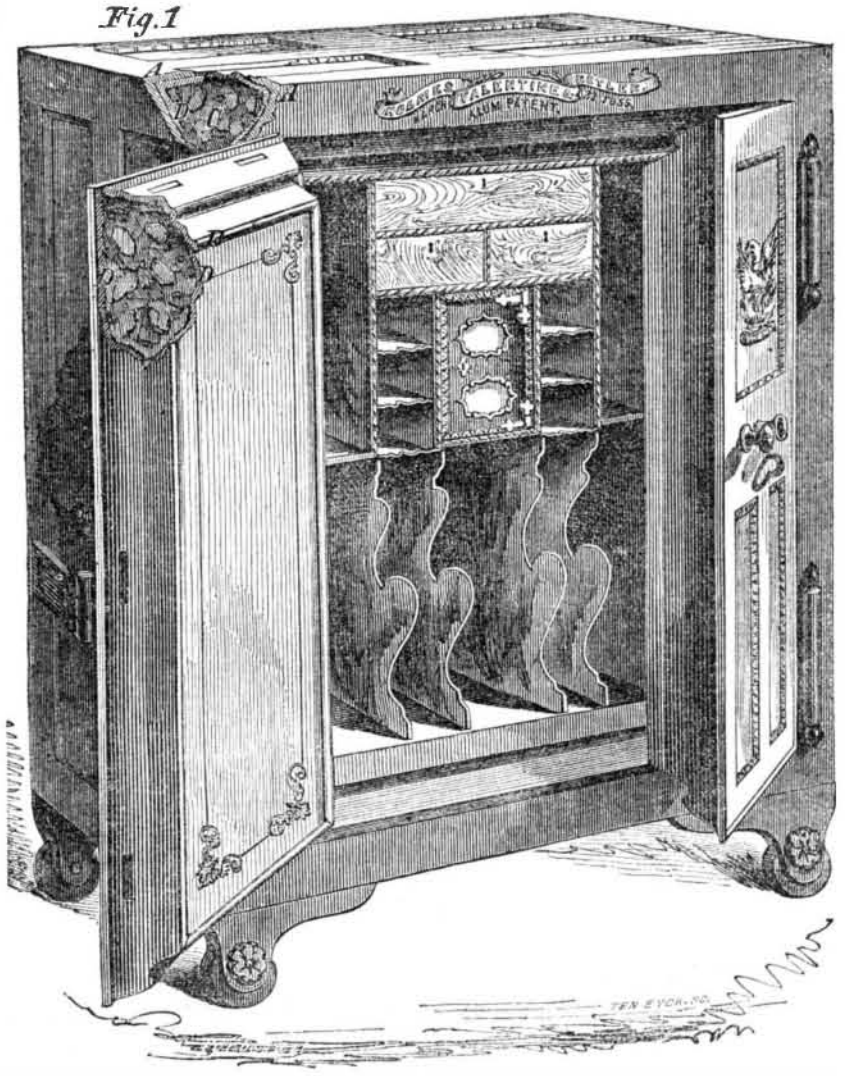
Fig. 1 is a perspective view of one of their safes, showing its interior, with the upper corner of the door, and a top corner broken, to show the lining and the inside of the thick double casing. Fig. 2 is a vertical section of a corner of the casing of the safe, and fig. 3 is plan view of the angle iron strapping, A, which binds the edges of the safe and renders it of great strength to prevent breakage, even if the safe were precipitated from a high upper floor into the cellar of a building, during a conflagration. Similar letters on all the figures refer to like parts.

D represents the outside and inside strong iron castings or walls of the safe—the door, in this respect, being made like the other parts of it. B is a flange on the door which slips into a recess in the walls of the safe; there are also small projecting pieces in the top and bottom of the door which fit into recesses in the walls of the safe when the door is shut, so as to render all the parts nearly as snug and firm as if the whole were one casting. A is the angle wrought-iron strapping piece of the edges of the safe; it is shown in fig. 3 as the binding of one corner, E, of the safe. Other safes, without such angle iron strapping, are liable to burst to pieces on falling from upper floors during fires, thus rendering nuginatory all their fire-proof qualities The space between the outer and inner casing or walls of the safe is filled with an incombustible substance which prevents the casing, and especially the interior from becoming highly heated when exposed to an intense fire, thus preserving books, valuable papers, &c., contained in it, from being burned and injured. The best fire-proof substance or substances for safe-filling is a desideratum, because this is the very thing on which their *chief* value depends. The older safes made some years since, were lined with incombustible anhydrous substances, such as fire-brick, pumice stone, &c. They were almost worthless, because when exposed for a long time to a fire they became heated throughout, and everything within them was burned. An improvement in such filling was the substitution of a hydrous substance like gypsum. An improvement on the use of gypsum simply was made, by the use of alum as part of a compound with clay and other incombustible substances. Common alum contains 24 H.O. water while gypsum contains only 2 H.O. Safes filled with alum or gypsum compounds, when exposed to a high heat, evaporate some of their water of crystallization and convert it into vapor, which contains a great deal of latent heat, and but a low specific heat, which tends to preserve the casing from becoming highly heated, even when exposed to an intense fire. The defect connected with this particular filling is stated to have been a liberation of some of the sulphuric acid of the alum and the gypsum with the vapor, which was liable to find its way through the expanded seams of the casing among the papers, acting chemically on the writing, obliterating it more or less, and also injuring fine articles of jewelry, &c. Another defect was, that when the water of the filling was thus partly expelled, in the state of vapor, the lining, especially the sulphate of alumina, contracted its bulk, leaving a free space or spaces between the under and upper casings of the top and sides, thus allowing the fire to act powerfully on the outer casing, and at last transmit the intense heat through the mass.—The aluminous filling, containing so much water, was also liable to become fluid, sink down into the lowest part of the safe, and ooze through the seams, finding its way outward, also into the interior, destroying the contents, with which it came in contact, and leaving the upper part of the safe empty and exposed to the action of the fire.

To remedy these defects in the filling of safes, was the object of the patentees of this safe, and it was for this improvement the patent was granted. They employ a compound of clay, or any other earthy incombustible substance, such as soapstone, pumice stone, &c., and the alum of commerce and an alkali. The latter substance—the alkali—is used to neutralize the free acid that may be generated when the safe is exposed to fire, and thus to prevent any injury to the contents of the safe from such a cause. In order to prevent the filling of the safe settling down when it shrinks or becomes fluid—whereby the outer casing would be exposed to the dangerous action of the fire—they pack their filling interspersing it with irregular-shaped pieces of porous unshrinking brick, as shown, the pieces touching one another at points, and also resting against the sides of the plates. This method of filling the fire-proof space converts it into a series of cells, preventing the incombustible filling from settling and from running down, keeps it close to the casing and forms a cellular fire-proof tissue which most effectually resists the action of the heat. All the interior seams are also lined with strips of thick felt boiled in a strong solution of alum, so as to prevent the outlet of vapor or fluid matter, and the utmost care is exercised to render the safe as perfectly fire-proof as possible.

PATENT PORTABLE FIRE-PROOF SAFES.

Fig. 1



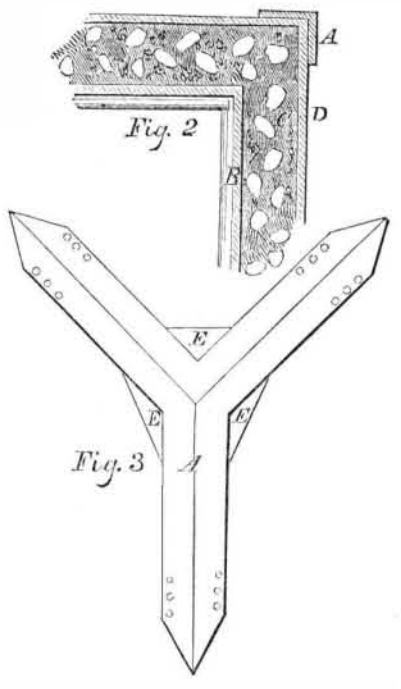


Fig. 2

Fig. 3

The use of safes has become wonderfully extended during the past few years, and many large companies are now engaged in their manufacture in nearly all the principal cities of the Union Their value is now much better appreciated, still, they are far from being as extensively used as they should be.—Every warehouse, store, and gentleman's dwelling should be provided with one.—Various sizes of them are made—large ones for banks, stores, offices, &c., and small ones for private dwellings. There are few persons who have not valuable papers and other things which they desire to have protected from fire and burglars, and these safes are the very means of doing this.

The inferior construction of safes a few years ago, and the huge keys required for their locks, were serious obstacles to their general use. The above illustrated safe has a fire and burglar-proof lock on it, with a key so neat and small that it might be carried in a lady's thimble, and still it answers just as good a purpose as one of the old keys, which was large enough to fell an ox. These safes are tastefully executed, and resemble an ornamental piece of furniture, and being placed on wheels can easily be moved.

Although pieces of porous brick are employed, as described, in the safe, by Messrs. Holmes, Valentine & Butler, still, these are not positively necessary, as they can pack their safes with their fire-proof composition in snch a manner as to prevent any contraction, or falling down of the filling, under the most severe tests. Common safes, owing to the kind of filling used in them, are liable to become damp, and for this reason they are not suitable, especially for containing fine jewelry, &c., as dampness injures such articles. The filling used for these safes generates no dampness, and they are warranted to keep perfectly dry in every case, which is a very important feature in their construction. Those who have tested various kinds of safes, know the value of having a perfectly dry one.

Messrs. Holmes, Valentine, & Butler constructed the safe which stood 24 hours roasting in the furnace at the great trial which took place in the Crystal Palace in Dec. 1853—the contents of the other safe being wholly destroyed, while all the books in theirs (except the backs of two, which were slightly scorched) were taken out in good condition. The patentees conduct an extensive business, and their safes have obtained a wide-spread celebrity.

More information may be obtained respecting them by letter (or otherwise) addressed to the manufacturing warehouse, Nos. 90 and 92 Maiden Lane, and W.G. Holmes is now in Chicago, Ill., where the company has an office.

Using the Power of Distant Waterfalls.

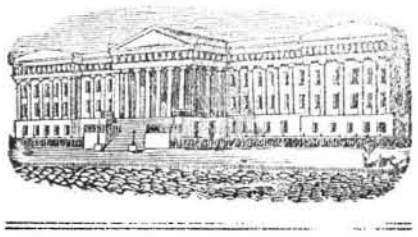
MESSRS. EDITORS—I was gratified to see you notice the suggestion of a correspondent in regard to the storming of Sevastopol, as possibly people may be benefitted by suggestions, and in view of this I wish to say that the time is not far distant when the power that can and will be obtained from the falls of Niagara will be transmitted to Black Rock and Buffalo by coupling shafts, giving power enough to accommodate the wants of all. The power from the falls below Rochester will be used in the same manner. I had rather have stock in either of such enterprises than many of the railroads under contemplation.. S. AVERY.

Weedsport, N. Y., Nov. 2, 1855.

[The last time we were at Niagara, (1846,) we came to the conclusion that *there* was a vast mechanical power running to waste. We think the project of our correspondent will not soon be carried out, still the thing is not impossible. But large manufacturing villages near the falls, for the purpose of employing the water power, by short lines of shafting, would be a far better plan of using that power than long shafting running to Black Rock or Buffalo.

Caution to Mechanics.

A merchant in Mobile, Ala., has brought suit against a shoemaker, for failing to comply with a promise to have a pair of boots made at a specified time.



[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING NOV. 6, 1855.

MARBLE SAWING MACHINES—R. G. Pine, of Newark, N. J.: I claim the frame, B, connected by jointed rods, f n, to rods, d d, working in sockets, b b, which are fitted loosely on rods, a, when the above parts are all constructed and arranged in the manner and for the purpose set forth.

[The nature of this improvement consists in attaching the saws to rods which operate through adjustable guide pieces. The latter are movable by means of set screws, so that the angle at which the saws cut may be regulated at pleasure and very quickly.

This invention is the type of a large number of others, all intended for the same purpose. It will apparently work in practice, and cut two tapering sides of a block at once. Howgood it will operate, however, or whether better than some of the other machines, remains to be ascertained by actual trial

A very large number of applications for patents on marble saws have been made, and many of them have come up for examination at the Patent Office. They conflict with each other pretty generally,as we precicted would be the case. There are few of the applications but are adjudged by the Commissioner of Patents to interfere with others, and from fifteen to twenty different cases are frequently given in reference. Amid such a scramble for the prize it is doubtful whether any one gets it. Like the leg of mutton among the dogs, scarce a mouthful will be left for any of them. Great business, this marble sawing !]

CHAIN LOCKER PIPES—Charles Perley, of New York City: I claim the locking piece, f, constructed substantially as specified, and applied to the chain locker pipe, in the manner and for the purposes set forth: and in combination with said locking piece, f, and flanches, c and d, I claim the cover, g, for the purposes and as specified.

STEAM BOILERS—H. N. Pettengill, of Rockford, Ill.: I do not claim any one of the several parts described; but I claim the arrangement of the flues, C and E, the water chambers, H H, and projections, I and I', with the feed water pipes, J and J', combined in the manner and for the purpose set forth.

ROTARY STEAM ENGINES—Elias Matteson, of Dayton N. Y., W. M. Parris, of Dorset, Vt., and Hervey Parris of Pawlet, Vt.: We do not wish to confine ourselves to any particular number of steam chambers; nor to any particular number of pistons in a steam chamber; nor do we wish to confine ourselves to slotted abutments, for we do not consider it will alter the nature of our invention, whether the pistons pass the abutments by slots in the same, or by slots in the steam wheel.

But we claim, first, the cut-off crank, Z, and anti-friction roller, X, in combination with the ellipse, D, and balance beam, N, when so constructed as to alternately open and close the cut-off valves, substantially as described, and for the purpose of effecting an adjustable cut-off.

Second, we claim the air spring to steam wheels, when so constructed as to have direct influence on the steam piston, and by its reciprocal action, to maintain a steady, even motion of the engine, when in unison with the cut-off, in the manner and for the purpose substantially as described.

MACHINES FOR SAWING MARBLE—Henry Burt, of Newark, N. J.: I am aware that different adjustable apparatus have been used for sawing wood, and that horizontal saw frames have been used for sawing stone into square blocks, parallelograms, thin slabs, &c. Also connections of various kinds have been used. I do not, therefore, claim the above devices separately.

But I claim the combination of the saw frame, B B', pivoted, swinging, adjustable guide frames, A A', and connection rods, d d', arranged and operated in the manner and for the purpose set forth.

HEATING AIR FOR BLAST FURNACES—Thos. W. Bakewell, of Cincinnati, O.: I do not claim the introduction to furnaces of heated air or steam by itself, either separately or combined.

But I claim the heating of air to supply furnaces by bringing the escape steam of an engine into direct and intimate contact therewith in a suitable vessel, separate from the furnace and previously to its admission thereto, substantially in the manner set forth.

[By this improvement the furnace fire is supplied with heated instead of cold air, the object being to save fuel. The invention consists in heating the air by bringing it in direct contact and mixing it with, the escape steam from an engine, in a vessel common to both. The air is driven into the said vessel by a fan, and the resulting water of condensation is carried off to the force pump by a pipe provided for the purpose. The inventor claims to effect a considerable saving in fuel. There is no difficulty about the introduction and use of his method; nor is the expense of its adaptation very much. It appears to be a useful invention.]

WHIFFLETREES—George C. Barney, of Brookline Mass.: I claim making the whiffletree in two parts, in the manner essentially as described, and connecting them together and to the cross bar of the shafts by devices or means, substantially as specified, whereby results as explained may be attained.

BENCH PLANE IRON—I. Henry A. Bleckmann, of Ronsdorf, Prussia: I claim the placing of a piece or a plate of steel between plates of iron forming a plane iron for the purpose and in the manner above described.

LATH MACHINE—Andrew Blaikie & Walter Clark, of St. Clair, Mich.: We do not claim, separately, the feed rollers, for they are in common use.

But we claim the arrangement of the saw, D, separating plate, J, deflecting or guide plates, j, and feed rollers, E E', for the purpose specified.

[The lath stuff is fed up to the circular saw by means of feed rollers, in the usual manner. Behind the saw there is an upright stationary knife edge or wedge, which opens the kerf and causes the lath to fall off one side into a box, while the stuff falls off on the other side upon an inclined plane, down which it slides by its own gravity, back to the feet of the operator, ready to go through the machine again. This self-acting return movement of the stuff is a great convenience, and saves considerable labor. The improvement is a good one, and so simple that it will no doubt be extensively introduced.]

AUTOMATIC LUBRICATORS FOR RAILROAD AXLES—Michael Egan, of Ogdensburgh, N. Y.: I do not claim, in general terms, feeding oil to the axle by intermittent motion of the feeder or feeders, produced by the revolution of the axle or otherwise. Neither do I claim the employment of a feeder, which, by either constant or intermittent motion, receives oil from a reservoir below and deposits it on the axle.

I claim the arm, B, placed under the bearing, and made to descend into the grease and rise to the journal at each revolution of the axle, by being connected to the eccentric, D, or its equivalent, substantially as set forth.

COMPOSITION FOR KINDLING FIRES—Bernard O'Reilly, of New York City: I claim the fire-lighting compound formed by the admixture of the several ingredients specified, in the manner, and in about the proportions set forth.

[This compound is intended for use in cities, and wherever a blaze is wanted for lighting fires in stoves, &c. Paper is very frequently used, at present, for the purpose. The mixture is made up of turpentine, powdered charcoal, gum olibanum and camphor, combined in certain proportions. It is kneaded into small lozenges, one of which is sufficient to light a fire, as it will burn for quite a little while, and produce an intense flame. This is a very excellent fire-lighting material.]

KNITTING MACHINES—Arasmus French, of Waterbury, Conn.: I claim the combination of the eye-pointed needle, D, with the hoop, a a, when constructed, arranged, and made to operate substantially as described.

Second, I claim the method of opening and closing the clamps, d d d d, for holding the hoops, a a, by the use of the cams or wedges on the circle, B, when worked by the same eccentric which works the needle when the whole is constructed and made to operate, substantially as described.

Third, I also claim the method of narrowing by giving a longitudinal motion to the arch bar, F, when constructed, arranged, and made to operate substantially as described.

WASHING MACHINES—Daniel Haldeman, of Morgantown, Va.: I claim the combination of the hin ed arms, crank shaft, restraining hooks and rubbing board, for the purpose of holding and operating said rubbing board in its proper position whilst washing, and to enable the operator to raise it out of the machine, to replace the clothes by simply throwing back the restraining hooks and drawing the shaft, still pivoted to the arms, towards the end of the machine, as set forth.

SELF-ACTING MULES—John Harris, of Lawrence, Mass.: I do not claim combining with mechanism for producing a regular backing-off movement of the carriage machinery, not only for giving a slow motion to it during the first part of its running-in movement, or while the "fuller" is descending on the yarn, a quicker movement afterwards, or while the carriage is running in, but finally a slower movement, decreasing to completion, of the extent of inward movement of the carriage.

But I claim the peculiar combination before described and applied to the endless chain, and for effecting such variable movement or running in of the carriage, the same consisting of the driving shaft, G, the clutch apparatus thereof, the barrel gear, I, the eccentric gear, M, and mechanism connecting the latter with the shaft, E, of the endless chain, the whole being arranged and applied, substantially as specified, to the mechanism for producing regular movement of the chain in a reverse direction.

BRICK MACHINES—Alex. H. Brown, of Washington, D. C.: I claim, first, the combination of the outside plungers with the skeleton wheel, inside plunger, and molds, when arranged and operated as set forth, and not otherwise.

Second, I claim discharging the bricks by means of the ratchet stock, K, vertical bars, P P, and inside plungers, E, when arranged and operated as described, and not otherwise.

Third, I claim the mode of regulating the amount of feed through the action of the quadrants upon the inside plungers, when arranged as described.

Fourth, I also claim regulating the movement of the skeleton wheel, C, fig. 1, upon the lower plunger when arranged as described.

ARRANGEMENT OF TWO BEAM ENGINES WITH PARALLEL SHAFTS—Thomas Doyle, of New York City: I claim the arrangement of two beam engines in line with their cylinders contiguous to each other, and the connection of the piston ends of the beams by an intermediate beam, C, substantially as, and for the purpose set forth.

[The walking-beam engine is doubtless well known to all our readers, for it is in common use on board of American steam vessels of every kind. If the reader will imagine three of these engines placed one after the other, in "Indian file," as the boys say, he will have an accurate idea of Mr. Doyle's improvement. The invention consists in connecting all the three engines together, in such a way that their movements are regulated, and the power properly equalized. The object is to drive two pairs of paddle wheels simultaneously. Two steam cylinders are employed; the central engine is connected at one of its beam ends to the piston of one of the cylinders, and at the other end to the other piston. The remaining engines connect respectively with the central engine from which they receive motion.]

LOCKS—D. W. G. Humphrey, of Gray, Me.: I claim the indicator, A, movable ward plate, B, and lever, E, arranged and operating in the manner set forth.

GAS HOLDERS—Stephen Hill & Wm. J. Wood, of Rochester, N. Y.: We claim the combination of the pipes, T T, with the diaphragm, d, within the gas holder, for the purpose of applying an equable pressure to fill the gas holder with gas, and to expel the gas therefrom.

SAW HORSE—Horace Lane, of Windsor, Vt.: I claim the use of the spur, J, to hold the wood or timber in its place on the saw horse while the sawyer is sawing the wood or timber into fire wood or into short pieces. Also the use of the roller, the ratchet wheel, the lever, the dog and spring, the cord, the pulley wheel, the slide, the arbor, and the groove and spiral spring, combined with the common saw horse, substantially as set forth and for the purposes stated.

I do not make any claim on the common saw horse, but for the improvements on the same as set forth.

SPLITTING LEATHER—Jeremiah A. Marden, of Newburyport, Mass., and Henry A. Butters, of Haverhill, Mass.: We claim combining with the feeding apparatus or mechanism, substantially as described, by which the leather may be restrained in its delivery, so as to effect the reduction of "cockles" as specified.

CUTTER HEAD FOR ROTARY PLANES—Wm. Nixon, of Adrian, Mich: I claim the double bevel of the cutter, in combination with the bevel on that part of the stock or cylinder which is in front of the cutter, so that the stock may act as a cap iron to the cutter, and to clear the shavings, as set forth.

CLOTHES CLAMPS—James Sadgebury, of Philadelphia, Pa.: I do not claim the mechanical principle involved in the operation of this clothes clamp, as it is well known; nor do I claim a clothes clamp, that is made to string upon the line, there being a hole made in the clamp through which the line is passed; nor do I claim a clamp, made to clasp the line by means of springs.

But I claim the grooved button, D, in connection with the grooved protuberances, A B, substantially as set forth.

DRILLNG AND BORING MACHINE—Samuel M. Shryock, of Hopkinsville, Ky.: I claim supporting the rests, n, by rack, F, and pinion, p, of shaft, E, and combining the same with movable and fixed pulleys, G and H, as set forth, as that the rests may be moved upward with any required velocity, or be dropped from the drill, at the will of the operator, during the revolution of the boring shaft, as, and for the purposes specified.

ARRANGING AND FEEDING SCREW BLANKS—Elliot Savage, of East Berlin, Conn.: I claim the combination of the reciprocating slider, the receiver or hopper, and the inclined conductor, the same being arranged and made to operate together, substantially as specified.

I also claim combining the spring presser with the slider and hopper, and so as to cause the slider to operate laterally, with respect to the screw blank, as explained.

SEWING MACHINES—Isaac M. Singer, of New York City: I claim the employment of two eye-pointed needles, carrying its appropriate thread, and the two working in unison, substantially as specified, in combination with a shuttle, or equivalent therefor, to effect the concatenation of the two sets of stitches substantially as specified, and for the purposes set forth.

SOFA LIFE BOATS—Peter Van Zile, S. M. Griffin, and J. W. S. Dey, of New York City: We do not claim, broadly, making a life preserver in such a manner that it may, when out of use for this special purpose, be applied to other useful purposes, either with or without change or modification.

But we claim the structnre set forth, the same consisting of two buoyant parts, so constructed that, when separate they shall each form a settee or sofa, and when united, a life boat, as set forth.

SELF-FEEDING ATMOSPHERIC LUBRICATOR—John Sutton, of New York City: I claim an arrangement of means, constructed on or within the cap or cover, B, (of the reservoir containing the oil, or other lubricating material,) sufficiently distant from the oil to never be in contact with the same, by the adjusting of which the passage or passages leading from the reservoir to the atmosphere, may be entirely or partially opened or closed, at will, thus causing an increase or decrease of the feeding of the oil to the part receiving lubrication. When properly adjusted, the dome, C, may be firmly secured down, when nothing can interfere with the regulating part.

I do not confine myself to the use of the plug, D, and the substance in the space, E, as a hollow or other plug, or equivalents, may be used to produce the same effect; either of which may be used as the part, when placed, may permit, and without altering the principle or mode of feeding described.

DOOR SPRINGS—Amos Westcott, of Syracuse, N. Y.: I claim, in this class of door springs, adjusting the jointed levers substantially as set forth, and also adjusting the pulley, and for the purpose described.

HANGING WINDOW SASHES—J. W. Ross, of Zanesville, O.: I claim attaching the straps, C F, to the sashes, B B', said straps passing in reverse direction around pulleys, b, E, on a shaft, B", in the stile, a, of the casing, A, the pulley, E, being attached permanently to the shaft, B", and the pulley, b, placed loosely upon it, and the pulleys, b E, being connected and disconnected when desired, as shown, the pulley, b, having a pulley, b', attached to it, to which pulley an elastic band, D, is attached, said band being also attached to the sash, B, the above parts being otherwise arranged, substantially as shown and for the purpose set forth.

[This is an improvement in the mode of hanging window sashes without weights, where one sash is made to counterbalance the other. The common method is to have simple pulleys in the upper part of the window frame, with connecting cords, so that when one sash goes up the other comes down. The present invention consists in having double pulleys, which may be connected or disconnected, at pleasure, by means of a clutch, so that when it is desirable, one sash may be raised or lowered independent of the other. The pulleys are placed on the sides of the frames, and the clutches are operated by a thumb button.]

MORTISING MACHNE—Loomis E. Payne & Orris Pier, of Stowe, Vt.: We claim a double semi-circular mortise bit or gouge, arranged so as to clear itself thoroughly in its action, and this in combination with the double eccentric plate, to regulate the motion to and fro of said mortise bit, the whole being combined and operating substantially as set forth.

CHIMNEY CAP—Jno. W. Davies, of Richmond, Va.: I do not claim the cone, or the other parts, separately considered.

But I claim the combination of the cap, E, and the cone, D, with the tubes, A, arranged substantially as described, and for the purposes specified.

RE-ISSUE.

HARVESTING MACHINES—Jonathan Haines, of Pekin, Ill.: I claim, in combination with a frame nearly balanced on its supporting wheels, and a tongue, hinged to said frame, a lever connected to one, and projecting towards the driver's stand or seaton the other, so that the driver, who is the sole conductor of the machine, may, from said stand or seat, raise or depress the cutters at pleasure, during the operation of the machine, for cutting the grain or grass at any suitable hight above the ground, or for passing over any intervening obstacles, substantially as described.

I also claim, in combination with the operative parts of a harvesting machine a conveyor, which first carries the cut grain horizontally across the machine, and then elevates it, so as to discharge the grain into the bed of a wagon driven along side of the machine, when the conveyor or frame is connected to the bed by a flexible joint, in the manner and for the purpose described.

ADDITIONAL IMPROVEMENT.

VENTILATING AND WARMING HOUSES—Henry Ruttan, of Coburg, Canada: I claim to have added to my original patent the foul air receptacle, added to, and connected with the system of ventilation patented to me Decr. 5th, 1848, said receptacle being connected with the vertical passages and ventilating chimneys, substantially in the manner set forth.

DESIGN.

COAL STOVES—Garrettson Smith, & Henry Brown, (assignors to Leibrandt, McDowell, & Co.,) of Philadelphia, Pa.

[Our Foreign Correspondence.]

Interesting Particulars in regard to the Mammoth Steamship "Great Eastern."

LONDON, Nov. 1, 1855.

MESSRS. EDITORS—On my visit to *the* mammoth steamer now building at Blackwall, on the Thames, I was fortunate enough to procure from the engineers and others the following information. Much has been said, although little is known respecting her, especially in the United States.

The vessel is not yet named, though it is rumored she is to be called the *Great Eastern*. She is being built by J. K. Brunel, Esq., the well-known engineer for the Eastern Steam Navigation Company—who have a capital of six million of dollars; their vessels are all designed for the India and Australia trade, and will be four in number, the first being the *Great Eastern*. She will be the largest and most powerful steamship in the world, as will be seen by the following statement of her dimensions:—

Length, 680 feet; breadth, 83 feet; depth from deck to keel, 58 feet; number of decks, 4; length of saloons, 400 feet; hight of saloon between decks, 15 feet; capacity, 27,000 tuns; will carry 18,000 tuns of coals and cargo. She is to have both screw and paddle engines, whose nominal horse power will be: screw, 1,600, paddles, 1,000. Total, 2,600 horse power. Cylinder of screw engine, 4 feet; diameter of cylinder, 84 inches; stroke, 4 feet; cylinders of paddle engines, 4 feet; diameter of paddle engine cylinders, 74 inches; length of stroke, 14 feet 6 inches. Each engine-room will be forty feet long. The screw propeller will be 23 feet in diameter. The paddle wheels have been fixed at sixty feet diameter. Draft of water, loaded, 8 feet; draft of water in ballast, 18 feet. She is to carry six hundred first class passengers and eighteen hundred second class. If used as a transport, she will carry an army of 10,000 men, with all their field equipments. Weight of iron used in construction 7,000 tuns. She is to be built double, having an inner and outer shell of iron plates. The masts are five in number—ship rigged. The steering apparatus consists of two rudders, which, from their power, ought to bring her round. The after rudder is to be placed like an ordinary ship's rudder; the screw will work forward of this rudder; ahead of the screw is to be a second rudder, in form something like a common rudder. The engines will be larger than any hitherto made. They will be placed in different parts of the ship, entirely independent of each other. The vessel will have ten boilers and five smoke pipes. Every boiler can be cut off from its neighbor and used or not, as desired; they will be placed longitudinally along each side of the ship. Some idea of their generative power may be formed when I say that every boiler will have ten furnaces, thus giving to the whole no less than one hundred large fires. An experimental boiler was made previous to deciding upon the one to be adopted. The coal to be used will be anthracite. The vessel will have two paddle wheels in the usual manner, but the paddle engines are to be on the disconnecting principle, that they may be used jointly or separately, so that one or both of the paddle wheels may, if desired, be put in independent motion. Her deck is to be flush; and a promenade deck, twice the length of the famous *Great Britain*, will be available for her passengers. In her external appearance—drawing inference from the working model—I should think the *Great Eastern* would be a splendid ship. She is molded with very fine lines forward and aft, with an elliptical stern. Her speed should average fourteen miles an hour, while her great size ought at all times to prevent her from shipping water. One of the reasons for building her so large is to give her capacity enough for carrying coals for a continuous voyage of twenty-five thousand miles, thereby saving the expense of establishing coal depots, and the time lost by coaling in foreign ports. These items alone are estimated at 40 per cent. of the outlay for the vessel.

In case of accidents she will have many unusual chances. The floor of this ship is to be perfectly flat. The outer and inner plates will be joined to each other by longitudinal webs or girders formed of plates and angle iron. There will be seventeen of these webs on each side of the ship, thus joining the outer and inner skins by means of a number of water tight cells, of such extraordinary strength that they give a rigidity never before communicated to any vessel. Besides these small cells forming the wall, as it were, of the ship, she is being built in seventeen sections—the midship section being first built up to its full altitude, and the iron decks laid—the other sections, fore and aft, being successively built in like manner and jointed to the preceding section. It may, therefore, be said that the ship will consist of a great number of water-tight apartments between the outer and inner skins, and of thirty-two large square compartments in the body of the vessel, not merely nominal divisions, but complete, substantial, water-tight bulkheads, of sufficient strength to bear the pressure of being filled with water. In case of accidentally being broken in two, the separate portions would float, without damage to the cargo contained in the uninjured sections. The outer plates are of inch iron—the inner three-quarter inch iron securely bolted and riveted together. The first plate was laid in May last. A number of the sections are now built; the stern-post is erected, and the riband or outline of the after-part of the ship is already put up. The work is rapidly progressing; at the present time over five hundred men are at work upon the ship in all departments. Should no unforeseen obstacles arise, she will be launched within a year. Owing to her great size she is being built broadside to the river. It is intended to launch her by means of two immense cradles, which will gradually lower her down to low water mark, whence, on the ensuing tide she will be floated off.

J. P. B.

California will yet become a silk, as well as a gold-producing State. Dr. Behr, of San Francisco, has discovered a native silk worm of rare qualities, for spinning fine cocoons.