

UNITED STATES PATENT OFFICE.

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MACHINE FOR PRESSING OR FINISHING BRICK AND TILE AFTER THE SAME HAVE BEEN MOLDED.

Specification of Letters Patent No. 2,271, dated September 30, 1841.

To all whom it may concern:

Be it known that we, JOSEPH B. WILSON, of Malden, in the county of Middlesex and State of Massachusetts, and ALFRED B. CROSSMAN, of Huntington, Suffolk county, in the State of New York, have invented new and useful improvements in machinery for pressing or finishing bricks or tiles after the same have been molded or formed in the ordinary molding-machines, and that the following is a full and exact description of the same, reference being had to the accompanying drawings, which taken in connection herewith, form our specification.

In said specification we have set forth the principles of our improvements, by which they may be distinguished from others of a like character, together with such parts or combinations of the same as we claim and for which we solicit an exclusive property to be secured to us for fourteen years by Letters Patent.

Figure 1, is a plan of one of our brick presses, with one particular kind of our improved molds fitted into it. Fig. 2, is a side elevation of the same on the right handed or working side. Fig. 3, is an elevation of the working end. Figs. 4, 5, 6, 7, 8, are representations of parts detached, which will be hereinafter referred to and explained.

The brick molds which have heretofore been in common use, were generally made of cast iron and formed in one piece or box, or with their sides permanently connected together; and as, generally speaking, in the material used in the manufacture of bricks or tiles, more or less sand or gravel is intermingled, the inner surfaces of the sides of the mold, would soon become worn by friction of the followers, and consequently the bricks would be increased in size and otherwise injured in proportion and appearance. One of our improvements is intended to remedy the above defects, by forming the sides of the mold of plates of chilled cast-iron or other suitable material, and which may be taken apart and ground as occasion requires, and adjusted together in such manner as to form a mold of the same capacity as originally made.

The working parts of our machinery are mounted and arranged on a suitable iron or wooden frame A, as seen in Figs. 1, 2, and 3.

a, a, Figs. 1, 2, 3, is a gallows frame or pair of iron bars, disposed on each side of the main frame, near its rear end; each pair meeting at top as seen in Fig. 1, so as to form bearings b, b, Fig. 3, for a cross shaft c. A pair of bars d', d', depend from the cross shaft c at the top of the upright bars a, a, and meet in a knuckle joint d, in the extremity of a toggle piece e, see Fig. 1; the said toggle piece e finishing in a second joint f, and having the crooked lever B (by which the machine is operated), projecting from it as seen in Fig. 2.

In rear of the joint f, and making a part of it, a pair of bars g, g, Figs. 1, 2, diverge to the back and inside of the main frame, and are connected to a cross shaft h, each end of which moves in a bearing or eye i, on the end of each of the main stay bolts k. A counterweight m is applied to the end of an arm or tail piece l, projecting from the shaft h, the object of the same being to assist in elevating the lever B.

In front of the second joint f, a driver bar n is jointed, or connected by means of a circular ring or link o, or in any other convenient and proper manner; the other end of the said bar being connected to the rear of the follower r, the latter resting and being secured on the sliding carriage board q. In front of this two bolts s, s, Figs. 2, 4, come upward on each side through the main frame A, and flanches or ends of the bed piece t of the mold; screws being cut on the tops of said bolts, upon which nuts are screwed for the purpose of confining the said bed plate of the mold to the main frame. Between each pair of bolts s, s, a bolt v, Figs. 1, 2, 4, is passed upward through the end or flanch of the bed plate t, until its head abuts against the underside of the mold. The other or top ends of the bolts v, v, are inserted through the ends of the top plate x of the mold, see Figs. 1, 2, 4, and have screws and nuts on them, by which the plate x is confined down upon the end pieces or plates w, w, of the mold. Each of the bolts v, v, has an eye nearly in the middle thereof, through which the side set screws u, u, are tapped to regulate the position of the end pieces w, w, of the mold.

The back follower y, Figs. 1, 2, 5, 6, 7, 8, situated in front of the mold, is mounted

on the vertical part of a kneed bar z , the horizontal part of said kneed bar, resting on the sliding carriage board q , and being secured thereto by a screw or bolt a' passing through a slot in the same. By means of the bolt and slot, the back follower may be so adjusted as to be carried into the mold, by the return of the carriage board q , when the lever B is raised, and also to be forced out of the same by the front follower, when the unpressed brick is entered, and the lever depressed until the back follower stops against the press block C.

The press block C is secured on the ends of the bolts k , k , by the screws and nuts a^2 , a^2 , and its vertical position is maintained by bed screw bolts a^3 a^3 , Figs. 1, 2, 3, going downward into suitable nuts and mortises in the main frame.

The detached Figs. 7 and 8 represent the back follower made in two parts or plates y , z , between which a piece of bagging, a^4 , soft leather, or other suitable material, is to be inserted previous to the plates being confined together. This bagging being saturated with oil or other proper unctuous matter, will lubricate the interior surfaces of the mold, as the follower drives out the compressed brick. This not only lessens the wear and friction of the parts, but prevents the sulphuric or other mineral acids in the coal which is mixed with the clay from destroying the metal of the mold, experience having proved, that without this application of the lubricator, a serious injury will result from both the above causes.

Another method of constructing the mold is represented in Figs. 9 and 10, 11, 12, the former being a top view of it, as detached from the frame, the next a front elevation, the third a side elevation, and the latter, a longitudinal section.

It will be perceived by inspection of these figures, that the mold is constructed with a rectangular outer frame or box a , of cast iron, the ends of which continue downward some distance below the bottom, forming projections b , b , by which the mold is secured to the main frame of the machine by screw bolts. The interior of the mold is composed of four plates of hard metal d , d , e , e , the top and bottom d , d , of which are adapted to each of the end plates e , e , at their joinings, by being inserted in right angular shoulders c , c , c , c , cut in the end plates as represented in Figs. 10, 12. These plates, on being inserted in the outer frame, are held or pressed together by screws f , f , f , f , f , f , passing or screwed through the plates. The shelf upon which the brick is deposited previous to being conveyed into the mold, is represented, at g , as projecting from the side of the frame, and having its top surface even or level with that of the lower plate of the mold, and when the brick

is placed thereon, it is pushed laterally against a lip or guide h , which is attached to the shelf and side of the frame, and has its inner edge perpendicular to the shelf, or in the same plane with the inner surface of one of the end plates of the mold. Therefore, when the follower advances upon the brick, it presses forward the same into the mold without any obstructions. The bottom plate of the mold rests on thin pieces or blocks of metal i , i , Figs. 1, 2, placed on the upper surface of the bottom of the frame. As the lower plate is reduced in its thickness by grinding, other blocks of greater thickness should be substituted or placed under the same, so as to bring the upper surface of the lower plate of the mold in the same plane as the top of the shelf.

From the above it will be seen that when the end plates become worn, their distances apart may be diminished by filing out or deepening their shoulders, or by grinding off the ends of the top and bottom plates, when it becomes necessary to bring the end plates closer together. By refacing or grinding down the surfaces of the upper and lower plates, their correct distances apart may also be preserved. When thus made and adjusted the machine is to be used as follows: The workman places the unpressed brick or tile between the front follower and the mold, or upon a suitable shelf C' , Figs. 1, 2, attached to and projecting from the bottom t of the mold, and depresses the lever B. This operation forces the unpressed brick into the mold against the back follower y , which latter recedes through the mold until it abuts against the press block C. The front follower still advancing completes the pressure on the brick, and on being raised draws back the press follower r , until the outer end of the slot of the bar Z takes, or comes in contact with, the bolt a' on the carriage board q . The motion continuing, the back follower now pushes the compressed brick entirely from the mold, so that it can be removed therefrom and another substituted.

The general arrangement of the pressing part of this machine is similar to that of many others, but as the operation of the parts which constitute our improvement, will be better understood by the description of the same above given, we have deemed it proper to enter into the above explanation.

The top, bottom, and ends of the mold, represented in Fig. 4, being all constructed of separate pieces of "chilled cast-iron or hardened steel or other suitable material," when worn, can be taken apart, and ground and polished so as to have the faces inside the mold kept true and smooth. This arrangement affords the means of contracting the length of the mold by moving its ends

toward each other, and of diminishing the breadth of the same, by grinding down the parts of the ends, in contact with the inner surfaces of the top and bottom. Therefore by the above, the mold may be adjusted to the size of the followers, whenever the latter are reduced by wear. This accurate adjustment of the parts prevents the edges and faces of the bricks from being injured by the escape of any portion of the material from between the edges of the followers and sides of the molds, as an opening of the thickness of common letter paper, would probably prevent the production of a well finished article.

Figs. 13, 14, 15, 16, 17 represent a machine constructed in some of its features substantially as above described, but in other respects it is somewhat different. The main peculiarity in this machine, by which it differs from that beforementioned, consists in the arrangement and construction of those parts, through which the power is applied which produces the impression. Fig. 13, is a top view of the machine. Fig. 14 is a right handed side elevation. Fig. 15 is a longitudinal and vertical section taken centrally through the apparatus. Fig. 16 is an elevation of the working end, or that at which the brick maker stands when operating the machine. Fig. 17 is an elevation of the opposite end. Throughout said figures from 13 to 17, inclusive, A represents the main framework on which the operative parts are supported.

B, Figs. 13, 14, 15, 16, is the mold frame, C, Figs. 13, 14, 15, is the pressing follower or platen, and D is the back follower.

The lever E to which the operative applies his hand to drive the front follower forward is represented in Figs. 14, 16, 17, as horizontal, while in Figs. 13 and 15, it is shown in its upward or inclined position, or in that which it has when the brick is placed on the shelf of the mold, previous to its being impressed. The power, to throw the platen or front follower C forward, is applied to the same through the intervention of the combined eccentrics F, G; to the former of which the lever is applied by the screw bolts A', A', Figs. 13, 14, 15. The eccentric F is jointed to the follower C as seen at b, Figs. 14, 15, while the other eccentric G is attached to the center of a strong horizontal shaft H, whose journals rest and move in suitable boxes or bearings I, I, applied to the front sides of two of the ports of the main frame as seen in Figs. 13, 14. The two edges of the eccentrics, which are in opposition with each other, are composed in both, of two straight surfaces *e*, *f* and *g*, *h*, Figs. 15, and two curved surfaces, *c d* and *i k*. At or near the point of junction of each these curved and straight surfaces, a small curved projection *s* on each ec-

centric enters into a corresponding or suitable notch *t* forward in the opposite eccentric, as seen in Fig. 15. When the lever E is raised into its highest position, the two straight surfaces *e f*, *g h* of each eccentric, are in contact with each other, as seen in Fig. 15, but when this lever is depressed, or brought downward toward a horizontal line, the two curved edges *c d*, *i k*, of the eccentrics are rolled upon each other. Each of the eccentrics has a segment *u*, *u*, (Fig. 14), of cogs or teeth, which engage with each other and enable the eccentric G to be raised or depressed by its opposite F. The arms *l*, *m*, *n*, connect the periphery of the eccentric G to the shaft H, while those of the other eccentric, viz, *p*, *q*, *r*, converge from the periphery and unite together near that portion of the eccentric which is joined to the follower C, the whole being arranged as represented in Fig. 15. Now, when the arms *m*, *q*, of the eccentrics, are raised so as to be brought into a straight line with each other, the follower C has advanced forward a sufficient distance to introduce the brick fairly into the mold, and in such manner that it rests against the face of the other follower, which in the meantime has also been moved back until it abuts against the bed piece, as was before described in the first description of the first machine.

Now as the two curved surfaces *c d*, *i k*, of the eccentrics come in contact, the impression commences and continues as they roll over each other and by means of these eccentrics the requisite degree of pressure will be insured to the brick. Were we to use straight toggles, this advantage could not be gained, for when bricks are molded, according as the clay is more or less tenacious, or contains more or less moisture, so when they are introduced into the pressing machine will they contain more or less earthy or argillaceous matter, and the surfaces will be more or less covered with "water galls" and their edges more or less imperfect and therefore it is easily apparent that according to the quantity of the same, in order to give a proper degree of pressure on every brick (although they may slightly vary in thickness before and after being pressed), it is necessary that the eccentrics used should be constructed so as to admit the follower in all cases to be advanced a sufficient distance forward, to so contract the brick, as not only to entirely remove the imperfections above named, but to densely compress together the particles composing the same. This desideratum every brickmaker is aware is highly necessary. The distance from the point *k*, of the eccentric F, from the center of motion *b* should be greater than that of the point *i* from the same, so as to make an eccentric curve of the line *k i* as seen in the drawing. The line *c d* of the eccentric G, should be a

similar curve, the distance of its point *c* from the center of motion or axis of the shaft H being greater than that of the point *d*. Thus it will be seen that by means of the 5 eccentrics, the machine is at once adapted to give the requisite degree of pressure to bricks of different thickness or which are more or less imperfect as above set forth. If one brick happens to be thicker than the 10 standard to which the machine is gaged on depressing the lever E, the eccentrics will not rise so high as before, and the impression will commence sooner; and thus the machine is adapted to press bricks varying 15 in their thickness.

After the brick is impressed the sliding carriage board I, Figs. 13, 15, 16, 17, is pressed back a short distance, (or until the two arms *g* and *l* of the eccentrics are 20 brought into a straight line with each other), by a cam or wiper K, Fig. 15, acting against a perpendicular stud L attached to the carriage board. The cam K is attached to, and projects from, the shaft H, as seen in 25 the drawings, so that when the eccentric G is detached, thereby turning the shaft in its bearings, the cam K rises, and its surface in contact with the inner side of the stud L, presses back the stud, until another cam or 30 curved arm M (projecting downward from the lower side of the shaft H or eccentric G as seen in Fig. 15), comes in contact with another stud N, attached to the carriage board, and which in its turn, causes the carriage board to recede as far back as neces- 35 sary.

The wiper K should be so curved, on its edge which operates against the face of the stud L, as to give to the sliding carriage 40 board such a retrograde movement as will keep the curved surfaces of the eccentrics in their true positions with respect to each other during their descent after an impression has been given by them; or until the 45 arms *g* and *m* are brought into a horizontal line with each other. The other wiper M should then commence its pressure against the stud N and the curve of the surface of the said wiper, acting against the stud, 50 should be such as will give to the carriage board such a back movement as will keep the projections *s* in contact with the notches *t* during the further descent of the eccentrics.

55 The practical construction of these wipers will be easily understood by builders of brick machines. The eccentrics may be inverted or turned bottom up, and the lever may be attached to the forward instead of 60 the back one, by which means a shorter lever

will answer the purpose and the operator may stand on the side of the machine if desirable. The mold may be placed horizontally instead of vertically as above set forth with the eccentrics either above or below 65 the same, thus forcing the brick downward or upward into the mold; but as these are only changes of form of the same invention we merely mention them to show the different modes in which we have contemplated 70 the application of our improvements.

In the above we shall claim—

1. Constructing the mold (independent of the followers), of separate pieces or plates 75 of chilled cast iron, hardened steel or other suitable material, fitted to each other by shoulders, as described, and arranged in a frame, and secured together by screws, passing through the sides of the frame, the same being represented in Figs. 9, 10, 11, 12, or 80 arranged and confined together by screw bolts as exhibited in Figs. 1, 2, 3, 4, and as hereinbefore explained, the whole being for the purpose of contracting the mold in its length or width and thus obviating at any 85 time, whenever necessary and in manner above set forth, the difficulties resulting from the wear of the inner surface of the mold.

2. We also claim interposing a piece of 90 cloth, felting or other suitable material of like character, between the plates composing the back follower, in manner above described; the cloth being, from time to time, saturated with any unctuous or fatty mat- 95 ter, the whole being for the purpose of lubricating the interior of the mold as before set forth.

3. We also claim the machinery for producing the impression, and removing the 100 brick from the mold, the same consisting of the eccentrics with their cams or wipers as exhibited in Figs. 14 and 15, and constructed arranged and operating together substantially in the manner as herein above ex- 105 plained.

In testimony that the foregoing is a true description of our said invention, we have hereto subscribed our names.

JOSEPH B. WILSON.

ALFRED B. CROSSMAN.

Witnesses to Joseph B. Wilson's signature:

R. H. EDDY,

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Witnesses to Alfred B. Crossman's signature:

GEORGE S. PARTRIDGE,

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