2 Sheets—Sheet 1.

J. B. TARR.

MACHINE FOR PRESSING MOLTEN METAL INTO INGOTS.

No. 185,197. Patented Dec. 12, 1876.

Fig 1.

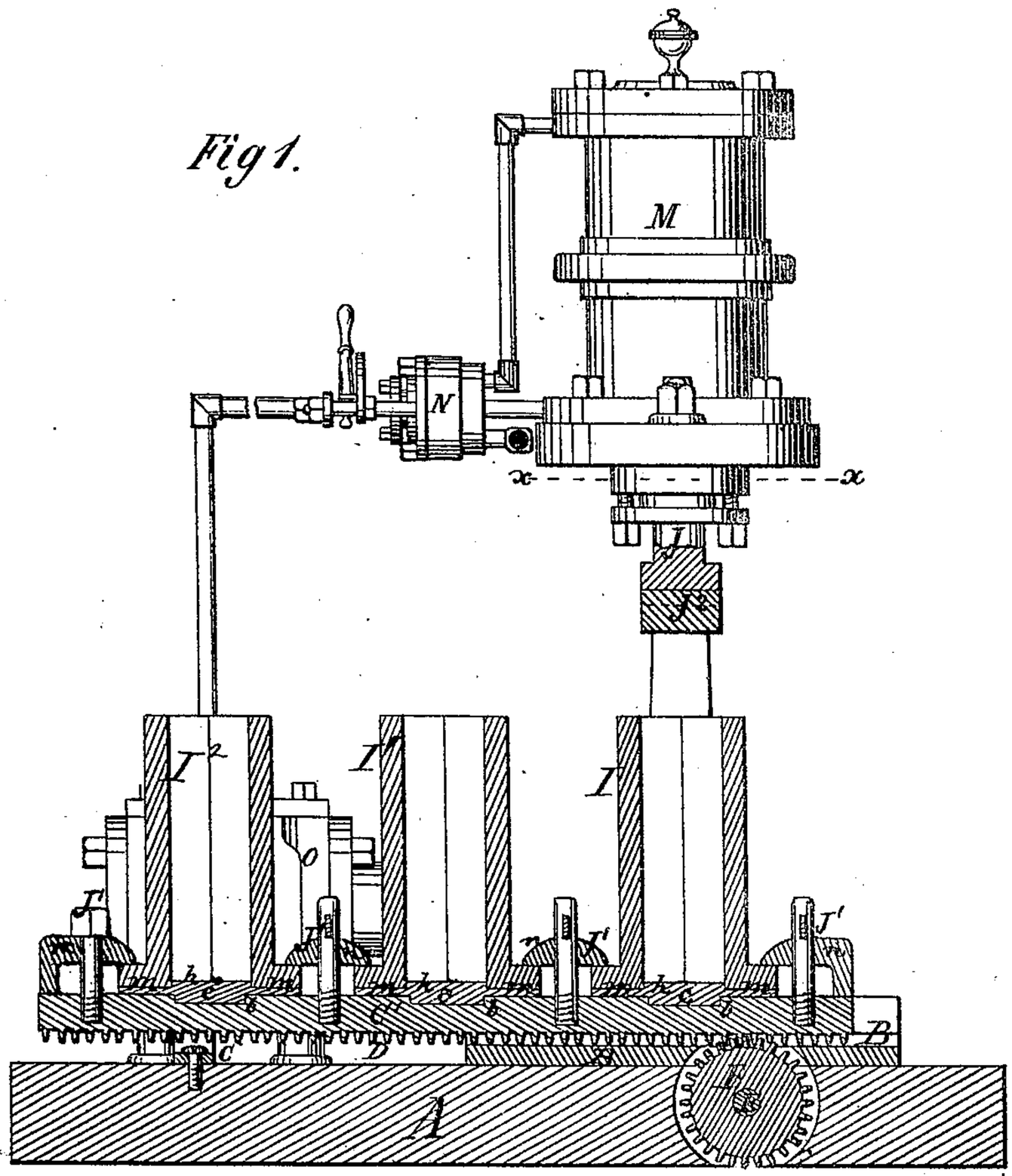


Fig 5.

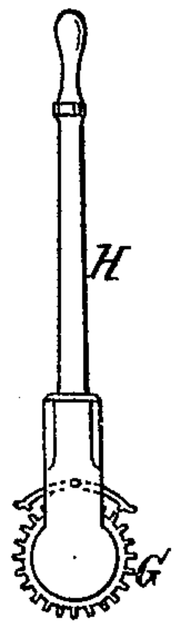
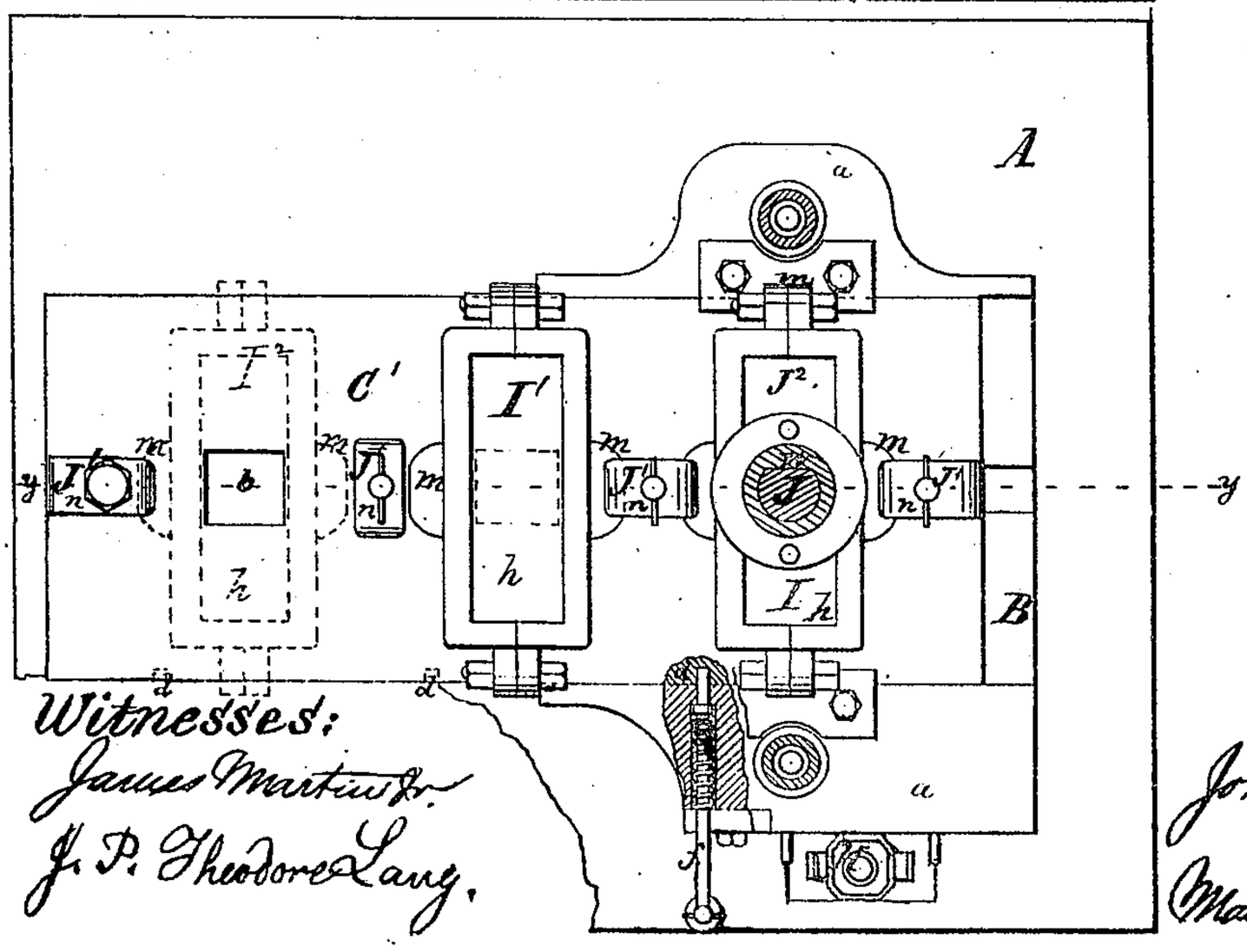


Fig 2.



Witnesses:
James Martin Jr.
J. P. Theodore Lang.

Inventor:
John Blake Tarr,
by
Mason, Fenwick & Lawrence

2 Sheets—Sheet 2.

J. B. TARR.

MACHINE FOR PRESSING MOLTEN METAL INTO INGOTS.

No. 185,197. Patented Dec. 12, 1876.

Fig 3.

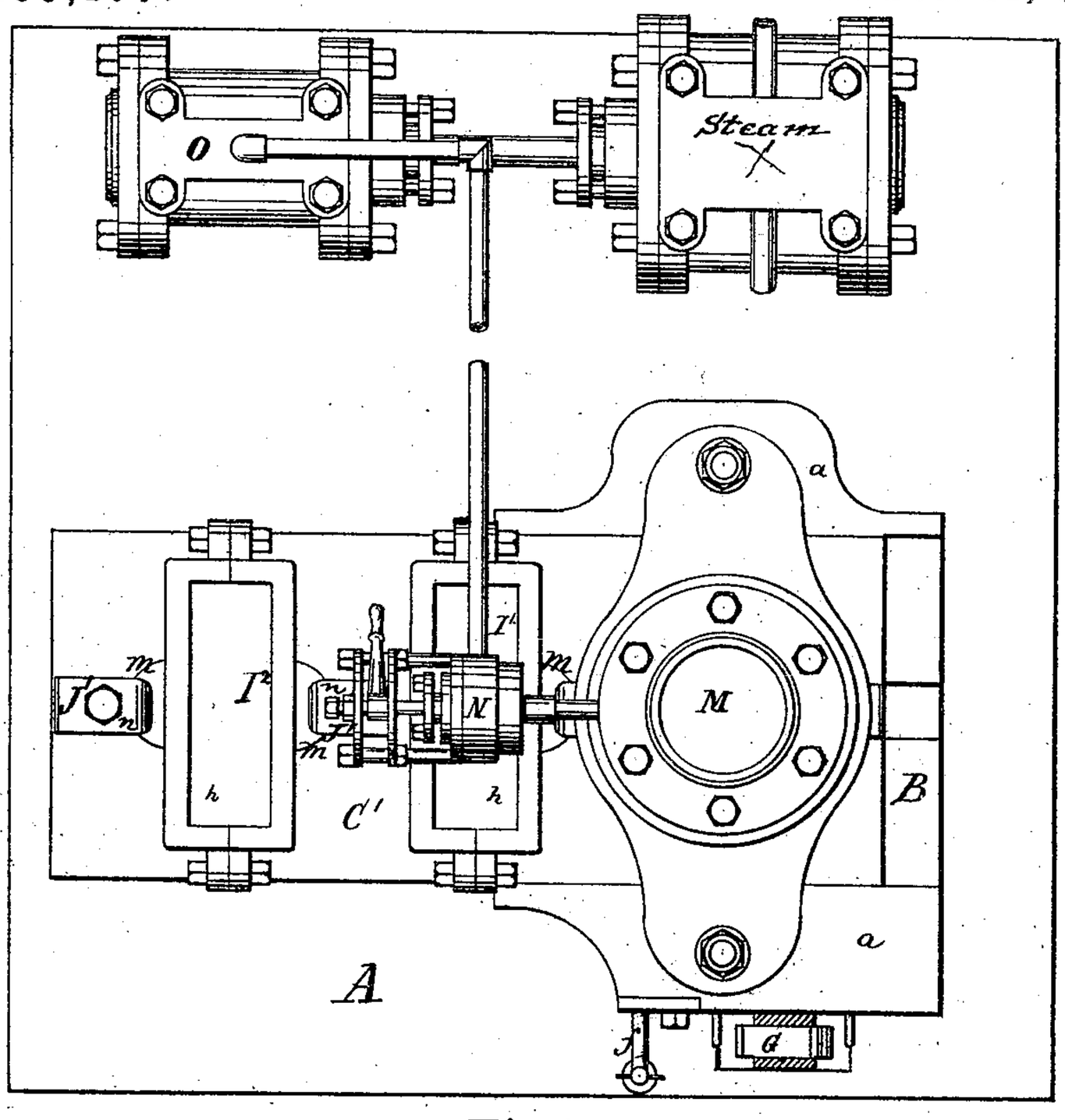
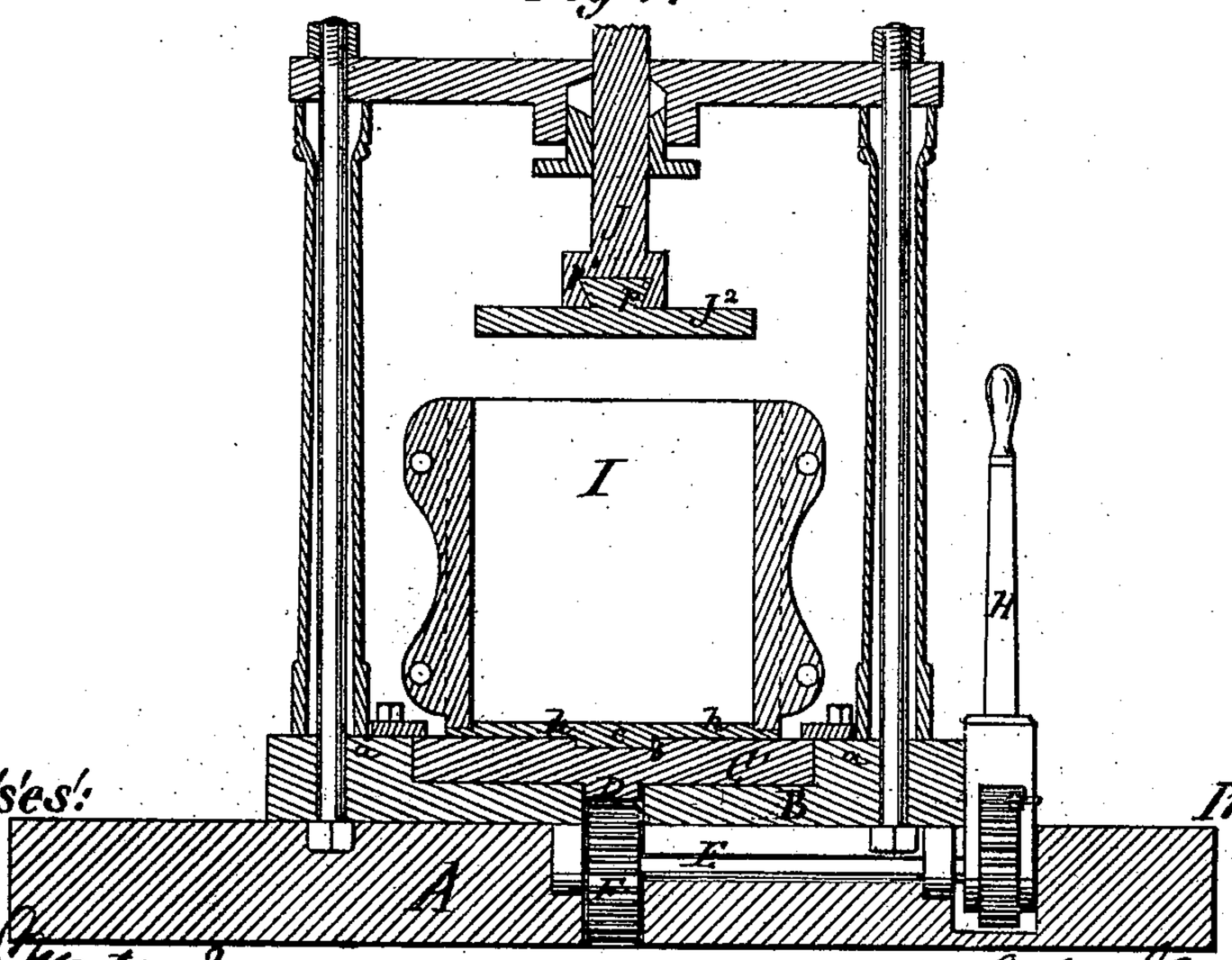


Fig 4.



Witnesses:

James Martin Jr.

J. F. Theodore Lang

Inventor:

John Blake Tarr

by Mason, Fenwick, Lawrence.

UNITED STATES PATENT OFFICE.

JOHN BLAKE TARR, OF FAIR HAVEN, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR PRESSING MOLTEN METAL INTO INGOTS.

Specification forming part of Letters Patent No. **185,197**, dated December 12, 1876; application filed May 24, 1876.

To all whom it may concern:

Be it known that I, JOHN BLAKE TARR, of Fair Haven, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Machines for Pressing Molten Metal into Ingots and other Forms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of the machine; Fig. 2, a horizontal section of the same in the line *x x* of Fig. 3. Fig. 3 is a plan view of the whole machine. Fig. 4 is a vertical cross-section of the same in the line *y y* of Fig. 2. Fig. 5 is a detail view of the reversing pawl-and-ratchet feed-movement.

My invention relates to machinery for producing pressed cast-metal ingots and castings of different kinds and forms for use in the arts, in the forms given to them by the molds; and the nature of my invention consists in certain constructions, arrangements, and combinations of parts, hereinafter described and specifically claimed.

To enable others skilled in the art to understand my invention, I will proceed to describe it.

In the accompanying drawings, A represents the flooring of a building; B, a short metal platform with side guides or flanges *a a*. This platform is firmly fastened in position in any convenient manner. C is a forked pillar block or support, firmly fastened in position, and provided with friction-rollers. This support, in connection with the platform B, steadies and holds a mold-bed, C′, in a true horizontal position, and prevents it from vibrating or swaying laterally to the right or left. The mold-bed C′ is provided with a toothed rack, D, on its under side, said rack occupying a central position on the mold-bed. E is a pinion and ratchet-wheel shaft placed transversely in supports beneath the bed. The pinion F of this shaft takes into the teeth of the rack, and moves it back and forth, and the ratchet G serves as a means by which to turn the shaft and pinion. This ratchet is provided with a double-acting pawl, pivoted centrally above it to a hand-lever, H, so as to be capable of rocking. By throwing up one end of this pawl the other will take into the teeth of the ratchet in rear of the shaft, and thereby become adjusted for feeding the mold-bed in one direction, and by throwing up the opposite end of the pawl its other end will take into the ratchet in front of the shaft, and the machine thereby become adjusted for feeding the mold-bed in a reverse direction.

The adjustment of the pawl is made with the hand or by a rod, and the movement of the shaft is effected by vibrating the hand-lever H.

In the top of the mold-bed, at uniform distances apart, rectangular cavities *b* are formed, and in each of these cavities a rectangular projection, *c*, formed on the bottom of each of the molds I I^1 I^2, fits snugly; and in proper relation to these cavities, and to the pressing-piston J of the power-press gage, stop-holes *d* are provided, and on one side of the bed a spring stop-pin, *f*, is arranged. This stop-pin enters the respective gage-stop holes *d* at the moment one on the molds is fed centrally under the pressing-piston, and locks the mold-bed during the descending operation of the piston. The stop-pin is moved out of the holes by hand, and into the same by the spring *f*.

The molds represented are made in two vertically-divided halves, and with removable or false bottoms, and on the top of each of these bottoms a projection, *h*, corresponding in size to the interior of the mold, is formed, and over this projection the body of the mold fits snugly.

The molds might be made in one piece, with their bottoms immovable; but I prefer the plan shown.

At the base of each mold, on two sides, lugs *m m* are formed, and corresponding lugs may be formed on the false or removable bottoms.

J′ J′ are vertical screw or key bolts, secured to the mold-bed in close proximity to the lugs *m m*. On these bolts clamps *n n* are placed loosely, so as to turn on the bolts.

By means of the lugs, clamps, and bolts the molds can be securely fastened upon the bed, and the joint between the bottoms and the body of the mold made tight when detachable bottoms are used. The turning up of the

bolts or the withdrawal of the keys loosens the clamps, and the molds can be readily removed from the bed.

The piston-head is made of two parts, J and J^2, and the parts are united to one another by a tapering dovetail tongue, *p*, on one part, and a corresponding dovetail groove, *p'*, on the other, or by a T-head connection, which permits the part J^2 to be moved laterally out of connection with the part J. By this construction of the pressing-piston the form shown may be substituted by any other desired form, according to the form of the mold used, and the union and separation of the parts J and J^2 may be effected without the trouble of withdrawing and inserting keys or pins, and without moving the part J^2 downward. The piston-rod is made of round iron, as this metal costs less to produce it, and is used with greater economy in the manufacture of the power-machine, as the cylinder-heads and stuffing-boxes can all be bored out. While, therefore, I use a round piston-rod, I make one side, *w*, of it flat by planing off a portion of its surface; and I also plane out the bore of the stuffing-box and head of the cylinder to a form which will match the piston-rod. By this construction I provide a perfect guide for the piston, and am enabled to use molds with many sides, and have the piston enter them with unerring accuracy. The piston-rod extends up into an hydraulic cylinder, M, mounted on a suitable frame. The cylinder is furnished with a suitable cut-off valve, N, which is connected with a pump, O, of any suitable known construction, and worked by a steam-engine, as illustrated in the drawings, or in any other proper manner.

Operation: The first of the series of molds is sufficiently filled with metal to form an ingot or casting, and moved (by working the ratchet-lever) toward and under the pressing-piston until the spring locking-pin falls into the first stop-hole. The cut-off valve N is then opened and a powerful hydraulic pressure allowed to act on the top of the piston of the cylinder M until the pressing-piston has descended far enough in the mold to shape and condense molten metal into an ingot or casting, as the case may be. The hydraulic pressure is now cut off and the piston raised by the admission of hydraulic pressure below it. During the pressing operation, or at its completion, the second mold of the series is filled, and as soon as the metal in the first mold is operated upon and the pressing-head withdrawn, the bed is unlocked and moved along, by working the ratchet-lever, until the second mold takes its place and becomes locked, when the pressing operation just described is repeated. The same operation takes place in bringing the third mold under the pressing-piston. To reverse the movement of the bed after the filled molds are removed and other empty molds placed upon it, the pawl is adjusted so as to take into the teeth of the ratchet on the opposite side of the ratchet-shaft. The number of molds above two or three may be indefinitely increased, as the necessity of the case may demand.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a metal molding and pressing machine, the reciprocating bed having a plurality of molds arranged upon it, in combination with a guiding and supporting platform, and a pressing-piston of a hydraulic cylinder placed above the bed, substantially as described.

2. The combination of a bed, a plurality of molds, a supporting-platform, a pinion, a ratchet, a double-acting pawl, stop-holes, a spring locking-pin, and a pressing-piston, substantially as described.

3. The combination of the short supporting-platform, long mold-bed, having a series of molds upon it, the separated support, and the single pressing-piston, substantially as described.

4. The bed with centering cavities, in combination with bottoms of molds, having corresponding projections for entering the cavities, substantially as described.

5. The molds with removable bottoms, having top and bottom projections *c* and *h*, for fitting, respectively, into the body of the mold and into the bed thereof, substantially as described.

6. The bed with screw or key bolts and clamps, in combination with lugs on the base of the body of the molds, substantially as described.

7. The piston-rod carrying a pressing-head, and the pressing-cylinder and its gland, made with flattened guiding-surfaces, in combination with a mold having many sides, substantially as described.

JOHN BLAKE TARR.

Witnesses:

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C. H. MOULTON.