

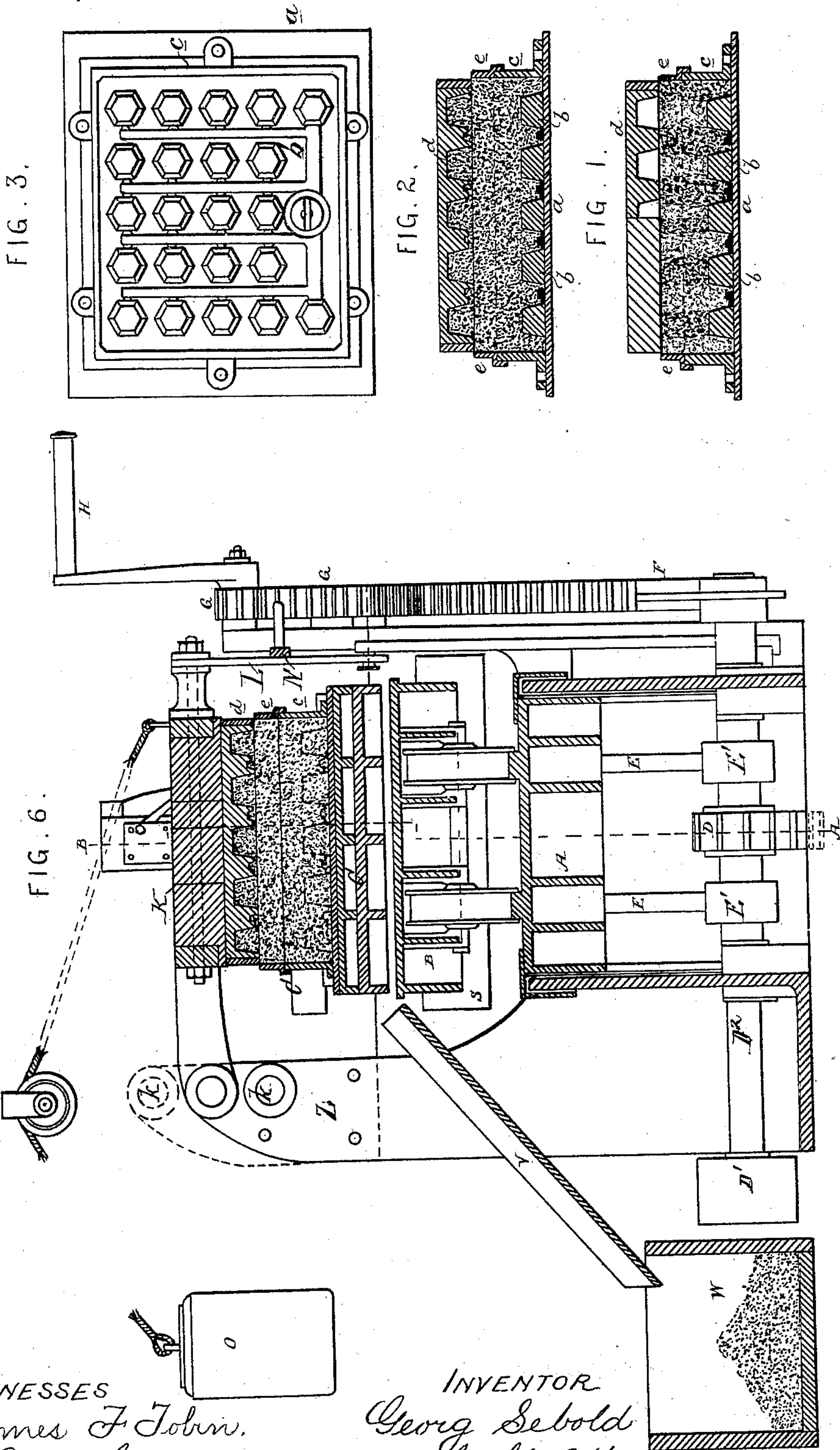
(No Model.)

4 Sheets—Sheet 1.

G. SEBOLD.
Molding Machine.

No. 233,032.

Patented Oct. 5, 1880.



WITNESSES
James F. John.
Henry Howson Jr.

INVENTOR
George Sebald
by his Attorneys
Howson and Son

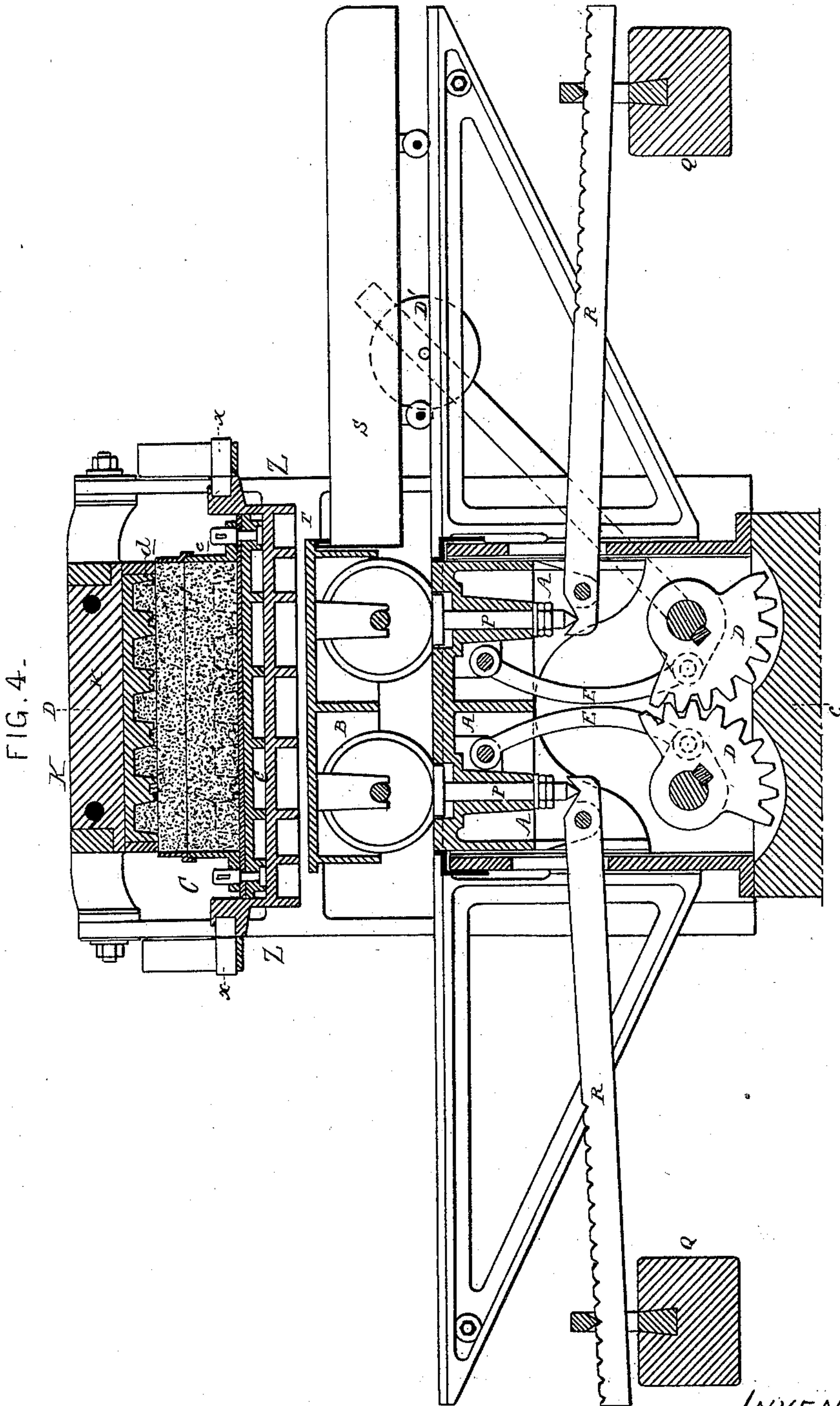
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by his Attorneys
Howson and Son

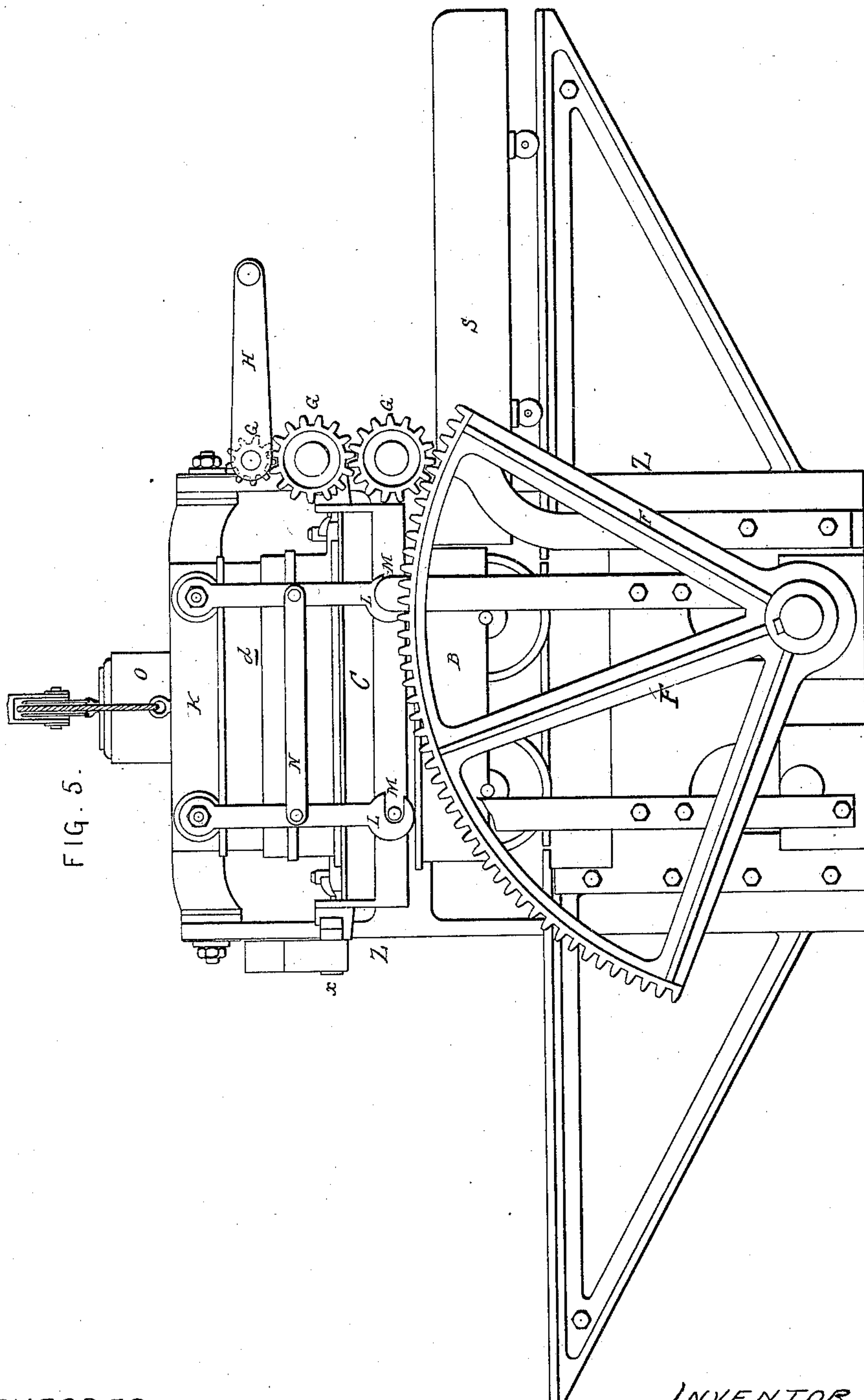
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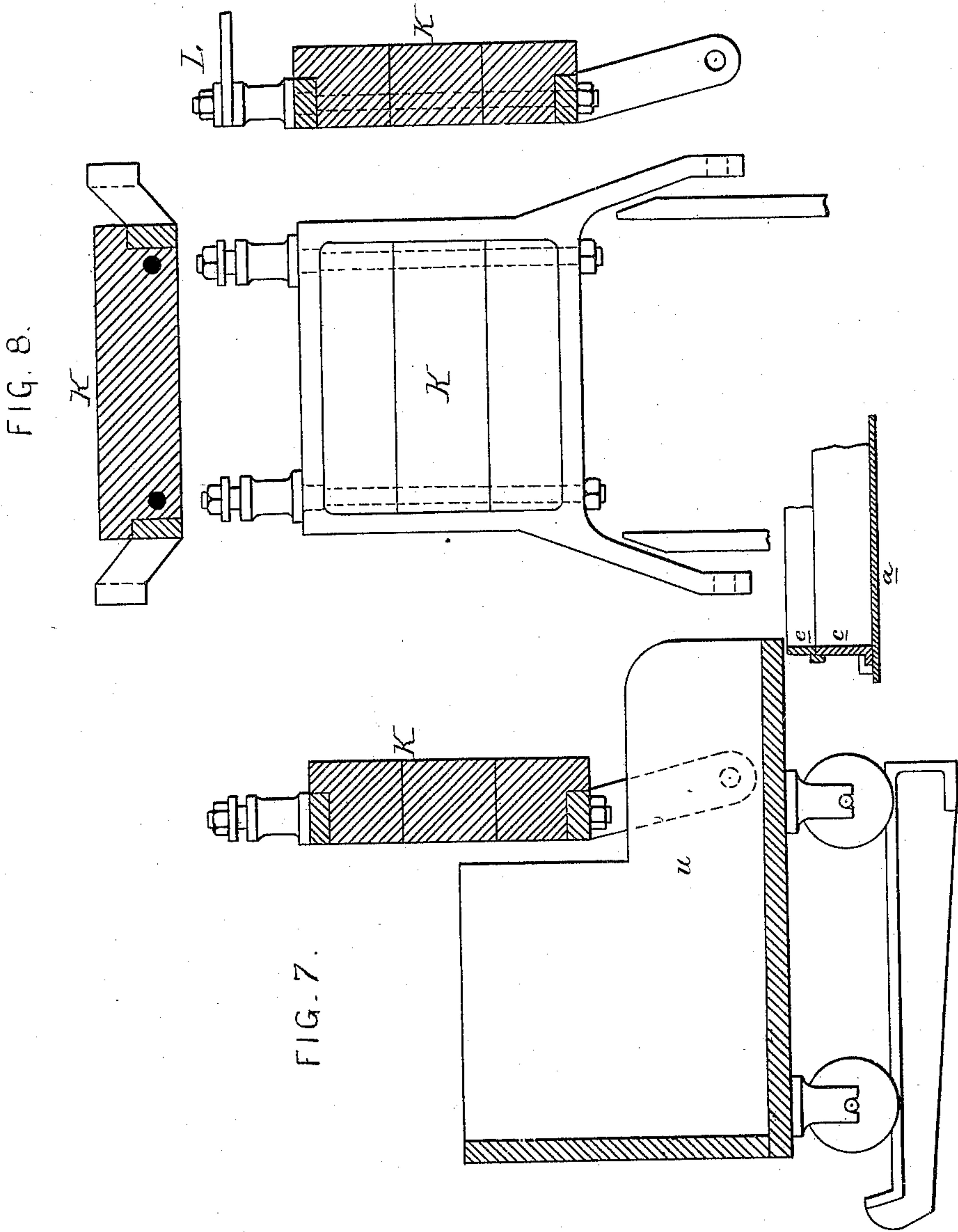
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UNITED STATES PATENT OFFICE.

GEORG SEBOLD, OF DURLACH, GERMANY.

MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 233,032, dated October 5, 1880.

Application filed August 16, 1880. (No model.) Patented in England August 11, 1879.

To all whom it may concern:

Be it known that I, GEORG SEBOLD, of Durlach, Germany, and a subject of the Emperor of Germany, have invented a new and useful Improvement in Molding-Machines, of which the following is a specification.

The object of my invention is to so construct a machine for preparing sand molds from patterns that the sand will be uniformly rammed in the mold-boxes when patterns of irregular configuration are used, and that the compression of the sand in the mold-box shall always be effected to the exact degree required irrespective of variations in the nature and conditions of the sand.

Molding-machines that have heretofore been employed for the purpose of dispensing more or less with skilled manual labor have only imperfectly fulfilled their object, from two causes—namely, first, because the pressure exerted by the machine on the sand in the mold-boxes was effected by means of a flat plate, so that with patterns of irregular configuration the sand was compressed more at the higher parts of the pattern than at the lower parts, such unequal compression producing injurious effects that are well known. To remedy this wood pressing-plates have been used, on the surface of which the configuration of the pattern was reproduced by carving, and, irrespective of the impossibility of producing an exact counterpart of the pattern by this means, this arrangement has the further defect that the sand is thereby compressed to a greater degree at the lower parts of the pattern than at the higher parts.

Figure 1 of the accompanying drawings, showing the two above-described modes of molding—namely, on the left-hand side by the use of a flat plate and on the right-hand side by the use of a carved plate—will show at a glance the truth of what has been stated above. Fig. 2 is a sectional view, illustrating my method of overcoming the objections referred to; Fig. 3, a plan view of the box and pattern; Fig. 4, Sheet 2, a vertical section of the molding-machine; Fig. 5, Sheet 3, a side view of the same; Fig. 6, Sheet 1, a transverse section; Figs. 7 and 8, Sheet 4, views of the traveling sand hopper and platen.

The second defect arises from the fact that

the operator does not know when the pressure upon the mold-sand has been effected to the requisite degree. If the sand were always equally moist and of the same degree of fineness, this might be remedied by making a mark on the filling-frame on the top of the mold, to which the pressing-plate should descend in compressing the sand; but as the moisture and fineness of the sand varies this is not possible, because with the same pressure the sand would be too tightly rammed if more moist than usual, and too slightly rammed if drier than usual.

Fig. 2 of the drawings shows the arrangement employed for obviating the first above-described defect.

On the base-plate *a*, having the pattern *b* fixed thereon, is placed the mold-box *c*, and into this is run heated gutta-percha or other substance that on cooling becomes sufficiently rigid to exert the requisite pressure during the subsequent ramming process. By this means a reversed counterpart of the pattern is obtained, which can be removed on cooling, and which now forms the pressing-plate *d*.

In molding the mold-box *c* is filled with sand, as usual, and leveled. The plate *d* is then inverted, so that its figured surface is uppermost, and the filling-frame *e* having been placed upon it, it is also filled with sand and leveled. The top of the filling-frame having been closed by a piece of sheet metal, the frame and pressing-plate are inverted and placed on the mold-box, as shown at Fig. 2, the sheet metal being then withdrawn.

It will now be seen that, as the sand in the uncompressed state is everywhere of uniform thickness over the pattern, its compression will also take place uniformly in all parts, resulting in the production of a perfectly homogeneous sand mold, such as could not even be produced by the most skilled operator in hand-ramming.

Fig. 3 shows a plan of the mold-box and pattern.

The second objection I overcome by means of the machine illustrated in Figs. 4 to 6. The table *A*, which can work up and down in suitable guides, supports the carriage *B*, carrying the mold-box *C*, the upward motion of the table causing the top of the mold-box to be

pressed with sufficient force against the platen K to effect the ramming of the sand mold. The action might, however, be reversed—that is, the table be made stationary and the platen be pressed down on the mold-box.

The upward motion of the table is effected by means of the segmental racks D on the shafts D², Figs. 4 and 6, these shafts being provided with cranks E', connected to the table A by links E. One of the shafts D² carries at one end a counter-weight, D', for the table and its load, and at the other end a toothed segment, F, geared through the wheels G with the crank-handle H, by which the parts are operated.

The platen K is hinged to the framing on one side, so that it can be turned back. When it is required to exert pressure it is held by clamping-pieces L, which are pivoted to the platen and hooked to pins on the framing at M, and are connected together by a link, N, so that a push is sufficient for throwing them out of connection for freeing the platen. The weight O, connected by means of a cord passing over pulleys to the front end of the platen, holds this in balance. The platen is adjustable in height, so that higher mold-boxes can be used. The framing Z is for this purpose extended upward and provided with bearings k, in which the pivots of the platen can be introduced. The clamps L can also be changed for this purpose.

The truck B does not rest directly upon the surface of the table, but on the ends of pins P, Fig. 4, that can slide in holes in the table, and whose lower ends are supported by the short arms of levers R, the long arms of which are loaded by adjustable weights Q, to exert with their short ends an upward pressure against the pins P corresponding to the maximum pressure to which the sand mold is to be subjected. Thus on the raising of the table A the levers R (the pivots of which are carried thereby) keep the truck and mold-box pressed up against the platen until the maximum desired compression of the sand mold has been attained, whereupon, if the upward motion of the table be continued, the mold-box and truck, in being pressed downward by the platen, will simply depress the pins against the action of the weighted levers, which will accordingly have their weighted ends raised, so that no additional pressure will be exerted on the sand mold. The degree of compression of the sand mold may be regulated by changing the position of the weights on the levers R. After completing the compression the table A is lowered, the platen K is raised, and the truck is removed from under the mold, which rests with trunnions x in the framing Z. This mold is then turned over, so that the pattern-

plate is uppermost, and this is removed after loosening it with a few taps with a hammer.

In order that no sand may fall on the table and guide-rails, a tray, S, is attached to the truck in such manner that in rising with the table the coupling-hook T thereof disengages itself from the tray and engages therewith again on the descent of the table.

In order that the mold may be conveniently filled with sand, a hopper, U, Fig. 7, running on wheels on the framing, is provided, containing sufficient sand for several filling operations, which hopper is pushed back when a mold-box is under the press. Every time a fresh mold-box has to be filled the hopper is pushed forward, the platen being turned up so that the hopper abuts close against the mold-box. The sand is then pushed into the latter by a rake, and on leveling the surplus sand falls through the chute V, Fig. 6, into the box W below.

Fig. 8 shows the platen in its various positions.

I claim as my invention—

1. The mode herein described of preparing sand molds for casting—that is, first, obtaining a reverse of the pattern; second, filling the face of this reverse and the pattern and mold-box with sand, and then placing the reverse pattern thus filled face downward on the sand in the box and subjecting the sand to pressure between the two patterns.

2. The combination and arrangement of the molding-box with the pattern and the reverse pattern molded therefrom, substantially as and for the purpose set forth.

3. In a molding-machine, the combination of the table A, links E E, and toothed segments D D with toothed segment F and operating-gear, substantially as described.

4. In a molding-machine, the combination of the elevating-table A, mold-box, and truck B with pins P P, supporting said truck, and with weighted levers R, adapted to act on said pins, as and for the purpose set forth.

5. The combination of the mold-box and pivoted platen of a molding-machine with a frame, Z, having bearings for the pivots of said platen at different heights, substantially as described.

6. The combination of the mold-box and truck B with the tray S.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORG SEBOLD.

Witnesses:

J. ENGLE,
MÜLLER.