

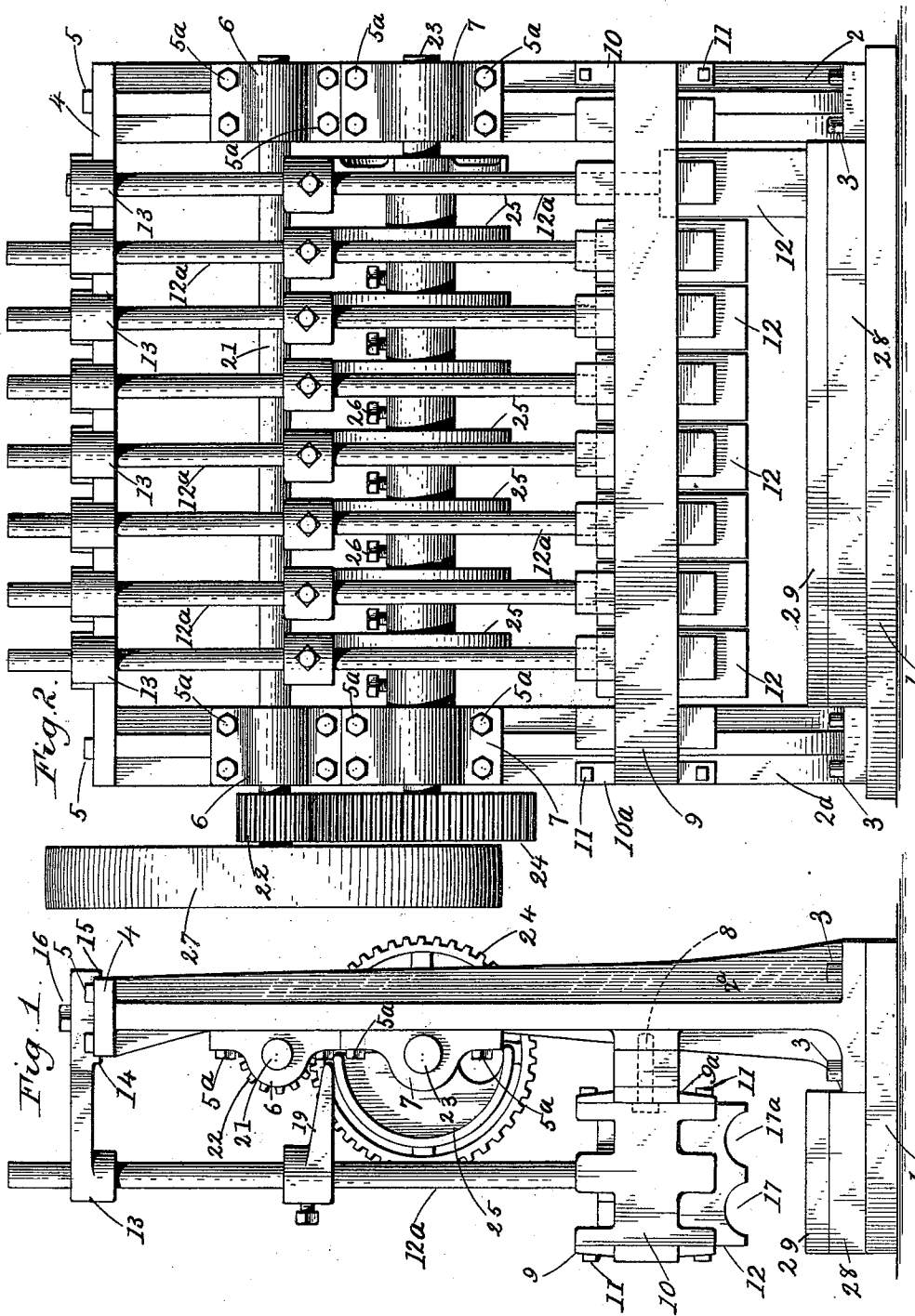
(No Model.)

2 Sheets—Sheet 1.

J. A. FIELD.
MOLDING MACHINE.

No. 560,404.

Patented May 19, 1896.



Witnesses
A. Langston
W. C. Davidson

Inventor.
Jesse A. Field
By James Langston atty.

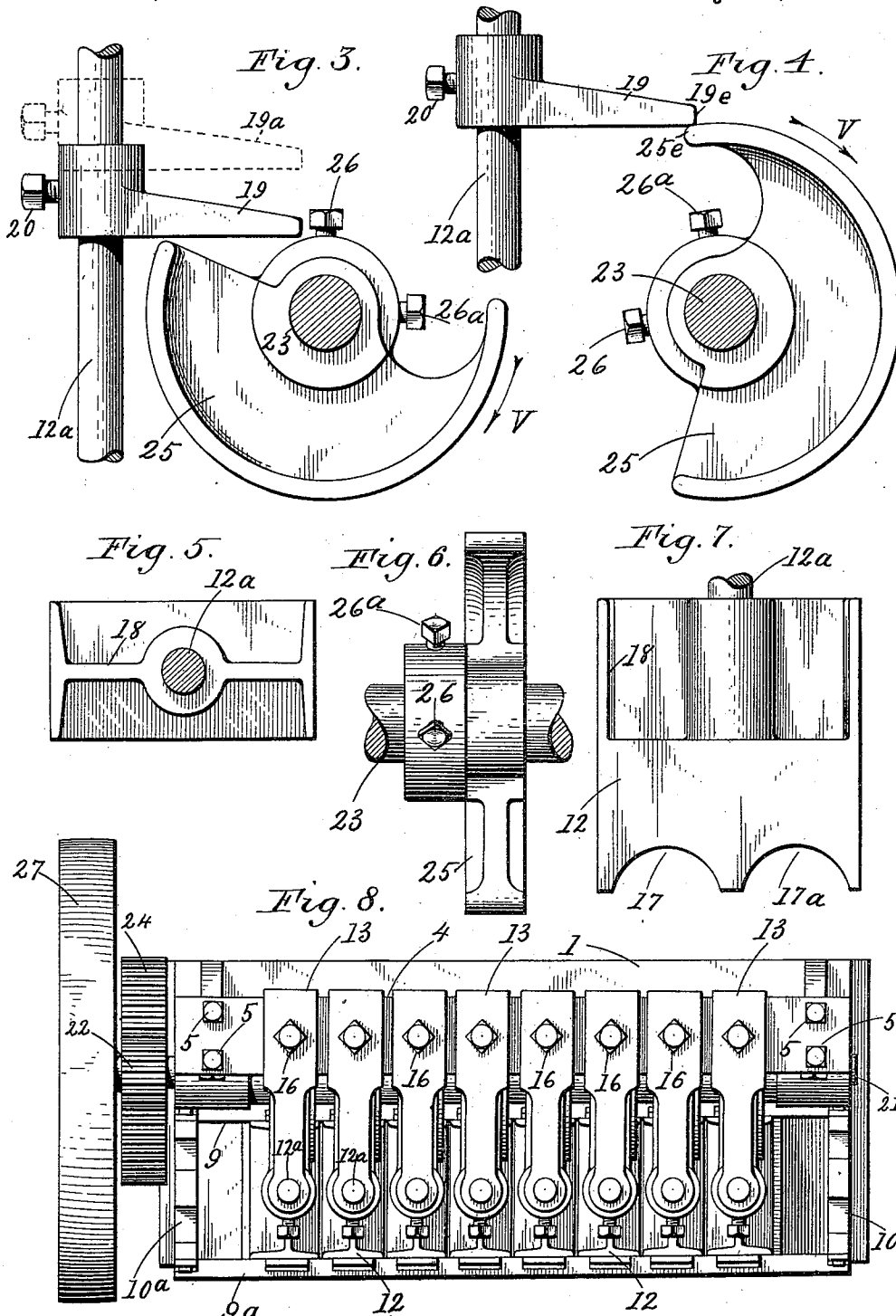
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UNITED STATES PATENT OFFICE.

JESSE A. FIELD, OF DUNKIRK, NEW YORK.

MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 560,404, dated May 19, 1896.

Application filed September 3, 1895. Serial No. 561,189. (No model.)

To all whom it may concern:

Be it known that I, JESSE A. FIELD, a citizen of the United States, residing at Dunkirk, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification.

The object of my invention is to provide an effectual and simple means for making sand molds from patterns for casting radiator-sections, stove-plates, or other castings, and it will be fully and clearly hereinafter described and claimed; reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of the machine, the driving-pulley being omitted. Fig. 2 is a front elevation of the machine complete, one of the ramming-hammers being in its lowest position. Fig. 3 represents a detached side elevation of one of the lifting-cams, showing it in position starting the hammer-shaft upward, the arrows V showing the direction of movement. Fig. 4 is a similar side elevation of one of the lifting-cams, showing one of the hammer-shafts at the limit of its upward movement and the cam nearly in position to allow it to drop. Fig. 5 is a detached top view of one of the ramming-hammers. Fig. 6 represents a detached front elevation of one of the lifting-cams. Fig. 7 represents a detached side elevation of one of the ramming-hammers. Fig. 8 represents a top plan view of the machine complete.

Referring in detail to the drawings, 1 represents the base of the machine; 2 and 2^a, the side frame-pieces. They are rigidly secured to the base 1 by bolts 3. At the top of the frame is a supporting-bar 4, extending from one side frame-piece to the other and rigidly secured thereto by bolts 5. At the front of each side frame-piece 2 and 2^a is secured by bolts 5^a two journal-boxes 6 and 7. Below the boxes 7 is rigidly secured by bolts 8, one of which is shown by the dotted lines 8 in Fig. 1, a rectangular ramming-hammer frame, consisting of the two longitudinal frame-pieces 9 and 9^a and the end pieces 10 and 10^a, securely bolted by bolts 11.

The ramming-hammers 12 move up or down within the above frame, and the hammer-bars 12^a are kept in line at their lower ends thereby, the upper ends of the hammer-bars

12 being kept in line by their supporting-brackets 13, a series of the brackets 13 corresponding in number with the hammer-bars 12. These brackets 13 are each provided with a transverse holding-strip 14 and 15, (see Fig. 1,) adapted to clasp over the sides of the supporting-bar 4 and fit the same closely. They are then rigidly secured to the bar 4 by bolts 16. The ramming-hammers 12 are on the under side, in a form adapted to the pattern over which they are designed to ram the sand. For a radiator-section pattern the form shown in Figs. 1 and 7 answers the purpose, in which two transverse semicircular recesses 17 17^a are used. The ribbed portions 18 at the top of the hammer (shown in Figs. 5 and 7) are for the purpose of preventing the hammer from either dropping down below or being raised up above the rectangular guiding-frame, so that the hammers will at all times be kept in alinement. On each hammer-bar 12^a is a cam-bar or bracket 19, adjustably secured to the bar 12^a by a set-screw 20, so as to be adjustable up or down on said bar, substantially as shown by the dotted lines 19^a in Fig. 3, the object being to regulate the force of the blow of the hammer on the sand in the flask, as will appear more clearly farther on.

In the boxes 6 is mounted the driving-shaft 21, carrying a spur-pinion 22, rigidly secured to it by a key or other well-known means. Below the shaft 21 is mounted another shaft 23 in the boxes 7, to which is rigidly secured a spur gear-wheel 24, adapted to gear in with the spur-pinion 22. On the shaft 23 is mounted a series of substantially semicircular cams 25, the number corresponding with the hammer-bars and their adjustable cam-bars 19. These cams 25 are made adjustable on the shaft by means of the set-screws 26 and 26^a, which can be loosened so that the cam or cams can be turned on the shaft and then rigidly secured by the set-screws 26 and 26^a. Their object is to provide the means whereby the hammers can be made to fall at different times—that is, so that they can be adjusted to all fall at one and the same time, or any one or number can be made to drop before the others. This adjustment is very important, and often has to be made to suit the pattern that is being molded from. The

adjustment by which the hammers are made to drop a greater or less distance or from different heights is also an important adjustment. By referring to Fig. 3 it will be seen how this is done. When the brackets or cam-bars 19 are in the position shown at 19, it will be seen that the hammers will be raised a greater height than they would be if adjusted farther up on the bars—in the position shown by the dotted lines 19^a, for instance.

The operation of the cams 25 is shown in Figs. 3 and 4. In Fig. 3 the cam is shown in position just coming in contact with the cam-bar 19, and as it moves in the direction of the arrow V it will raise the cam-bar 19, also the bars 12^a and their hammers 12, until the cam reaches the position shown in Fig. 4, when the hammers have reached the limit of their upward movement, and as the cams continue their movement in the direction of the arrows V and the point 25^e (see Fig. 4) passes the point 19^e the hammers will drop.

In Figs. 2 and 8, 27 represents the driving-pulley. This driving-pulley is omitted in Fig. 1. The flask 28 is shown in Figs. 1 and 2, is removable, and only placed in the position shown when the sand is required to be "rammed" over and around a pattern. These flasks are moved to and from the machine by hand. A supplementary removable frame-piece 29, adapted to fit and set on the top of the flask, is used while ramming the sand, so that the flask will be filled even with its top or a little over to allow the surplus sand to be scraped off in the usual way.

The operation of the machine is as follows: The bracket or cam-arms 19 are set so that each one of the ramming-hammers will give the required blow on the sand to answer for the pattern used, (some patterns requiring a heavier blow at some points than others.) This is done by regulating and securing the arms 19 at different points up or down on the vertical hammer-bars 12^a, so that the hammers will drop from different heights and their force will thereby be varied. The cams 25 should also be adjusted so that the several hammers will fall at different times, or so that all will be released at the same time, as the shape of the pattern may require. A pattern being placed on the table or base 1 or on a board placed thereon, the hammers 12 being in their upward position, a flask 28 is put under them in place, as shown in Figs. 1 and 2, the frame-piece 29 being placed on top of the flask and the whole filled with sand. The

machine is now started. The cams 25, turning in the direction of the arrow V, drop the hammers, as hereinbefore described. For many purposes a single drop of the hammers is sufficient to pack the sand to the required density around the pattern; but the operation may be continued until one, two, or more blows have been struck on the sand, because some patterns require more ramming than others. The machine is then stopped. The flask is removed and the sand scraped off or otherwise leveled. The pattern being removed from the mold it is in condition to be used in the well-known way.

I do not limit myself to the exact shape of the cam, as illustrated, for lifting the ramming-hammer, because the shape of the cam may be varied or changed considerably either by increasing or shortening the length of its peripheral or holding face, and thereby either increase or shorten the time for keeping the hammer up to the limit of its upward movement and still allow a sufficient time for the flask to be put in place to receive a charge of sand and then receive the action of the ramming-hammer. A simple arm rigidly secured to the shaft 23 and extending outward therefrom may be employed. This construction would not answer the purpose quite so well as the cam hereinbefore described, because the cam 25 tends to keep the ramming-hammer suspended at the limit of its upward movement for a longer time and thus give more time within which the flask and its removable frame may be put in place either under the upward-moving or suspended ramming-hammer; but still it could be made to answer the purpose and be effective and useful.

I claim as my invention—

The combination in a molding-machine, of a series of vertically-movable ramming-hammers located side by side and kept in alignment by a frame surrounding the series of hammers, a vertical hammer-bar extending up from each hammer, a supporting-frame for keeping it in line, a vertically-adjustable horizontal cam-bar on each hammer-bar for adjusting the distance it shall drop, a corresponding series of adjustable cams for lifting and dropping each hammer and for adjusting the time each shall drop, and means substantially as above described for operating them.

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Witnesses:

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