

No. 719,250.

PATENTED JAN. 27, 1903.

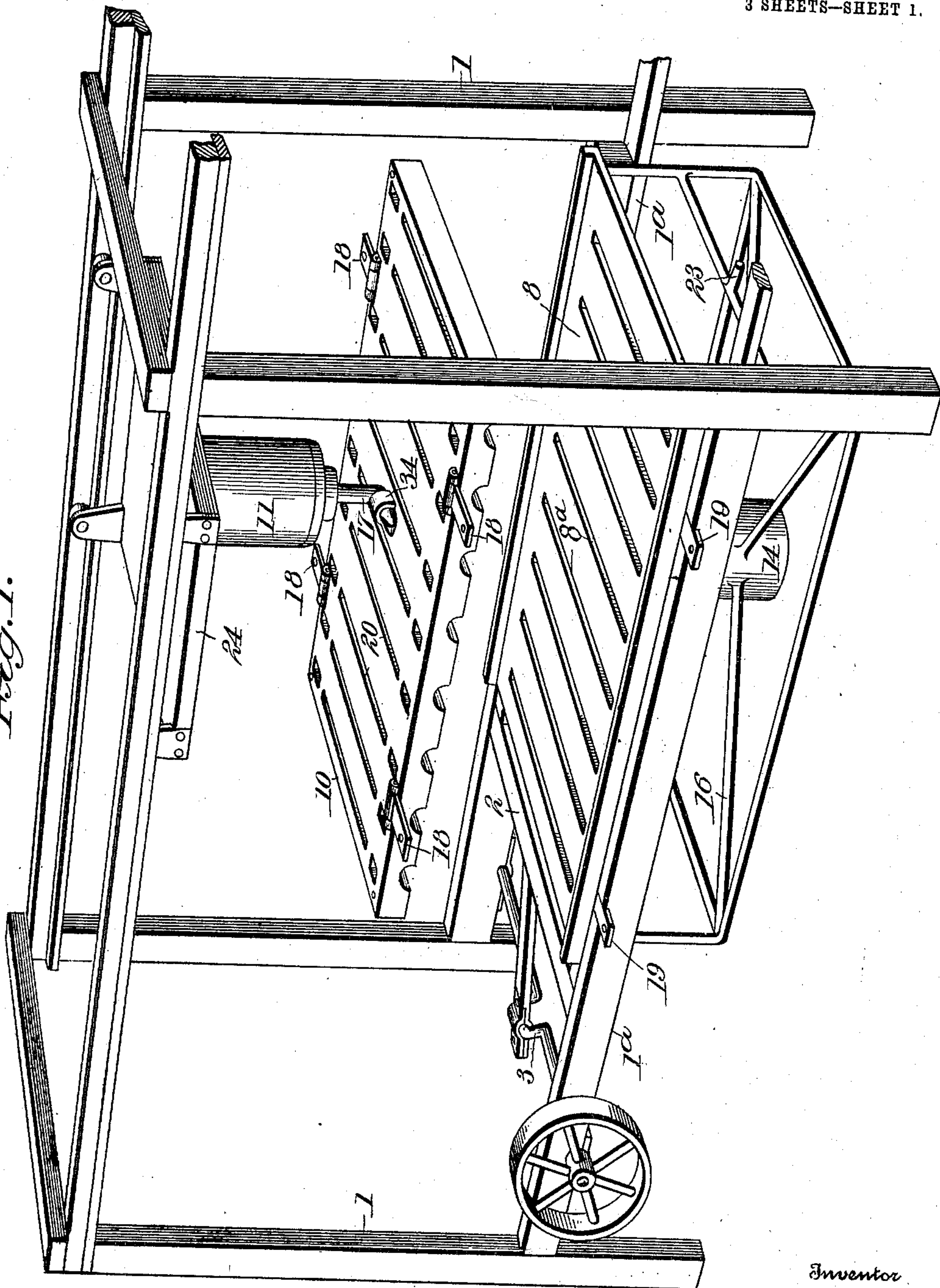
J. F. NOLAN.  
MOLDING MACHINE.

APPLICATION FILED MAY 2, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



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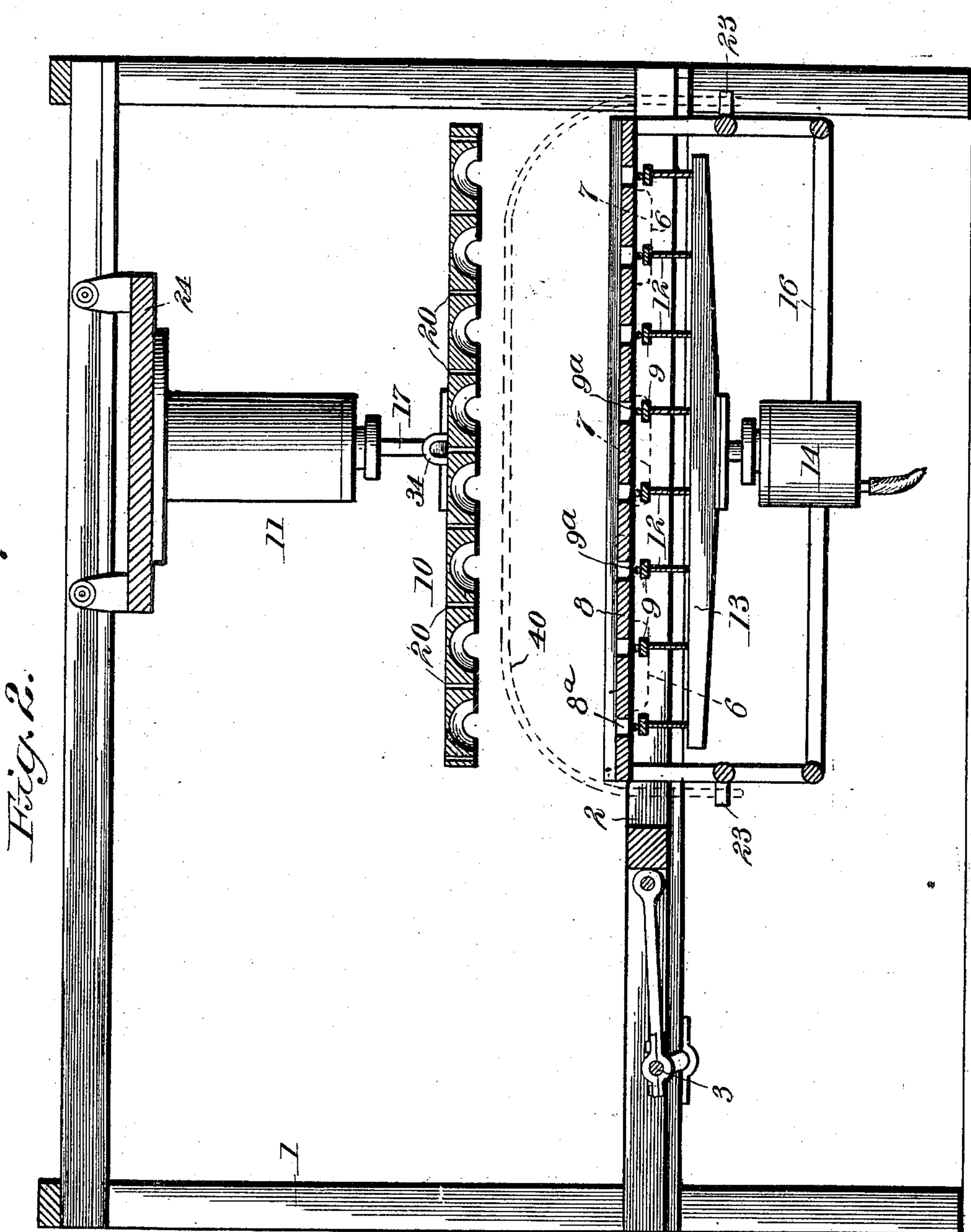
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3 SHEETS—SHEET 2.



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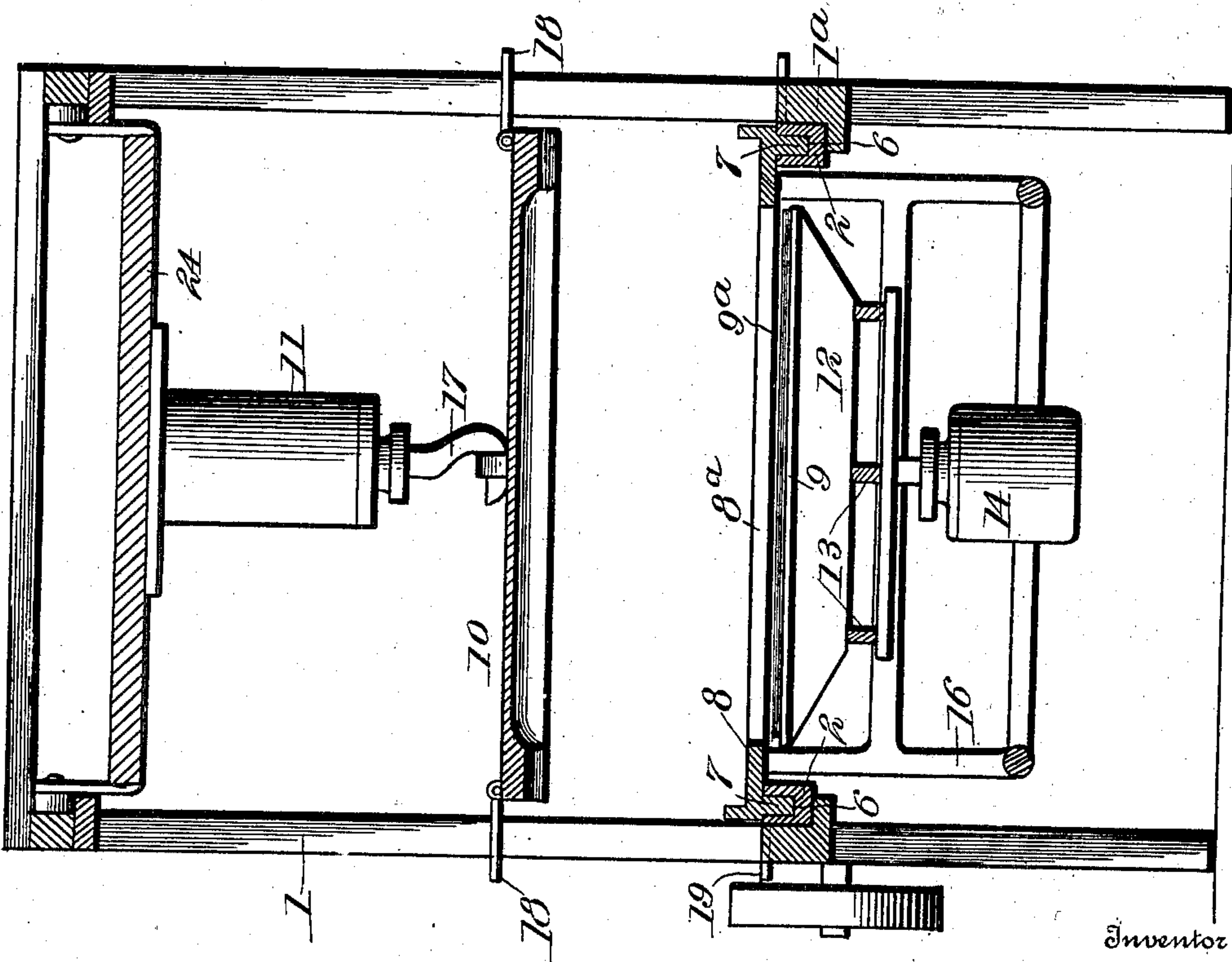
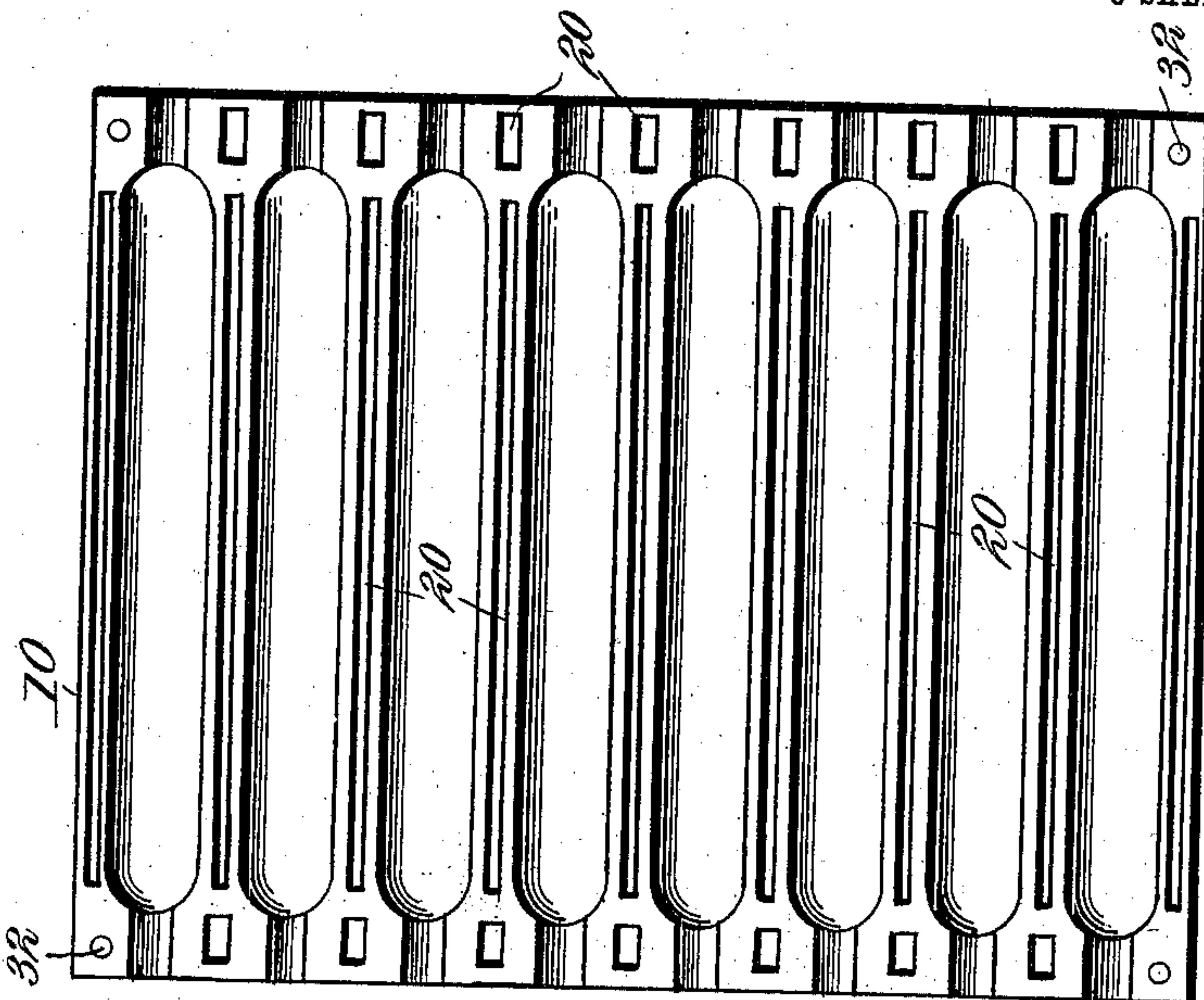
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3 SHEETS—SHEET 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN F. NOLAN, OF CHICAGO, ILLINOIS.

## MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 719,250, dated January 27, 1903.

Application filed May 2, 1902. Serial No. 105,643. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN F. NOLAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Molding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to molding-machines, and particularly to machines for molding cores, such as for pipe, radiator, and similar hollow-ware castings.

As cores are now formed the prepared sand is placed in the core-boxes and rammed therein, either by hand or otherwise, to form a firm and solid core. The cores so formed are made one by one and the operation is comparatively slow.

The object of my invention is to provide means for molding a number of cores at the same time with the least amount of hand-work.

A further object of the invention is to provide improved means for embedding the core and vent rods in the cores.

A further object is to generally simplify, improve, and expedite the making of sand cores.

With these and other objects in view an embodiment of the invention is hereinafter described, and is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the core-molding machine. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a vertical cross-section of the same. Fig. 4 is an inner or face view of a half core-box, such as is used in molding pipe-cores.

Generally speaking, my invention embodies the idea of a vibrating sand-plate containing a bed of sand thereon, into which a half core-box is forced until it reaches the plate. The sand on the plate is in consequence of the pressure on the core-box and the vibration of the sand-plate forced and compressed into the molds of the core-box. The surplus sand works up through openings

formed in the core-box. A half-box so formed is joined to a corresponding half-box formed in the same manner to form the cores.

In the drawings the molding of cylindrical pipe-cores is illustrated, and 1 indicates the frame of the machine, having horizontal parallel ways (indicated at 1<sup>a</sup>) on which rests a frame 2, to which a horizontal reciprocating or shaking motion is given by a crank 3 of small throw. Any proper means to drive the crank-shaft may be used. The frame 2 is open at the end opposite the crank to permit the removal therefrom of the sand-plate, now to be described.

The sand-plate is indicated at 8, having raised edges to hold the depth of sand desired. This plate rests at its side edges upon the sides of frame 2 and has studs 7, which fit into recesses 6 in the frame, so as to move therewith. The sand-plate has a number of slots or openings 8<sup>a</sup> therethrough, which correspond in number and shape to the cores to be molded. These slots are smaller or narrower than the cores and are made for the purpose of permitting the insertion of the core and vent rods. During the compression of the sand in the core-box the slots are closed by strips 9, which rest upon cross-pieces 12, which in turn are supported by stringers 13 within and upon a hanging frame or brackets 16, depending from the bottom of the sand-plate. An air-press 14 or other lifting device is interposed between the framework and the stringers 13 for the purpose of raising and lowering the strips 9. Normally the strips 9 are raised flush with the sand-plate.

The half core-box is indicated at 10, having the molds for the pipe-cores, and is forced into the sand upon the sand-plate by pressure from an air or hydraulic press, (indicated at 11,) from which it is hung, as by a hook at the end of the piston-rod 17, the whole being suspended from a traveling hanger 24 to facilitate shifting and handling.

In the operation of the above-described parts of the apparatus the prepared sand is placed on the sand-plate and the core-box is lowered thereon under pressure. The frame 2 and the sand-plate carried thereby are then vibrated or shaken by means of the crank 3, and the combination of the pressure and the motion causes the core-box to sink slowly into the sand to the sand-plate. The reciproca-



tion of the sand-plate is fast enough only to allow the core-box to work its way through the sand and pack the same therein and not fast enough to cause the sand to spill or to pile up toward the middle of the plate. The surplus sand works up through the openings 20 in the core-box. When the core-box reaches the sand-plate and the sand is thoroughly packed in the molds, the motion is stopped, and the strips 9 are then lowered from the sand-plate by means of the air-press 14. The metal core-rods (indicated at 9<sup>a</sup>) are then placed upon and along the strips, as shown in Figs. 2 and 3, which are then raised by the press and the rods forced into the half-cores in the box. The half core-box and sand-plate are then clamped together in any proper manner, as by ordinary screw-clamps, and are ready to be lifted out and the half-box laid aside to be joined to another half-box. The lifting and carrying may be conveniently done by means of a yoke or bail 40 from the press 11, the ends of the bail being hooked over trunnions 23, projecting from the framework of the sand-plate. Preferably the core-rods are inserted in the manner described in the half-core in one half-box and the vent-rods inserted in the same manner in the complementary half-box.

18 and 19 indicate flanges projecting from the core-box and the frame of the machine, respectively, which flanges have registering holes through which dowel-pins are inserted when the core-box is lowered to prevent any vibration thereof. The flanges 18 are hinged, so that they will lie flat against the edges of the core-box during the subsequent operations.

In the construction above described and illustrated the machine appears as applied to the molding of pipe-cores; but it may be used for any other core forms, either regular or irregular. Half core-boxes containing molds of irregular shape may be attached to a plate corresponding to the half core-boxes herein shown, such plate to have escape-openings for the sand corresponding to the openings 20, above described. A number of cores can be molded at once, and a very rapid and efficient machine is thus formed for the purpose intended.

What I claim is—

1. A core-molding machine having, in combination, a sand bed, a core-box section having matrices and pressing and shaping means to force the section into the sand to fill the matrices.

2. In a core-machine, a shaking sand bed, a section of a divided core-box having multiple matrices, and means to force the core-box into the bed to fill the matrices.

3. The combination with a divided multiple core-box, of means to form core parts in the sections severally, and means to simultaneously insert core-rods in the core parts.

4. In a core-molding machine, the combination with a horizontally-vibrating sand-plate,

of a vertically-movable section of a multiple core-box, and means to force the same into the sand upon the plate.

5. In a core-molding machine, the combination with a horizontally-vibrating plate having sand thereon, of a vertically-pressed core-box section having escape-openings for the surplus sand.

6. In a core-molding machine, in combination, a horizontally-vibrating frame, a removable sand-plate thereon carrying the molding-sand, and a vertically-movable core-box section adapted to be forced into the sand upon the plate.

7. In a core-molding machine, the combination with a section of a multiple core-box, of a shaking sand-plate having a series of removable sections corresponding to the matrices of the core-box, and means to force the box into the sand to contact with the plate.

8. In a core-molding machine, the combination with a shaking sand-plate and a section of a divided multiple core-box, said sand-plate having slots corresponding to the core-matrices for the insertion of rods, removable closures for said slots, and means to force the core-box section into the sand upon the plate.

9. In a core-molding machine, the combination with a shaking sand-plate having slots through which rods may be inserted, and a core-box section and means to force the same into the sand upon the sand-plate, of removable closures for said slots.

10. In a core-molding machine, the combination with a section of a divided core-box having a plurality of core-matrices therein, of means to compress sand and insert rods in the matrices of said section.

11. In a core-machine, a horizontal vibrating sand-plate having openings through which rods may be inserted, removable closures for said openings, a core-box section and pressure mechanism to force the same downward into the sand upon the plate, and pressure mechanism below the sand-plate to force rods through the openings into the core-sections.

12. In a core-machine, in combination, a supporting-frame, a vibrating frame sliding in ways thereon, a removable sand-plate upon the vibrating frame having core-rod openings, a pressure device under the sand-plate, carrying removable closures for the openings, a multiple core-box section above the plate having matrices corresponding to the openings, and pressure mechanism to force the core-box into the sand upon the sand-plate.

13. In a core-machine, in combination, a sand-plate having a bed of sand thereon, a multiple core-box under pressure on the sand, and means to vibrate the sand to permit the core-box to be forced down to the plate.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN F. NOLAN.

Witnesses:

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