No. 719,280.

PATENTED JAN. 27, 1903.

F. H. VAN HOUTEN.

DOUGH DIVIDER.

APPLICATION FILED MAY 21, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

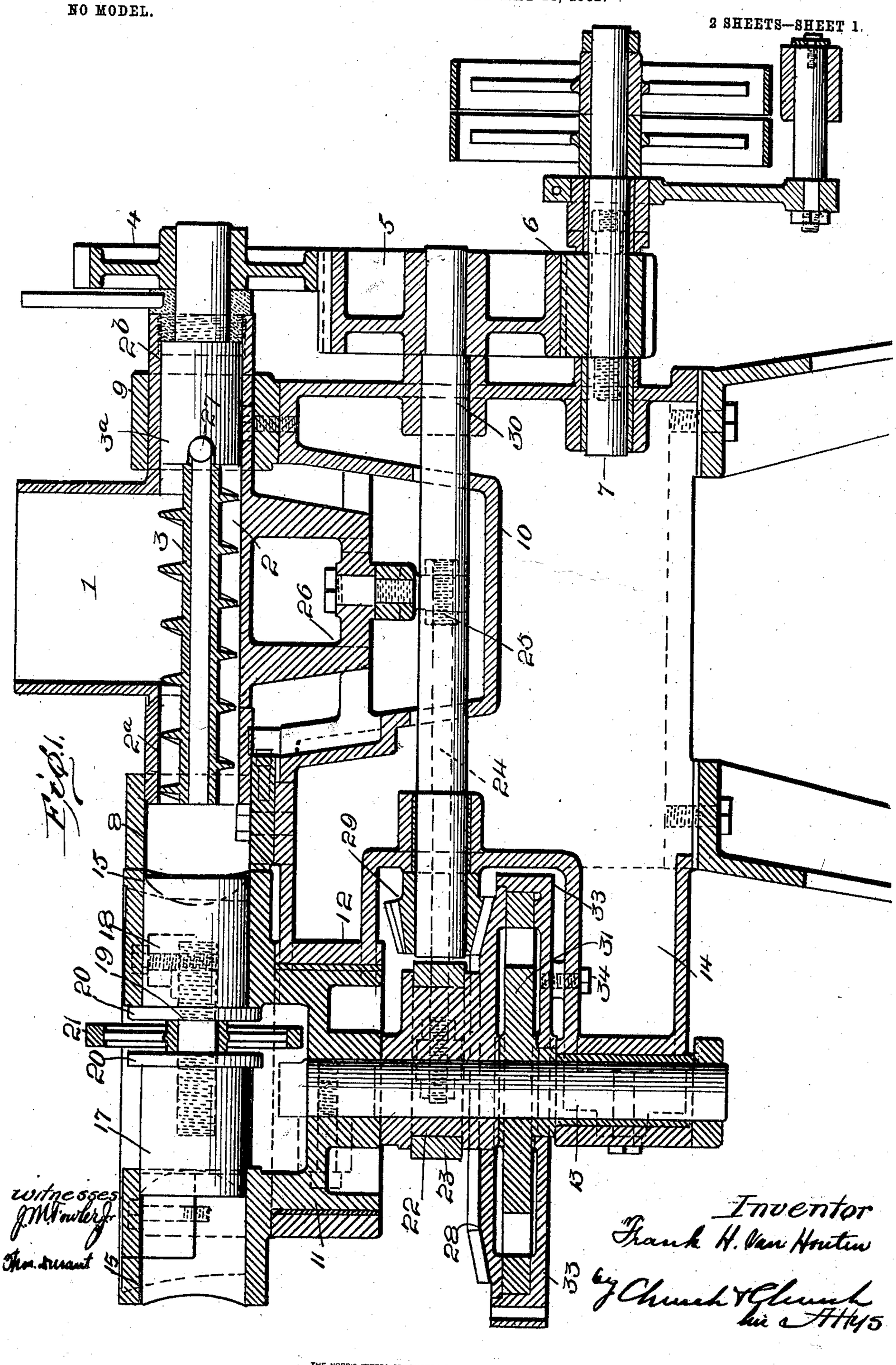

Fig. 1.

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NO MODEL. 2 SHEETS—SHEET 2.

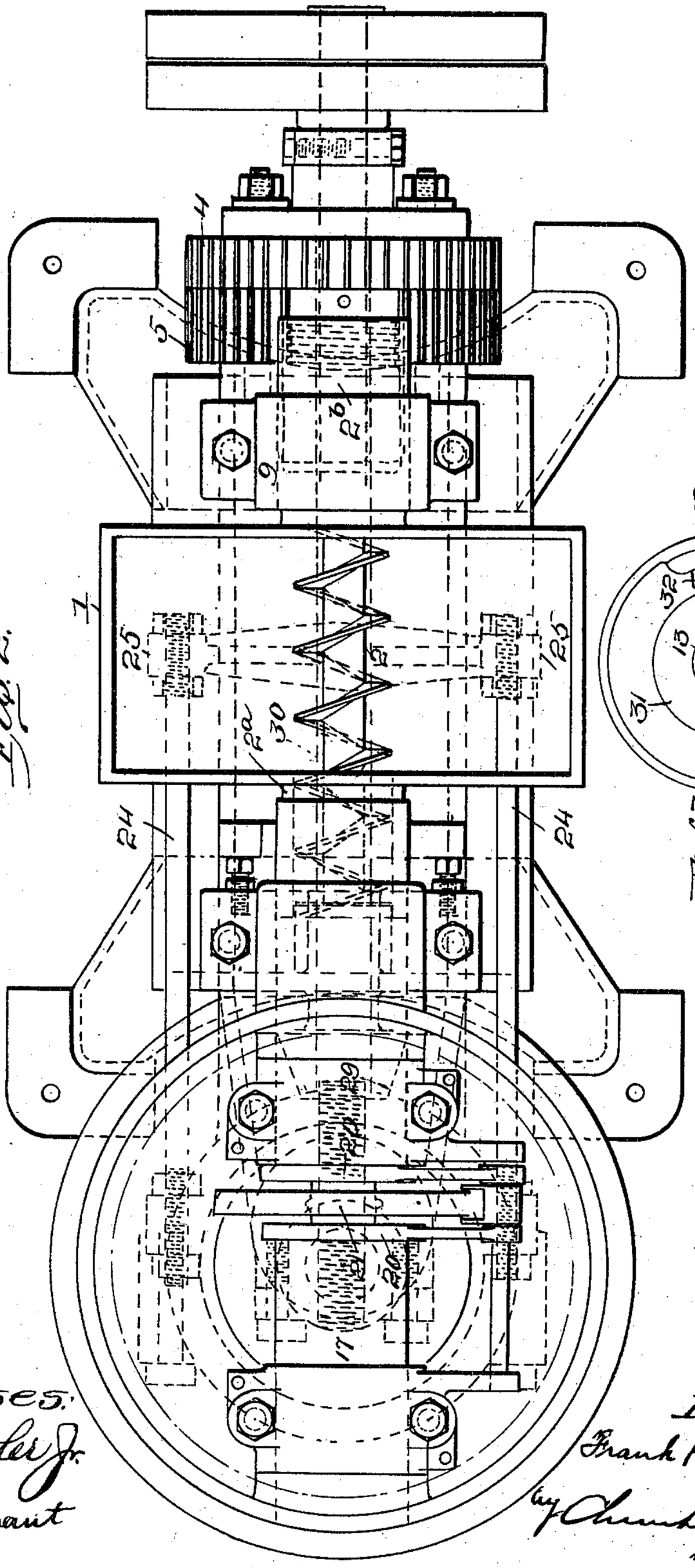

Fig. 2.

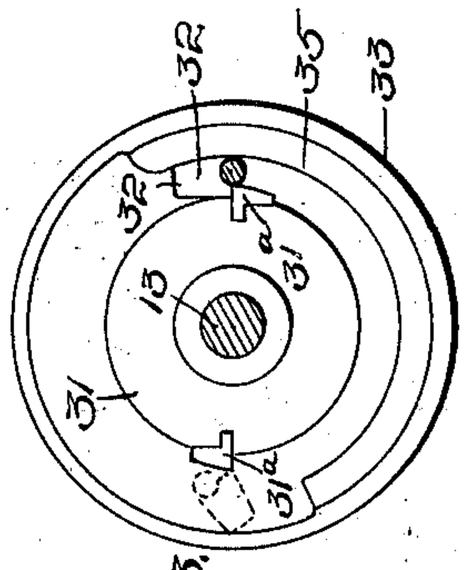

Fig. 3.

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UNITED STATES PATENT OFFICE.

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DOUGH-DIVIDER.

SPECIFICATION forming part of Letters Patent No. 719,280, dated January 27, 1903.

Application filed May 21, 1902. Serial No. 108,375. (No model.)

To all whom it may concern:

Be it known that I, FRANK HENRY VAN HOUTEN, of Fishkill-on-the-Hudson, in the county of Dutchess, State of New York, have invented certain new and useful Improvements in Dough-Dividers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures of reference marked thereon.

This invention relates to machines employed for automatically dividing predetermined quantities of plastic material, as dough, from a large mass and for forming and compressing the same to the desired consistency.

The object of the invention is to increase the general efficiency of machines of this type, and particularly to provide simple and efficient means for regulating the areas of the molds and facilitating the discharge of the same, for regulating the feed of the plastic material into the molds to avoid wasting the same, and to provide a vent for any excess of feed to avoid choking the machine.

With these objects in view, and such others as will readily suggest themselves as the nature of the invention is understood, the same includes a pair of mold-chambers provided with means for effecting the discharge from one while the companion mold is being filled.

It further includes means associated with a constantly-operating feed device to prevent the materials fed thereby passing out of the discharge-mouth with which the molds register when the latter are out of alinement with the same.

It further includes a vent or by-pass leading from the front end of the feeding device to the rear thereof to permit of the return to the feed-chamber of any excess of material which may be fed by said feeding device; and it further includes the details of construction as will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which illustrate one embodiment of my invention, Figure 1 shows a vertical sectional view of a complete machine. Fig. 2 is a plan view of the same, and Fig. 3 is a detail view of the means for giving the mold-carrier an intermittent feed.

In the accompanying drawings the feed-hopper is indicated by the numeral 1, discharging into a feeding-chamber 2, in which a feed-screw 3 is located, said feed-chamber having front and rear tubular extensions 2^a 2^b. The front end of the screw 3 terminates flush with the end of the extension 2^a, while the rear end of said screw is secured to a shaft 3^a, journaled in the extension 2^b and provided with a drive-gear 4, in mesh with a transmitting-gear 5, to which rotation is imparted by a pinion 6, secured to the main drive-shaft 7.

The extensions 2^a 2^b of the chamber 2 are slidably mounted in collars 8 9, bolted to the main supporting-frame 10, the collar 8 also providing a temporary receiving-chamber and guide for the material fed by the screw 3, as will be hereinafter described.

In the present embodiment of the invention a single pair of molds or formers are provided, each comprising a cylindrical barrel secured to or integral with a carrier 11, journaled in an arm 12, extending from the frame 10 and fixed to the upper end of a vertical shaft 13, journaled in an arm 14 of the frame, to which an intermittent rotary movement is imparted by mechanism to be described. The molds or barrels 15 are arranged in alinement with each other and are provided with bottoms or ends which are adjustable to vary the maximum depths of the molds and shiftable to provide for the discharge of the formed material. These bottoms comprise pistons 17 18, fitted to the bores of the barrels 15 and connected to move in unison by means which permit of their simultaneous adjustment. In the present instance the means is shown as a compound adjusting-screw 19—that is, a screw having its ends provided with oppositely-running threads engaging corresponding threaded openings in the adjacent pistons—and a milled disk 21, keyed thereto centrally of the same. By turning said screw the pistons can be adjusted relatively to each other, while the screw also provides a rigid coupling between the same. Each piston is provided with an annular shoulder 20 at its inner end to provide a limiting-stop to prevent the front end of

the same passing beyond the end of the mold-chamber with which it is associated. It will be understood that the mold-chamber in each barrel is formed between the inner periphery of the same and the face of the piston associated therewith, and consequently the areas of the chambers can be regulated by adjusting the pistons through the medium of the screw 19. When the rear ends of the pistons are in such positions that they abut against the hub of the disk 21, as shown in Fig. 1, said pistons are retracted the maximum extent, and mold-chambers of maximum areas are presented. In the intermittent rotation of the carrier 11 the ends of the barrels 15 are brought successively into register with the front end or discharge-mouth of the collar 8 for determinate periods. During these periods the plastic material, which is continually fed forward by the screw 3, (the latter having a constant rotary movement during the operation of the machine,) is pushed into the mold-chamber in register with said discharge-mouth by the front end of extension 2^a and the end of the screw 3, which act together as a plunger, the feed-chamber being reciprocated for this purpose. The reciprocation of this chamber is secured by means of a cam 22, secured to the shaft 13, over which a strap 23 is fitted, connected by links 24 to a cross-bar 25, bolted to a bracket 26, depending centrally from the bottom of the chamber 2. The movements of the parts are so timed that the chamber 2 is forced forward while one of the mold-chambers is in alinement therewith, and the material which is in advance of the screw is pushed into the said chamber, against the movable piston therein. At this time the piston in the chamber being filled is near the mouth of the same, and consequently as the material is fed therein said piston is pushed back until the shoulder of the companion piston abuts against the edge of the companion mold. As will be understood, the latter piston is forced into the mold-chamber with which it is associated during the period the first-mentioned piston is being forced back and will act to discharge the contents of the mold out of alinement with the collar 8. Each mold remains in register with the mouth of the collar 8 a sufficient period to be filled, and then the shaft 13 is given a one-half revolution, which carries the filled mold to a position diametrically opposite to the mouth of the collar 8 and the empty mold into register therewith. The advance of the extension 2^a and screw 3 in pressing the material which has been fed forward by said screw into the mold-chamber forces, as before described, the piston located therein backward, and through the rigid coupling 19 the companion piston is forced forwardly in the mold-chamber with which it is associated, and thus discharges the formed material therein from the same. As the mold-carrier is rotating to move one mold out of register with the collar 8 and the companion mold into register therewith the chamber 2 is given its rearward reciprocation. The material which is fed by the screw 3 beyond the end of the extension 2^a during the period the molds are out of alinement with the collar 8, and consequently not in position to receive said material, enters the bore of said collar and is held therein until the chamber 2 comes forward on its forward stroke, when said material is forced into the mold-chamber, as before described, which has by this time come into register with the mouth of the collar.

To prevent the machine choking through the accumulation of an excess of material in advance of the extension 2^a, a vent or by-pass is provided to return any excess of feed to the rear of the screw. As shown in the present drawings, this vent is provided by an axial bore extending through the screw 3 and leading into the rear of the chamber 2 through a radial opening 27 in the shaft 3^a.

To drive the shaft 13, which has an intermittent rotation, a beveled gear 28 is journaled thereon, which may be formed integral with the cam 22 and which is driven continuously by a beveled pinion 29, fixed or keyed to one end of a shaft 30, to the opposite end of which the gear 5 is secured. A disk 31 is secured to the shaft 13 and is provided with two diametrically-arranged fixed stops 31^a, with which a dog 32, pivoted to the under face of the gear 28, is designed to interlock. To control the position of the dog 32, a disk 33 is provided, mounted upon the hub of the disk 31 and held against rotation by a pin 34, extending through the arm 14 and engaging the same. The disk 33 is provided with a vertical wall 35, extending around one-half of the inner circumference of a flange formed thereon, and this wall coacts with the periphery of the disk 31 to provide a guiding-channel in which the dog 32 travels in the rotation of gear 28. When the dog enters said channel, it is thrown into the path of the fixed stops, and in the rotation of the gear 28 it engages one of said stops and couples the gear and disk 31 together, so that they will rotate in unison until the dog 32 passes entirely through the guiding-channel or past the end of the wall 35, when said dog will rotate upon its pivot and free itself from the stop with which it is in engagement. The gear 28 will then rotate independently of the disk 31 until the dog carried by the former again enters said channel. The stops are so placed relatively to the channel that a one-half revolution will be imparted to the shaft 13 for each complete revolution of the gear 28. During the period the shaft is at rest one of the molds is being filled, while the companion mold is discharging.

By forming the gear 28 and cam 22 integral the latter is given a constant movement, and through the connections before described the chamber 2 is given a continuous reciprocating movement during the operation of the machine.

I claim—

1. In a machine of the class described, the combination with a reciprocating feed-chamber and a mold adapted to be carried into and out of alinement therewith, of a temporary receiving-chamber interposed between the feed-chamber and mold and means for varying the capacity of the receiving-chamber, whereby the material is stored when the mold is out of register, substantially as described.

2. In a machine of the class described, a reciprocating feeding device, means for guiding said device and forming a temporary receiving-chamber, a mold adapted to be carried into alinement therewith when the feeding device is advancing and out of alinement therewith when the feeding device is receding and means for maintaining a constant supply to the receiving-chamber, substantially as described.

3. In a machine of the class described, a reciprocating feeding device, comprising a feeding-chamber having tubular extensions, a feed-screw, collars forming guides for said extensions, and a mold adapted to be carried into and out of register with one of said collars, substantially as described.

4. In a machine of the class described, and in combination, a feed-chamber, a screw journaled therein, with means for giving the same a constant rotary movement, a mold with means for carrying the same into and out of filling position, a temporary receiving-chamber, and means for reciprocating said feeding-chamber, whereby the latter will force the material from said temporary receiver into the mold, substantially as described.

5. In a machine of the class described, and in combination, a feed-chamber, a feed-screw journaled therein, with means for giving the same a constant rotary movement, a mold-carrier, a pair of molds associated therewith, a shaft carrying the same, means for giving the latter an intermittent rotary movement, a cam journaled on said shaft, means for giving the latter a constant rotary movement, and means interposed between the same and the feed-chamber for imparting a constant reciprocatory motion to the latter, substantially as described.

6. In combination in a machine of the class described, a feed-chamber, a feed-screw journaled therein and means for giving the same a constant rotary movement, a mold-carrier, a pair of molds associated therewith, a shaft carrying the same, means for giving the latter an intermittent rotary movement, including a beveled gear, a cam, journaled on said shaft driven from said gear, a strap engaging the cam, and link connections between said strap and the feeding-chamber, substantially as described.

7. In combination in a machine of the class described, a feeding-chamber, a feed-screw journaled therein and means for giving the same a constant rotary movement, a mold-carrier, a pair of molds associated therewith, a shaft carrying the same, and means for giving the latter an intermittent movement, including a beveled gear, a disk fixed to the shaft, stops projecting from said disk, a dog carried by the gear, designed to coact with said stops, and a controller for said dog, substantially as described.

8. In a dough-dividing machine, the combination with a movable measuring-head having a measuring-chamber therein and a receiving-chamber from which the dough is delivered to the measuring-chamber, of a constantly-acting feeder delivering dough to said receiving-chamber and a reciprocatory feeder for discharging the dough from the receiving-chamber when the measuring-chamber is in position to be filled and for increasing the capacity of said receiving-chamber when dough is not being discharged therefrom; substantially as described.

9. In a dough-divider, the combination with a supply-hopper and an adjustable measuring-chamber into which the dough is fed from the hopper, of a reciprocatory feeder for feeding the dough to the measuring-chamber and a relatively long by-pass passage leading from a point in front of the feeder back to the supply-hopper whereby the feeder may have a definite movement and the dough be compressed uniformly regardless of the adjusted capacity of the measuring-chamber; substantially as described.

10. In a machine of the class described, in combination, a main supporting-frame, guiding devices secured thereto, a feeding-chamber supported in said devices, a constantly-driven feed-screw journaled in said chamber, a vertically-arranged shaft, a mold-carrier surmounting the same, a pair of molds associated with said carrier, including alining barrels, a piston associated with each barrel, a compound screw coupling said pistons together, a beveled gear journaled on said shaft, a cam also journaled on said shaft and driven from said gear, means interposed between said cam and feed-chamber for reciprocating the latter, a pinion meshing with said beveled gear, a shaft journaled in the main frame carrying said pinion, a transmitting-gear secured thereto, means for driving the same from the main drive-shaft of the machine, gearing interposed between the same and the feed-screw, a disk fixed to the vertical shaft, a pair of fixed stops projecting from said disk, a dog pivoted to said beveled gear, designed to coact with said stops, and a controller for said dog, comprising a stationary disk having a wall coacting with the periphery of the first disk to provide a guide-channel for said dog, substantially as described.

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