G. E. GOWDY.

MACHINE FOR DIVIDING PLASTIC MATERIAL INTO CHARGES.

APPLICATION FILED MAR. 23, 1908.

938,051. Patented Oct. 26, 1909.

4 SHEETS—SHEET 1.

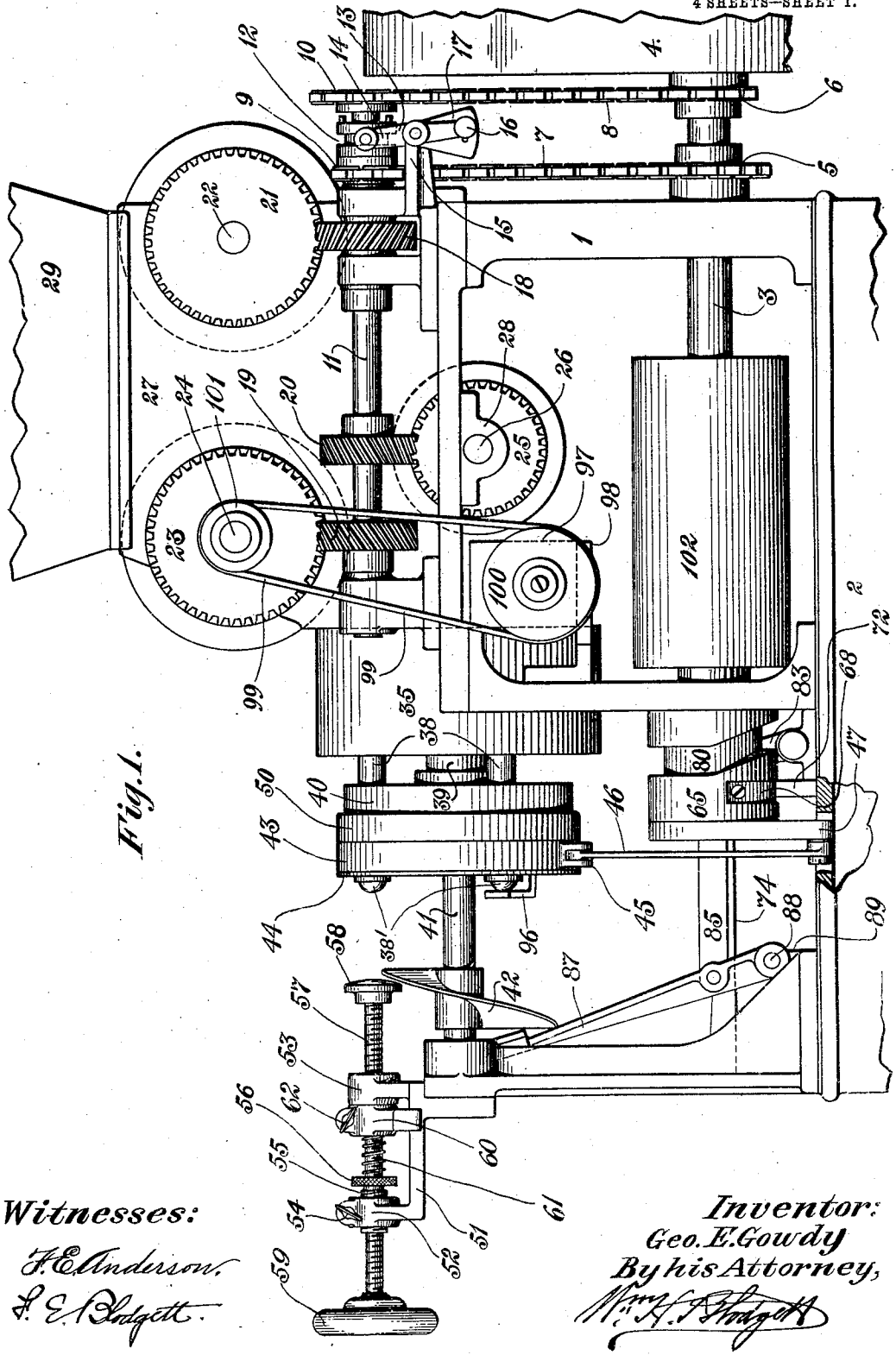

Fig. 1.

Witnesses:

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Inventor:

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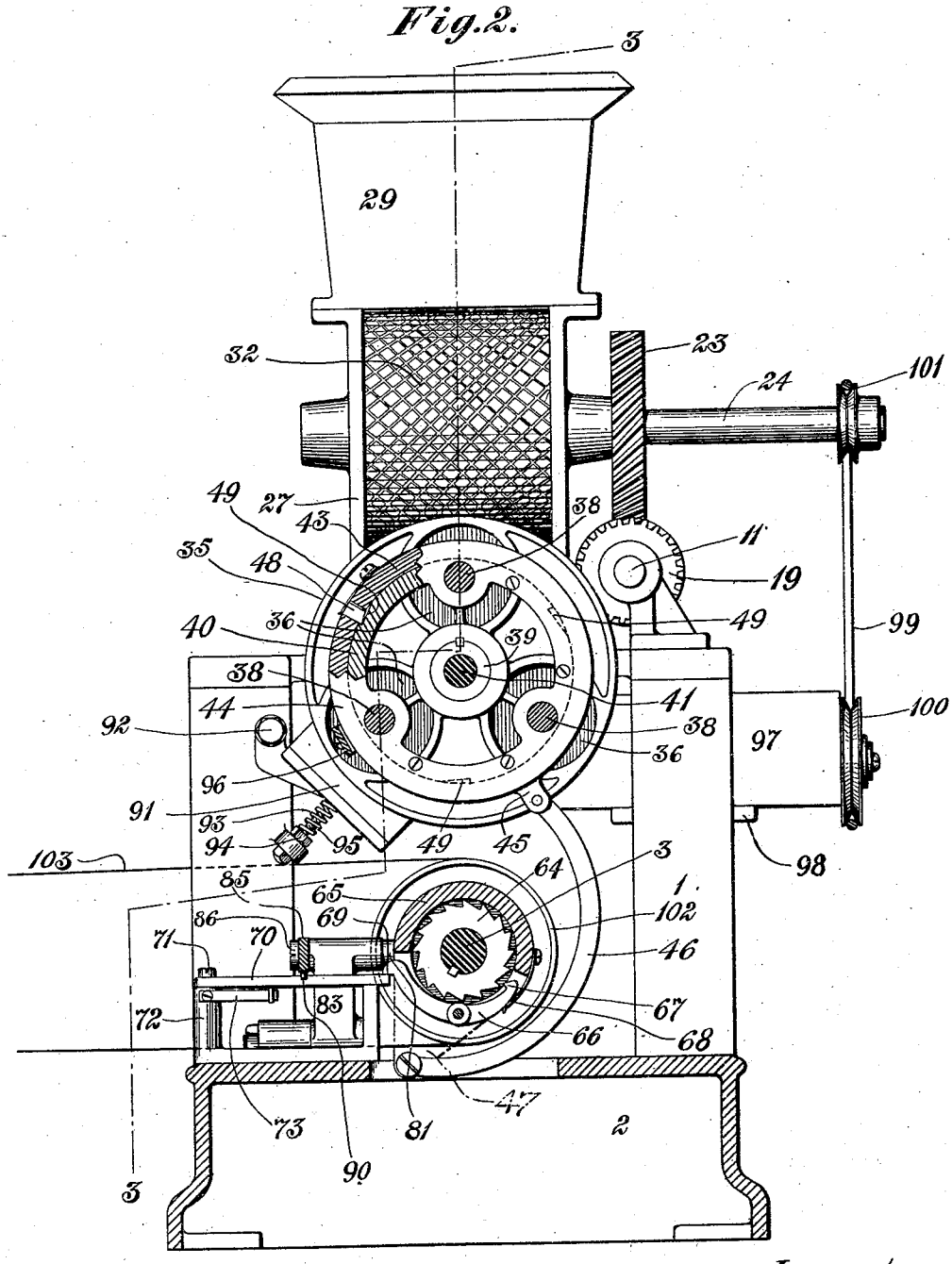
4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

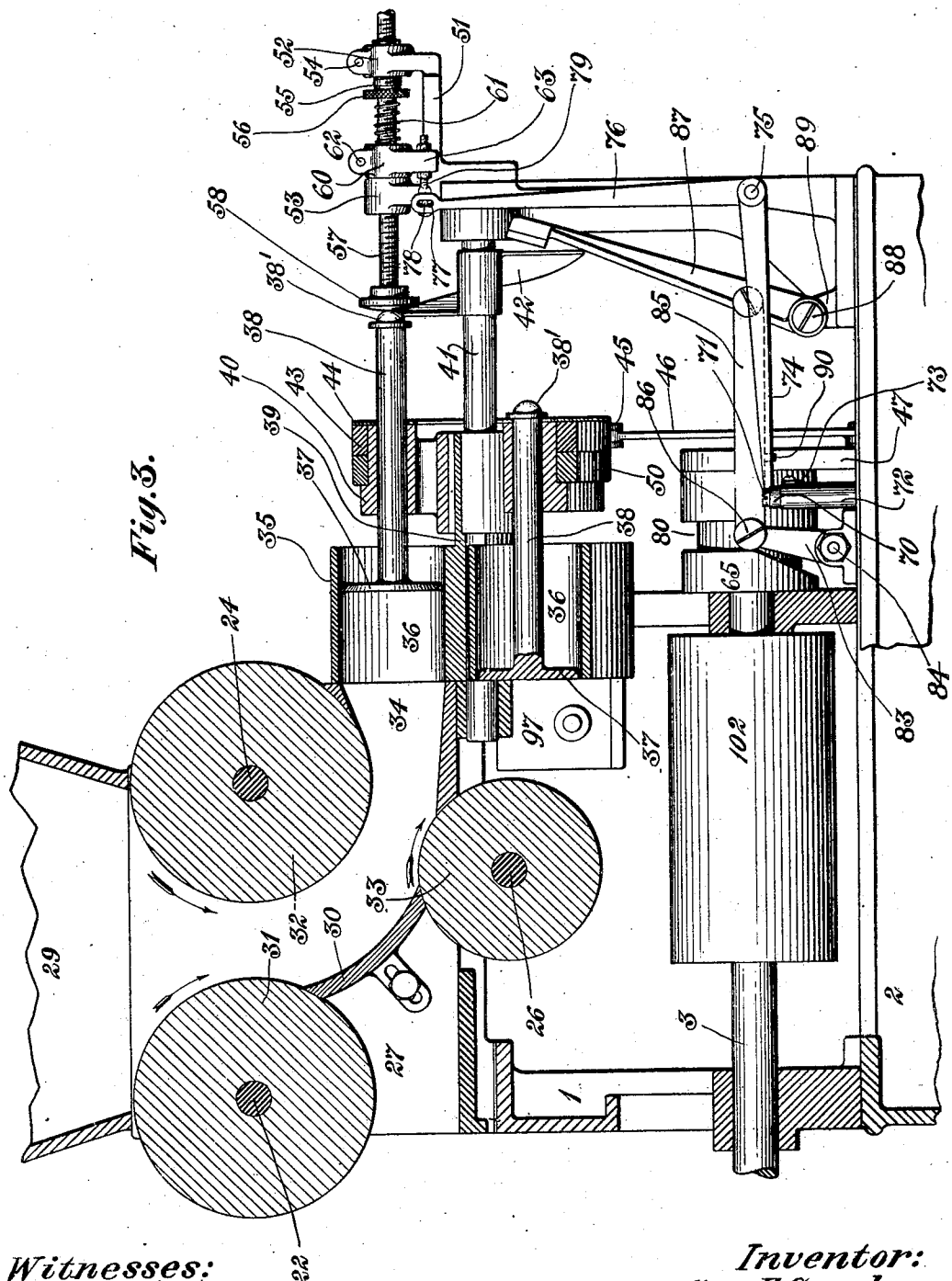

Fig. 3.

Witnesses:

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4 SHEETS—SHEET 4.

Fig. 4.

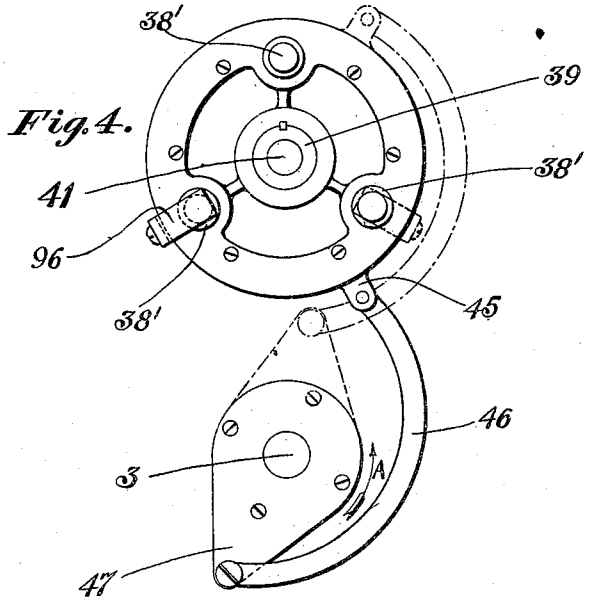
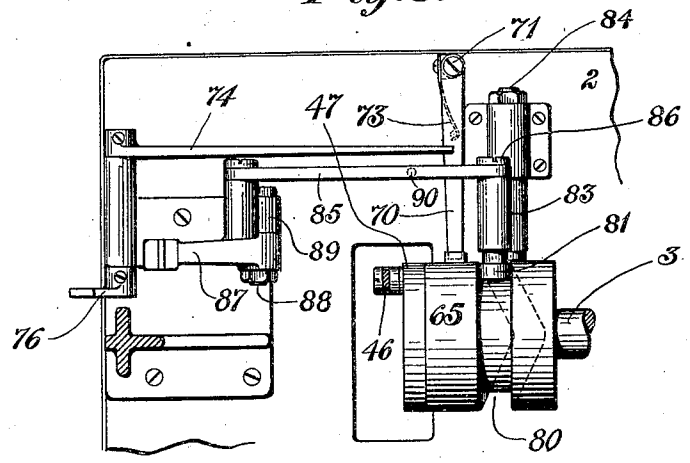


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE E. GOWDY, OF BELLEVILLE, NEW JERSEY.

MACHINE FOR DIVIDING PLASTIC MATERIAL INTO CHARGES.

938,051. Specification of Letters Patent. Patented Oct. 26, 1909.

Application filed March 23, 1908. Serial No. 422,612.

To all whom it may concern:

Be it known that I, GEORGE E. GOWDY, a citizen of the United States, residing at Belleville, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Machines for Dividing Plastic Material Into Charges, of which the following is a specification.

This invention relates to machines for working plastic material, and while more especially designed for employment in the art of molding dough into charges of equal dimensions is limited to no specific use. In this class of machines a rotary carrier has been employed, said carrier being provided with pockets for receiving charges of plastic-material forced successively into said pockets by feed-mechanism,—each pocket containing a plunger or piston against which the material is fed, and which on the impact of said material will recede until it engages a stop. Mechanism in this style of machine is also provided for intermittingly rotating the pocket-wheel or carrier, so that when one pocket has received a charge the wheel will be turned to bring the filled pocket to a point where the charge is ejected by a forward movement of the plunger. Connected with the pocket-wheel, and intermittingly rotatable therewith, is a head through openings in which the piston-rods pass, and the means for rotating said pocket-wheel are applied to said head and, therefore, drive the wheel and the head together in an arcuate path.

One object of the present invention is the provision of means for automatically controlling mechanism which causes charges of plastic material to be transferred in receiving pockets to a desired point, and there ejected.

A further object of the invention is the provision of means for braking an element of the device for rotating the head and pocket-wheel.

A further object of the invention is the provision of details in the operating mechanism for driving the feed-rolls, whereby said feed-rolls may be rotated at varying speeds.

Other objects of the invention will be set forth in the now following detailed description.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying the features of my invention. Fig. 2 is an end view of said machine, partially in section. Fig. 3 is a longitudinal, vertical section of said machine on line 3—3 of Fig. 2, parts being in elevation. Fig. 4 is a detail view in end elevation of means for intermittingly-rotating the pocket-wheel; and Fig. 5 is a plan view of details of the mechanism to be hereinafter described.

Like characters designate similar parts throughout the several views.

Referring to the drawings, the frame of the machine is designated by the numeral 1, and it may be of any approved construction, and is mounted upon a base 2. In said frame is journaled a driving-shaft 3 to which any suitable device, such, for instance, as a pulley 4 may be attached for applying power to said driving-shaft. Keyed to the driving-shaft are sprocket-wheels 5 and 6 of different diameters which through sprocket-chains 7 and 8 drive similar sprocket-wheels 9 and 10 respectively, the latter being loosely mounted upon a shaft 11 journaled in bearings at the top of the machine. Splined upon shaft 11 between the sprocket-wheels 9 and 10 is a clutch 12 adapted to be thrown either to a neutral position or into engagement with either of said sprocket-wheels. For operating this clutch any desired means may be employed, that shown consisting of a lever 13 having a fork 14 mounted in the groove of the clutch, said lever being pivoted to a bracket 15 projecting from the frame and being operated by a handle 16 having a detent working in holes or notches of a plate 17 in a common manner, and serving to lock the lever and clutch when thrown in either direction.

Rigidly mounted on shaft 11 are spiral gears 18, 19 and 20 meshing, respectively, with spiral gear 21 on shaft 22, spiral gear 23 on shaft 24 and spiral gear 25 on shaft 26. Shafts 22 and 24 are journaled in bearings of a hopper support 27 and shaft 26 is journaled below said hopper support in bearings 28 secured to the machine frame 1.

Designated by 29 is a hopper into which the plastic-material to be worked is placed, and by 30 is an adjustable concave plate, the function of which will be hereinafter described. On the shafts 22 and 24 are mounted feed-rolls 31, 32 which will seize the material passing from the hopper 29 and advance

it into the throat formed by the space between the adjustable plate 30 and feed-roll 32. These feed-rolls compress the material to a certain extent and force it forward, and they are aided in this movement by a third roll 33 mounted on shaft 26, the periphery of said roll entering a slot located between the plate 30 and the open end 34 of the chute to which the material is delivered.

Any suitable mechanism may be substituted for the feed-device described without departure from the invention.

Designated by 35 is a pocket-wheel or carrier in each pocket 36 of which is mounted a piston 37 carried by a rod 38 having a rounded head 38′. This pocket-wheel has a hub 39 upon which is splined or otherwise rigidly connected a head 40 having a series of apertures for the reception of the rods 38,—the pocket-wheel being loosely mounted on a stationary shaft 41 journaled in bearings of the frame, and carrying rigid therewith a cam 42 that will be hereinafter explained.

Surrounding the reduced portion of the head 40 is a loosely mounted ring 43 which is held thereon by a plate 44, and connected to a lug 45 on said ring is a curved pitman 46, attached at its lower end to a crank-arm 47 hereinafter described. Carried by said ring 43 is a spring-actuated pawl 48, said pawl being adapted to engage the ratchet-teeth 49 on the periphery of the head 40. An annular collar 50 is located between the inner edge of the ring 43, and the shoulder on the head, said collar serving as a spacing piece properly to locate the position of the ring.

Secured upon the outer support of the shaft 41 is a bracket 51 having a split-bearing 52 and a plain bearing 53. Threaded into the split-bearing, which is provided with a clamp-screw 54 is a bushing 55 having a knurled head 56, and mounted in the bores in bushing 55 and bearing 53 is a screw 57 provided at its inner end with a head 58, and at its outer end with a hand-wheel 59. Between the knurled head 56 of bushing 55 and the bearing 53 a split-collar 60 is threaded upon the screw 57, and it is forced against bearing 53 by a spring 61 surrounding said screw,—the tension of said spring 61 being varied as desired by adjusting the bushing 55, against the head 56 of which said spring acts. Split-collar 60 is provided with a clamp-screw 62 and projecting from its underside for a purpose hereinafter described is an arm 63.

On the shaft 3 is keyed a ratchet-wheel 64, and pivoted in the slotted wall of a recessed sleeve 65 loosely mounted on said shaft, and adjacent the ratchet-wheel is a pawl 66 having an engaging tooth 67 at one end and being normally thrown into a position to engage the ratchet-wheel by a spring 68 secured to the periphery of the sleeve. At its opposite end an arm of this pawl is provided with a shoulder 69 adapted to engage the inner extremity of a lever 70 when said lever, which is pivoted at 71 on a vertical standard 72 projecting from the base, is in the position shown in Fig. 5. Said lever is held in this position against the tension of a spring 73 by an arm 74 which is secured to one end of a rock-shaft 75. To the other end of this rock-shaft is secured a similar arm 76 having in its free end a slot 77 engaged by a pin 78 projecting from an adjustable rod 79 carried by the arm 63 of split-collar 60. The arms 74 and 76 extend at right angles to each other from the rock-shaft 75, the joint construction constituting a bell crank-lever. A slight longitudinal movement of the screw 57 together with the split-clamp 60 tending to compress spring 61 will through the pin and slot connections described, arm 76, and rock-shaft 75, cause arm 74 to release lever 70 so that spring 73 will throw it out of engagement with shoulder 69 of pawl 66, thereby allowing said pawl to engage ratchet-wheel 64.

Secured to the end of recessed sleeve 65 is the crank-arm 47 before mentioned, and in the periphery of said sleeve 65 is a cam-groove 80 adapted to receive a roller 81 which is secured to one side of an arm 83 pivoted at 84. On the other side of said arm one end of a link 85 is pivoted on a stud 86, and the other end of said link is pivoted to an arm 87 mounted on a stud 88 secured in a lug 89.

Designated by 90 is a pin in the under side of link 85 which serves a purpose hereinafter described.

As the sleeve 65 is loose upon the continuously rotating shaft 3 it is obvious that the mechanism operated by cam-groove 80 and crank-arm 47 will remain idle when pawl 66 is out of engagement with ratchet-wheel 64.

Referring to Figs. 2 and 4 it will be seen that one revolution of crank-arm 47 which is intermittently rotated in the direction of the arrow A will cause an oscillation of the ring 43 of sufficient scope to turn head 40 and pocket-wheel 35 one-third of a revolution or just enough to bring the next cylinder to the right into register with the open end 34 of the chute. The full one-third revolution of the head 40 and pocket-wheel 35 takes place on the upward stroke of crank-arm 47, the ring 43 being retracted on the downward stroke thereof so that the pawl 48 will engage the next ratchet-tooth 49 to the right on head 40. A brake shoe 91 pivoted to the machine-frame at 92 and caused to bear upon the periphery of the pocket-wheel 35 by a spring 93, prevents any undesired movement of said pocket-wheel. The friction of the brake-shoe against the pocket-wheel may be varied by adjusting the

tension of spring 93 by means of the nut 94 on screw 95. During the downward stroke or last half of a revolution of crank-arm 47 cam-groove 80 causes arm 83, link 85, and arm 87, to be oscillated, thereby causing the piston which is in line with the end of arm 87 to be thrown to its extreme inward position. While in this position the rounded end 38′ on the end of the piston-rod 38 is adapted to be engaged by a right angled bracket 96 carried by the ring 43, said bracket serving to retain the piston with its end surface flush with the end of pocket-wheel 35, as shown in the lower cylinder Fig. 3, while it is carried past an opening (not shown) in a receptacle 97 mounted on a bracket 98 adjacent to the pocket-wheel. This receptacle contains suitable substance to apply to the pistons to prevent adherence thereto of the material being worked, said substance being kept in proper condition by an agitator (not shown) which is driven by a belt 99 passing over pulleys 100 and 101 the latter being secured to shaft 24.

Mounted on shaft 3 is a drum 102 over which a conveyer-belt 103 passes for delivering the material as it falls from the pocket-wheel 35.

Frequently, due to carelessness cleaning operations, or other causes, the piston-rods 38 are apt to be thrown outward, and, consequently, to interfere laterally with the head 58 and thus block the movement of the machine, and cause breakage of the parts. To prevent this action the cam 42 is employed, and, as will be seen from Figs. 1 and 3 the pistons 37 will always be thrown forward, thereby so as to clear said head.

In the operation of the machine, a quantity of plastic material is placed in the hopper 29 and power is applied to the pulley 4 to set the rolls 31, 32 and 33 in motion through gearing heretofore described. Rotation of said rolls causes the plastic-material to be fed through said opening 34 into the one of the pockets in line with opening 34, thereby forcing back the piston 37 in said pockets until the head 38′ of its rod 38 engages the head 58 of screw 57, said screw having been previously adjusted to allow the desired quantity of material to be received in the chamber 36. As soon as said pocket becomes filled the continued pressure therein causes the screw 57 to be forced backward together with collar 60, thereby actuating the arms 76 and 74 so as to release the lever 70. As before stated this allows the pawl 66 to engage the ratchet 64 after which the sleeve 65 rotates in unison therewith. The first half of a revolution of the arm 47 will through pitman 46, ring 43, pawl 48, and ratchet-teeth 49 turn the head 40 together with pocket-whel 35, one-third of a revolution, thereby bringing the next chamber 36 into register with the opening 34 of the chute, and causing the filled pocket to be moved opposite the free end of arm 87. During the second half of a revolution of arm 47 ring 43, through pitman 46, will be returned a little more than one-third of a revolution, so as to bring the pawl 48 slightly back of the next of a series of ratchet-teeth 49 corresponding in number to the pockets 36. When the filled pocket 36 is moved opposite the free end of arm 87, said arm is thrown forward together with link 85 and lever 83 by cam-groove 80 and in its forward movement arm 87 engages the end of the piston-rod in the filled pocket and forces the piston forward until it is flush with the outer surface of cylinder 35, thereby ejecting the measured charge of material upon the conveyer-belt 103. After one of the pistons 37 is thrown to its extreme forward position by the arm 87 it is held in said position by the bracket 96 while it passes the receptacle 97 for the purpose before mentioned. During the forward movement of the link 85 the pin 90 engages the lever 70 and forces it back against spring 73 until the arm 74 is caused by the tension of spring 61 to reëngage and hold it in position to trip pawl 66, and thereby arrest the rotation of sleeve 65 until the next pocket is sufficiently filled to repeat the indexing and ejecting operations.

Changes may be made in the various details of the machine without departure from the invention, the latter not being limited to the precise construction shown and described.

Having thus described the invention, what I claim is:

1. The combination, with a rotary carrier having a series of pockets, of a piston in each pocket; means for feeding material to the pockets; a stop for limiting the stroke of the pistons, and thereby controlling the amount of the charge in each pocket; a device for intermittingly-rotating the carrier-wheel; and means controlled by each piston at a certain point in the rotation of said carrier-wheel for positively throwing into action mechanism for driving forward the pistons to eject the charges from the pockets.

2. The combination of a rotary carrier having pockets, pistons mounted in said pockets and revoluble with the carrier, adjustable means coöperative with each piston for limiting the outward stroke thereof, a movable device for operating the pistons to cause them to eject the charges successively from said pockets, and means coöperative with said adjustable means for causing positively the rotation of the carrier and the action of said movable device.

3. The combination, with a rotary carrier having pockets, of pistons mounted in said pockets, each piston having a rod; means for

intermittently actuating said carrier; an adjustable stop engaging with each piston-rod, and serving to limit the proportions of the charge of material; a device carried by said stop; means actuated by said device for positively throwing into action the means for rotating the carrier; and a device also actuated by an element of said means for rotating the carrier for driving forward the pistons to eject charges from the pockets of said carrier.

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

GEORGE E. GOWDY.

Witnesses:
JNO. J. HOPPIN,
WM. D. GIBBY.