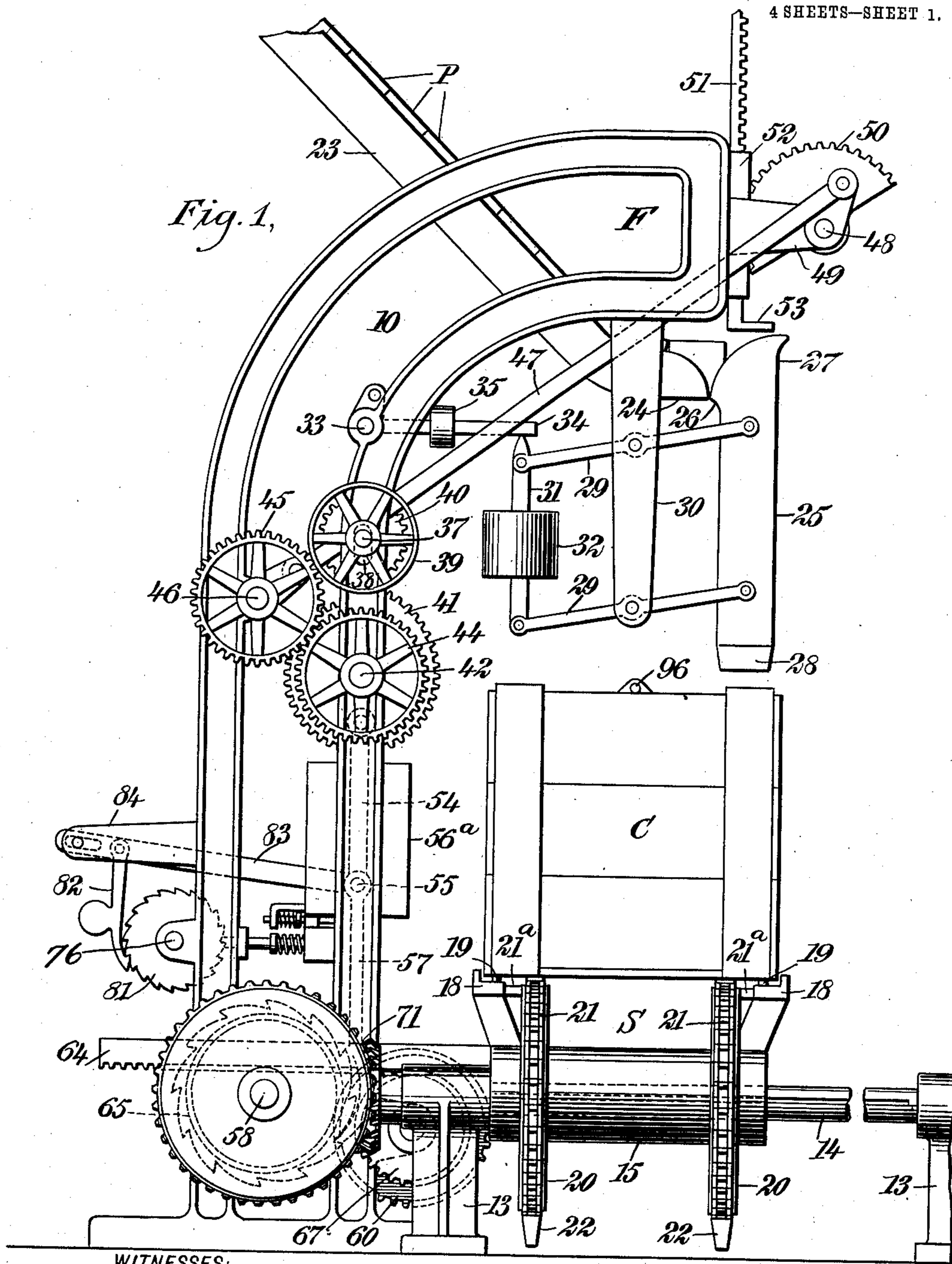


No. 859,772.

PATENTED JULY 9, 1907.

R. HOYT.
PACKING MACHINE.
APPLICATION FILED AUG. 10, 1904.

4 SHEETS—SHEET 1.



WITNESSES:

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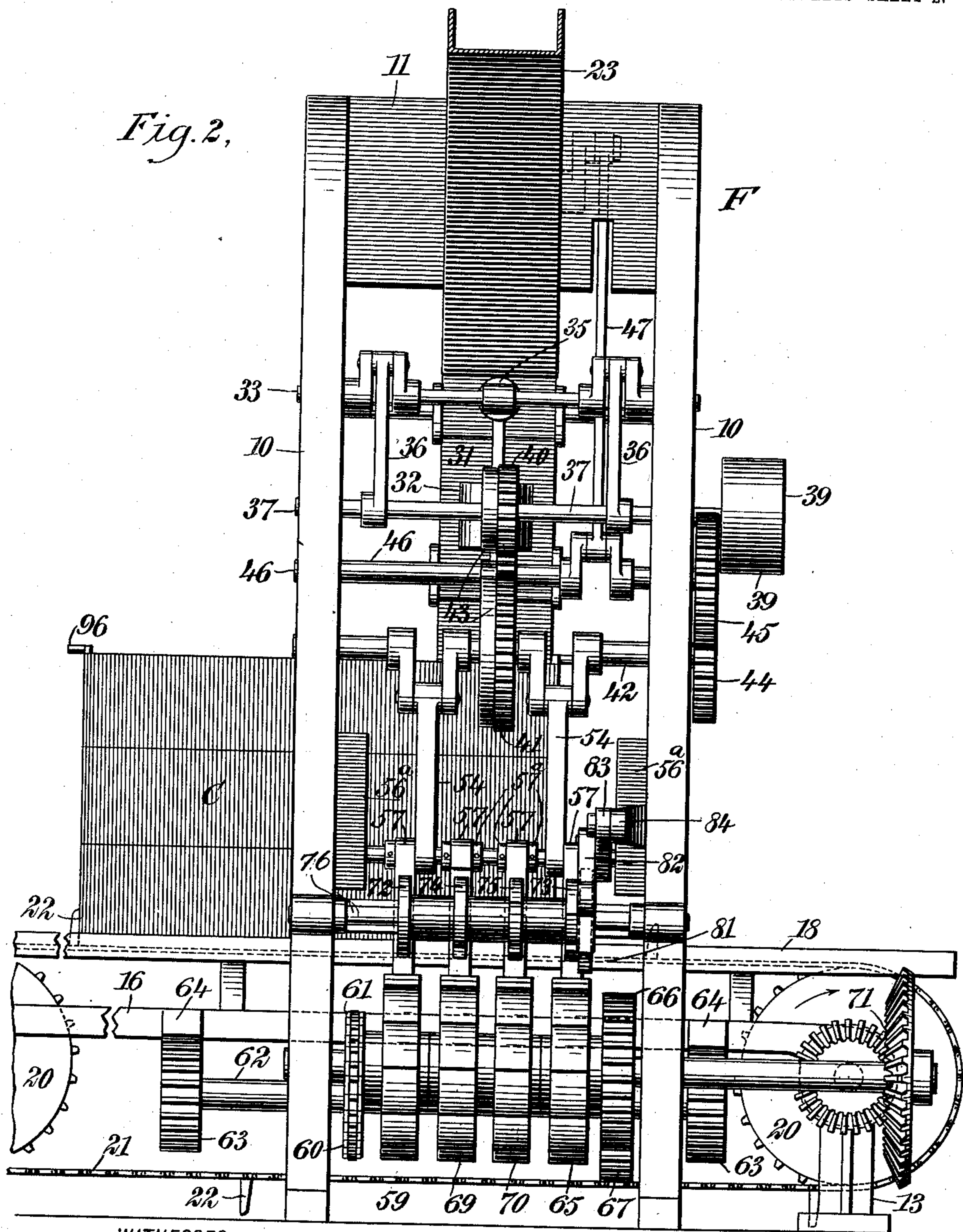
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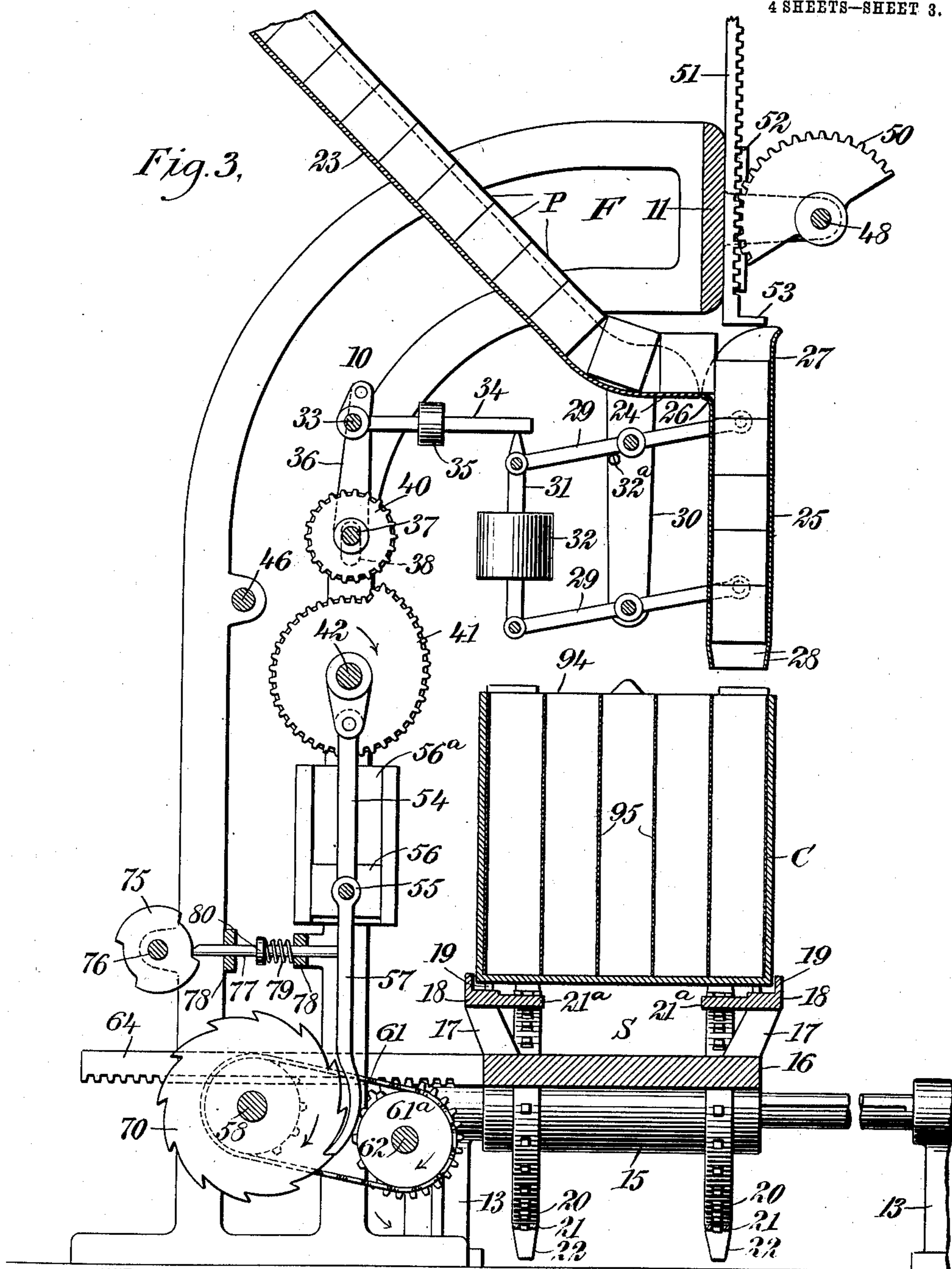
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4 SHEETS—SHEET 3.



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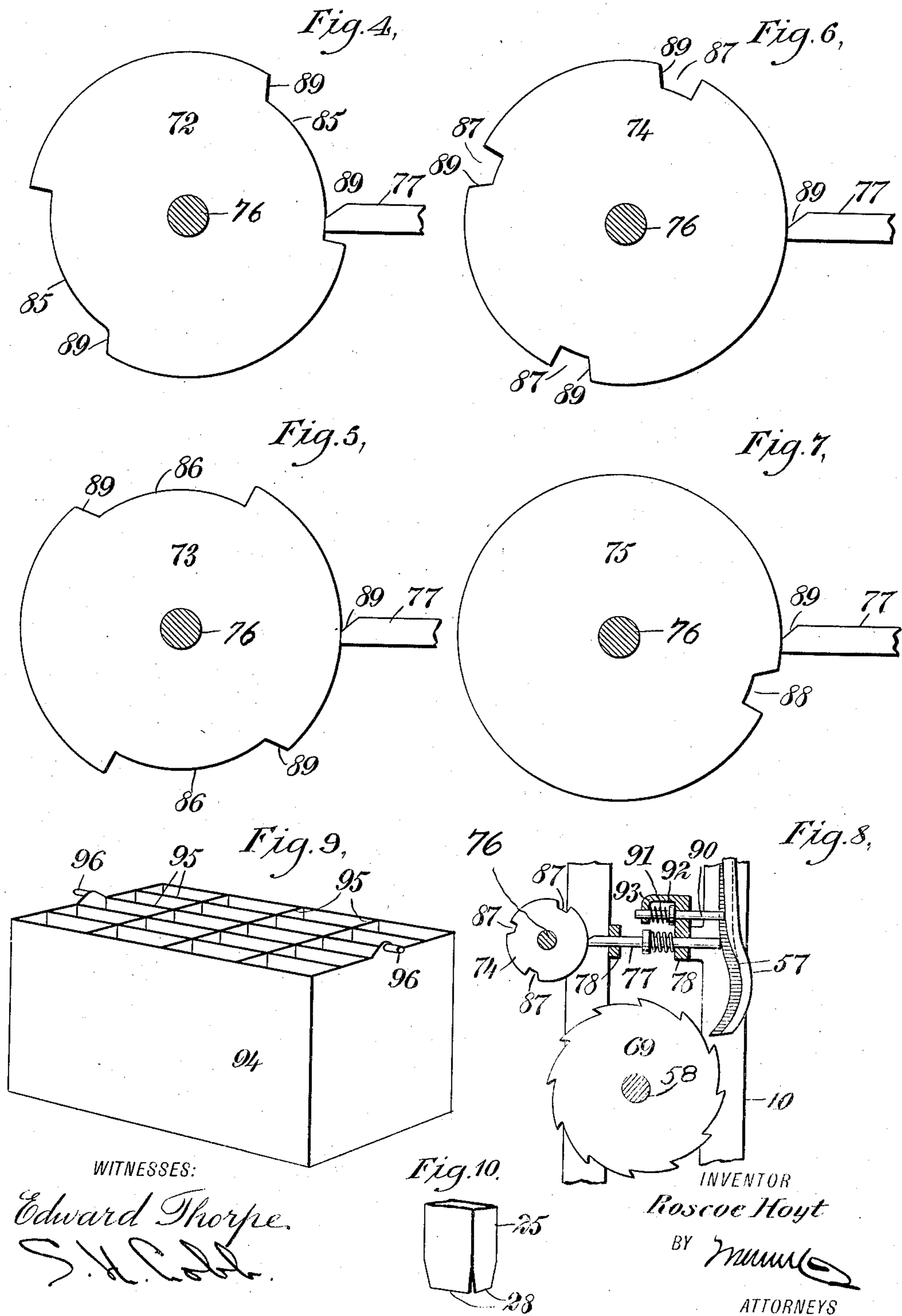
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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

ROSCOE HOYT, OF NEW YORK, N. Y.

PACKING-MACHINE.

No. 859,772.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed August 10, 1904. Serial No. 220,277.

To all whom it may concern:

Be it known that I, ROSCOE HOYT, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Packing-Machine, of which the following is a full, clear, and exact description.

My invention relates to machines for arranging packages in cases, its principal object being to provide an effective apparatus to automatically accomplish this end.

It consists in the various features and combinations hereinafter described and more particularly claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is an end elevation of one embodiment of my invention; Fig. 2 is a broken side elevation thereof, looking from the left in Fig. 1; Fig. 3 is a vertical transverse section therethrough; Figs. 4 to 7 show, diagrammatically, elements of a selective mechanism; Fig. 8 is a sectional detail of the same portion of the machine; Fig. 9 is a perspective view of a guide-frame; and Fig. 10 shows in perspective the end of the delivery-tube.

F designates a frame which may consist of curved or overhanging standards 10, 10 connected at their upper ends by a cross-bar 11. At one side of this frame are pairs of short standards 13, 13, in which are journaled transverse shafts 14. Mounted upon these shafts is a case-support S which may include a sleeve 15 surrounding each of the shafts and movable longitudinally thereof. These sleeves are connected by a platform 16, from the opposite edges of which rise arms 17 connected by angular ways 18, in the horizontal surfaces of which preferably operate rolls 19 which facilitate the movement along the ways of the boxes or cases C, in which the packages are to be packed. Upon each of the shafts 14 is a pair of sprocket-wheels 20, 20 situated in cut-away portions of the sleeves and platform and being splined to the shafts to rotate therewith and yet be capable of longitudinal movement. Over these sprocket-wheels operate feed-chains 21 having transversely-aligned engaging-fingers 22, which are adapted to contact with the rear edges of the cases and move them through the machine. At points between the wheels the chains may be supported to keep their upper run substantially horizontal by arms 21^a projecting from the ways. Various movements are imparted to the case-support, as will be hereinafter described.

At the top of the frame is an inclined supply-conduit or chute 23 which terminates in a substantially horizontal portion 24. Situated in proximity to the end of this chute is a delivery-tube 25 having a somewhat flaring upper end 26, the side 27 of which, opposite the

chute, is extended upwardly to furnish an abutment against which packages P contact as they descend the chute and enter the tube, the latter having such cross-sectional area that said packages fit snugly therein and yet so as not to interfere with their free descent. The packages are temporarily retained in the delivery-tube by divided spring walls 28 situated at the lower extremity, which is located above the case-support. The delivery-tube is mounted upon levers 29, here shown as two in number, which are pivoted to it and fulcrumed upon a depending arm 30. The outer ends of these levers are connected by a link 31 having an upward extension. Upon the link is shown a counterweight 32 serving to hold the upper extremity of the delivery-tube normally in coaction with the supply-chute, its position being determined by some suitable stop, as is indicated at 32^a, fixed upon the arm and contacting with one of the levers.

Journaled in the standards is a crank-shaft 33 having fixed upon it an arm 34 carrying a weight 35, which holds it in contact with the extension of the link 31. The cranks of this shaft have, depending from them, links 36, which have, journaled in their lower ends, a shaft 37 guided by slots 38 in the standards, through one of which it extends, and has fixed upon its outside the frame a pulley 39 to which power may be applied from any suitable source to continuously rotate the shaft during the operation of the machine. Fixed upon the shaft 37 is a gear 40 which may be moved into mesh with an irregular or cam-shaped gear 41 fastened upon a crank-shaft 42 journaled in the standards. Both the gears 40 and 41 are preferably provided upon one face with an annular flange 43. The outer faces of these flanges correspond to the pitch circles of the gears and maintain their teeth in proper relation while they are in mesh.

The shaft 42 has secured upon it a gear 44 which meshes with a gear 45 fixed upon the end of a crank-shaft 46 mounted to rotate in the standards. From the crank of this shaft 46 a link 47 extends to the crank of a shaft 48 journaled in arms 49 extending from the cross-bar 11. The shaft 48 has fast upon it a gear 50 which may be segmental and which coöperates with a rack formed upon a substantially vertical plunger 51 sliding in ways 52 carried by the cross-bar. This plunger is shown as provided with an angular end or head 53 which, upon its downward movement, contacts with the upper package contained in the delivery-tube and forces it before it, the length of the plunger being sufficient to allow the ejection of the entire contents of the tube. At the same time it furnishes a closure for the end of the supply-chute and prevents the discharge of other packages until it has been raised.

The cranks of the shaft 42 are shown as two in number, and upon each operates a link 54, said links having

journaled in their lower extremities a shaft 55 which is guided at its outer ends by cross-heads 56 sliding in ways formed in plates 56^a attached to the standards. Pivoted upon the shaft 55 are operating members or
 5 pawls 57, which may be spaced thereon by collars 57^a at each side. Of these pawls four are here illustrated and each coöperates with a ratchet-wheel mounted upon a shaft 58. One of these wheels, designated by the numeral 59, is loose upon the shaft and has fixed to
 10 it at its outer side a sprocket-wheel 60 which has, passing over it, a chain 61 extending over a similar wheel 61^a upon a shaft 62 rotatable in the standards. At the extremities of this shaft are secured gears 63 which coöperate with racks 64 projecting from the inner side
 15 of the platform. This ratchet-wheel, when rotated by the downward movement of the pawl, acts through the gearing to move the case-support to the right (Fig. 1). The opposite outer ratchet-wheel of the series, numbered 65, is also loose upon the shaft and has fixed to it
 20 a gear 66 meshing with a gear 67 fast upon the shaft 62. It will be evident that the rotation of the gear 67 by its pawl will turn the shaft 62 in the opposite direction from that in which it is rotated by the sprocket-wheels, and thus move the case-support toward the
 25 left. Between the wheels 59 and 65 are ratchet-wheels 69 and 70 which may be fixed to one another and secured to the shaft and which, when moved by their pawls, will rotate, through bevel gearing 71, one of the shafts 14 and thus produce a travel of the feed-chains,
 30 the two wheels operating to move said chains different amounts.

To determine the action of the pawls upon the ratchet-wheels, selective mechanism is provided, which may comprise rotatable contact members or disks 72,
 35 73, 74 and 75, corresponding, respectively, to the pawls of the wheels 59, 65, 69 and 70, these disks being fast upon a shaft 76 journaled in the standards. Coöperating with each of the disks and with its pawl is an intermediate member, which may consist of a pin 77
 40 mounted to slide in cross-pieces 78 extending between the standards and having their outer ends held in contact with the peripheries of the disks by springs 79 which encircle them and contact at their opposite ends with one of the cross-pieces and with enlargements 80
 45 upon the pins. Fastened upon the shaft 76 is a ratchet-wheel 81 with which coöperates a weighted pawl 82 pivoted upon a lever 83 loosely fulcrumed upon an arm 84 projecting from one of the standards. The opposite extremity of this lever is pivotally connected
 50 with the shaft 55, the raising and lowering of this shaft thus resulting in an intermittent rotation of the shaft 76 and its contact-disks. Each of these contact-disks has, in its periphery, recesses which permit a longitudinal movement of the associated pin, allowing its
 55 pawl to fall by gravity into coaction with its ratchet-wheel and to rotate it upon downward movement of the shaft 55. In the disk 72 these recesses 85, 85 are oppositely situated and each extends, in the present instance, for substantially four-twentieths of the circumference. Those in the disk 73, numbered 86, 86, are of
 60 equal extent, but are situated at an angle of 90° from the recesses 85. In the disk 74 are three recesses 87, separated from one another by angles of 90° and each being approximately one-twentieth of the circumference of the disk. They lie in angular relation to the

recesses 85, as is shown in Figs. 4 to 7 of the drawings, coming between and just after or before these with respect to their time of action. The disk 75 has a single recess 88, which is situated equidistantly between the most separated recesses 87 of the disk 74. One side of
 70 each pin and the contacting side of each recess is inclined at 89 to cause the pins to ride out of the recesses in the rotation of the disks. While the recesses 87 and 88 are shown as of the same extent, it is desired that the former shall act for but half the time that do the latter, 75 and to secure this effect a contact member 90 is associated with the pawl of the disk 74, holding it at a different angle than are the companion pawls, so that in its downward movement it will miss the first tooth of the ratchet-wheel with which the companion pawls would
 80 coact, this being particularly illustrated in Fig. 8. Its contact with the succeeding pawl will rotate the ratchet-wheel but half as much. To permit the pawl to follow the ratchet-wheel in its rotation, the contact member 90 is preferably allowed to yield inwardly, it 85 being acted upon by a spring 91 which surrounds it and is situated between an enlargement 92 and a bracket 93 in which the member slides.

In using the machine, the cases to be filled are each supplied with a guide-frame 94 divided by partitions 90
 95 into spaces equaling in number the piles of packages which are to be placed within the box and being similarly arranged. Projections 96 from this frame, situated above the top of the case, enable it to be readily handled. The initial position of the case 95 upon the support, with the chain-fingers in contact with its rear side with respect to the direction in which it is to be moved, is such that the delivery-tube will be above a frame-compartment at the corner of the case. The packages are now allowed to pass down
 100 the supply-chute from any source and are directed into the delivery-tube, the first falling therethrough until its progress is resisted by the spring walls at the end, and those succeeding it resting upon one another. When the number of packages has entered
 105 the tube which will suffice to fill a frame-compartment to the desired depth, their weight overcomes that of the counterweight and the delivery-tube is lowered. This raises the end of the link connecting the supporting-levers into contact with the arm 34. As a result, 110 the cranks of the shaft 33, which are normally just to one side of the vertical center, are moved over this center and the links and shaft 37 supported thereby, descend until the gear 40 comes into engagement with the gear 41. As the former gear is continuously ro- 115 tated, their engagement will result in rotation of the gear 41, this continuing until 40, pressed up by the cam-projection of its companion, is restored to its initial position and passes out of engagement, as is best seen in Fig. 3. Thus for each depression of the delivery- 120 tube a single complete rotation of the shaft 42 results. The first half of this rotation, through the link 47 and the segmental gear 50, moves down the plunger, which presses the packages through the delivery-tube into the compartment of the frame and temporarily holds 125 the packages in the chute from passing into the tube. These form-sections, it will be seen, obviate the possibility of the piles of packages becoming displaced. During this half-rotation or cycle, the pawls 57 are all raised preparatory to making a downward or operating 130

stroke. On the second half of the cycle they descend, and the recess 85 of the disk 72 allows its pin to be pressed from the pawl, bringing it into coaction with the ratchet-wheel 59, all the other pins remaining in contact with the outer peripheries of the disks. In consequence, the shaft 62 is rotated by the sprocket gearing to move the case-support one frame-space to the right by means of the interposed gearing, this bringing the next space of the row beneath the delivery-tube. The operation of delivering a charge of boxes is now automatically repeated and the case advanced a space by its support in the same manner. After there have been four of these movements, the pin rides out of the recess 85 and a companion pin enters a recess 87 of the disk 74. During the second half of this cycle, the ratchet-wheel 69 operates and moves the chain sufficient to advance the case over the ways by one space of the frame, bringing the first of the succeeding row of spaces beneath the delivery-tube, the throw of the ratchet-wheel necessary to secure an advance of one space rather than two being attained by the action of the spring contact member, as has been previously described. Now a recess 86 of the disk 73 comes into action and the case is moved back to the left and the row of frame-spaces filled with packages. These operations continue until the case has been entirely filled. Then, as the advance of a single space would be insufficient to bring a new case under the delivery-tube, the fingers upon the chains are so situated that the first row of the following case shall be separated by two spaces and the recess 88 of the disk 75 acts to cause a complete stroke of the pawl of ratchet-wheel 70, which brings this succeeding case into position to receive the first pile of its contents. In this manner case after case is filled, it being only necessary to supply packages through the chute and place the cases with their guide-frames upon the support. When each has received its contents, the frame is withdrawn and the case is ready for closure.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. A packing-machine comprising a movable delivery device, a case-support, and means for moving the case-support controlled by the movement of the delivery device.
2. A packing-machine comprising a delivery device movable by the packages to be packed, a case-support, and means for moving the case-support controlled by the movement of the delivery device.
3. A packing-machine comprising a movable delivery device, a case-support, and means for moving the case-support in a plurality of directions, said moving means being controlled by the delivery device.
4. A packing-machine comprising a movable delivery device, a case-support, and independent means for moving the case-support for different distances, said moving means being controlled by the delivery device.
5. A packing-machine comprising a case-support, a movable delivery device, and means for effecting the delivery of packages to different portions of the case controlled by the movement of the delivery device.
6. A packing-machine comprising a case-support, a movable delivery device, means for effecting the delivery of packages to different portions of the case controlled by the movement of the delivery device, and ejecting means co-operating with the delivery device.
7. A packing-machine comprising a movable delivery device, a case-support, ejecting means co-operating with the delivery device, and means for moving the case-sup-

port and ejecting means controlled by the movement of the delivery device.

8. A packing-machine comprising a movable delivery device, a case-support, ejecting means co-operating with the delivery device, and means for moving the case-support and ejecting means controlled by the movement of the delivery device.

9. A packing-machine comprising a delivery device, a case-support, power mechanism, independent operating means for imparting a plurality of movements to the case-support, and selective mechanism for determining the connection of the operating means with the power mechanism.

10. The combination with a case-support, of a delivery-tube movable independently of the case-support having its side-walls divided to furnish spring retaining members.

11. The combination with a case-support, of a delivery-tube movable toward and from the case-support having its side-walls divided at one end to furnish spring-retaining members, and a plunger movable into the opposite end of the delivery-tube.

12. The combination with a supply-chute and a case-support, of a delivery-tube movable toward and from the case-support having its side-walls divided at one end to furnish spring-retaining members, and a plunger movable into the opposite end of the delivery-tube and operating across the supply-chute.

13. The combination with a movable case-support, of a movable delivery device, a lever connected to the delivery device, and power mechanism for moving the case-support connected with the lever.

14. The combination with a movable case-support, of a delivery device, a continuously-rotatable gear movable by the delivery device, a cam-shaped gear with which said continuously-rotatable gear coacts, and means for communicating the movement of the cam-shaped gear to the case-support.

15. The combination with a movable case-support, of a series of pawls, ratchet-wheels connected with the case-support and with which the pawls may coact, and means for determining the engagement of the pawls and ratchet-wheels.

16. The combination with a movable delivery device, of a movable case-support, a series of pawls, ratchet-wheels connected with the case-support and with which the pawls may coact, and means for determining the engagement of the pawls and ratchet-wheels operable by the delivery device.

17. The combination with a movable case-support, of a series of pawls, ratchet-wheels connected with the case-support and with which the pawls may coact, means for determining the engagement of the pawls and ratchet-wheels comprising rotatable contact members, and intermediate members coacting with the contact members and with the pawls.

18. The combination with a movable case-support, of a series of pawls, ratchet-wheels connected with the case-support and with which the pawls may coact, means for determining the engagement of the pawls and ratchet-wheels and means for varying the relation of one of the pawls to its ratchet-wheel.

19. The combination with a case-support comprising ways and feed-chains, of independent means for moving the ways and the feed-chains.

20. The combination with shafts, of a case-support movable along the shafts and comprising feed-chains connected with said shafts, and means for rotating the shafts and reciprocating the case-support thereon.

21. The combination with shafts, of a case-support movable along the shafts and comprising feed-chains connected with said shafts, and independent means for moving the feed-chains by different amounts.

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

ROSCOE HOYT.

Witnesses:

SYLVANUS H. COBB,
JNO. M. RITTER.