

(No Model.)

8 Sheets—Sheet 1.

W. E. NICKERSON.
APPARATUS FOR FILLING PACKAGES.

No. 588,168.

Patented Aug. 17, 1897.

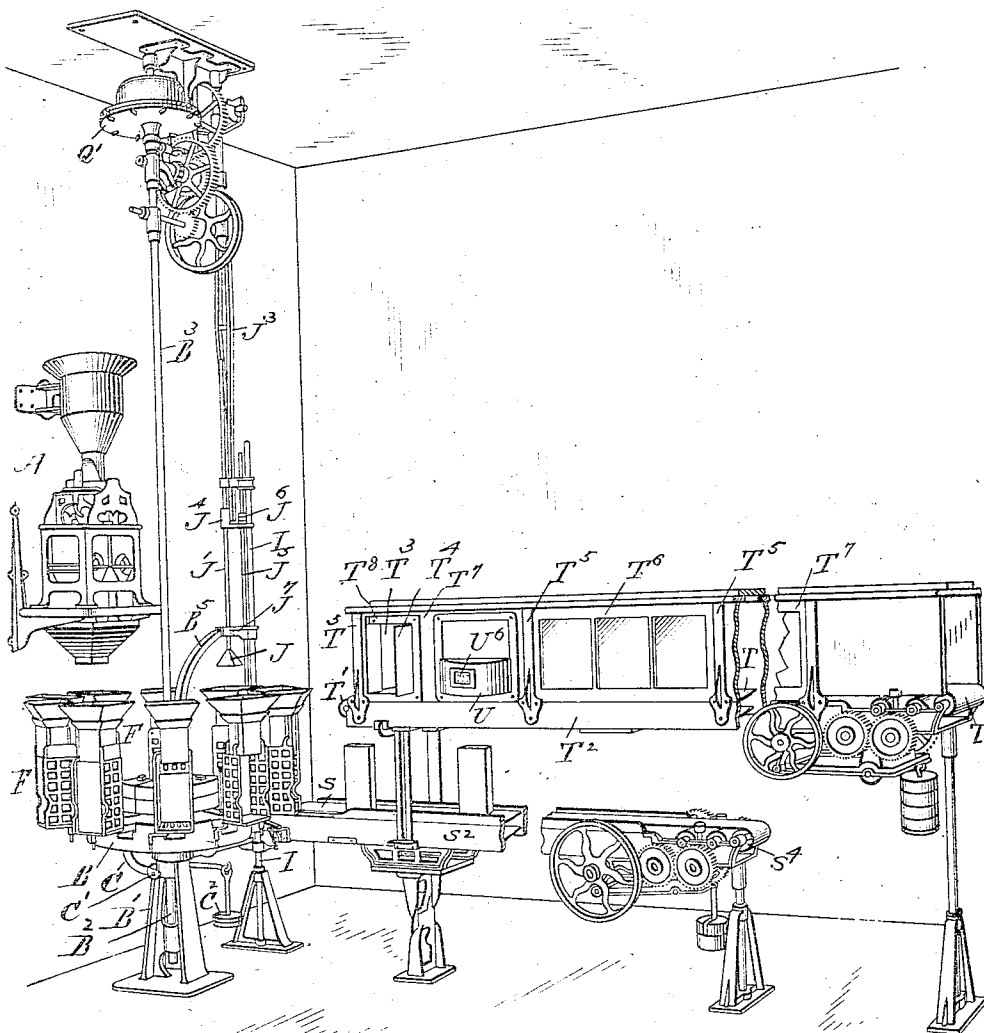


FIG. 1.

WITNESSES:

Frank G. Parker

William H. Parry

INVENTOR

William Emory Nickerson

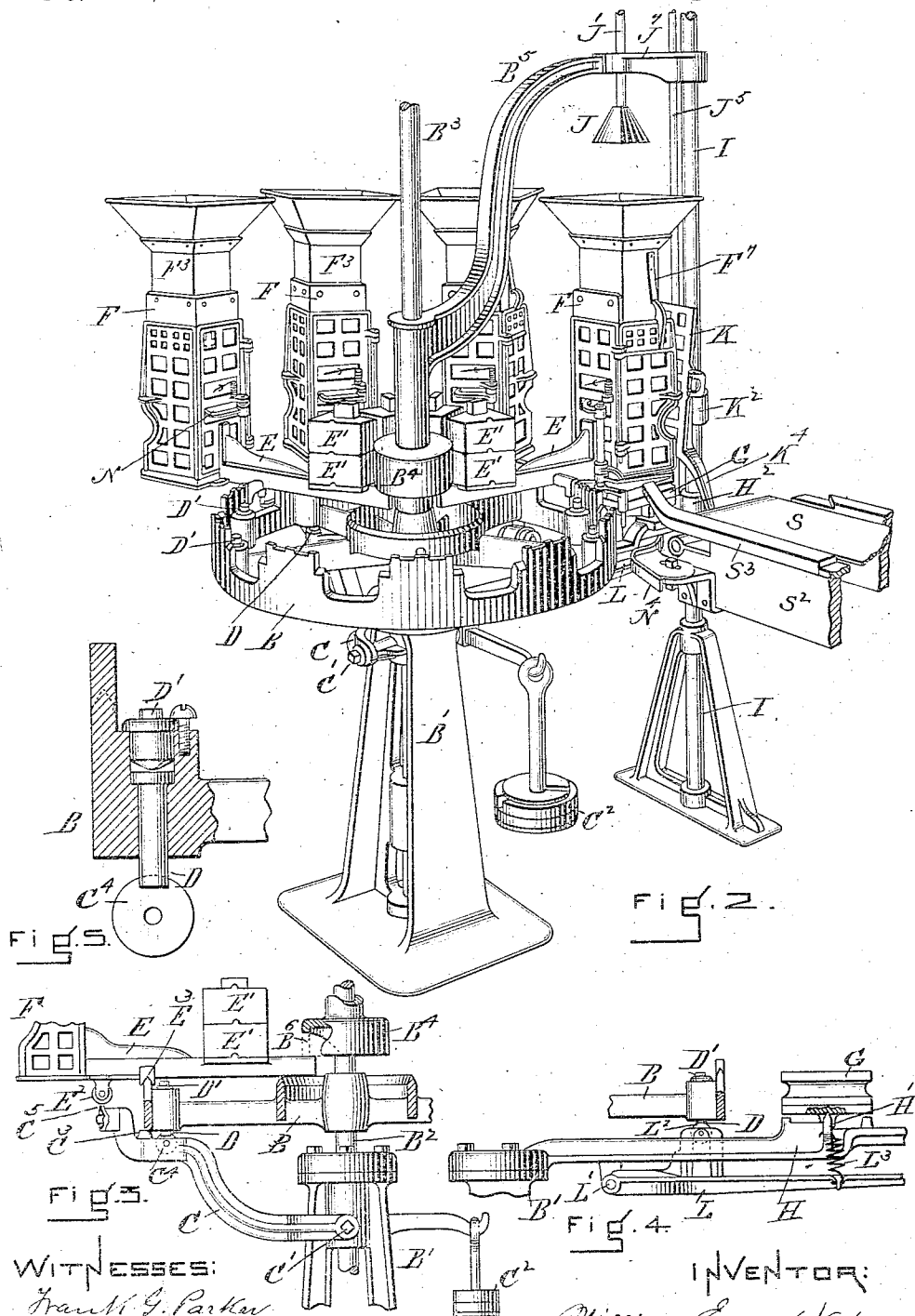
(No Model.)

8 Sheets—Sheet 2.

W. E. NICKERSON.
APPARATUS FOR FILLING PACKAGES.

No. 588,168.

Patented Aug. 17, 1897.



WITNESSES:

Frank G. Parker

William A. Parry

INVENTOR:

William Emory Nickerson

(No Model.)

8 Sheets—Sheet 3.

W. E. NICKERSON.

APPARATUS FOR FILLING PACKAGES.

No. 588,168.

Patented Aug. 17, 1897.

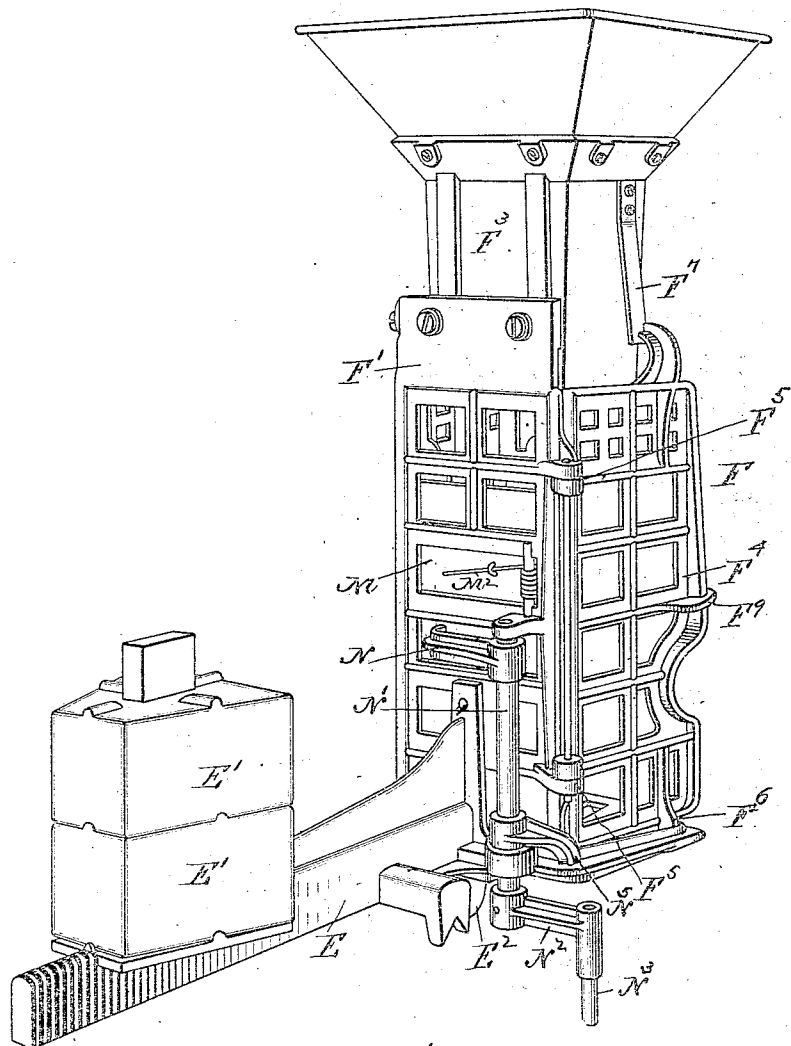


Fig. 6.

WITNESSES:

Frank G. Parker

William A. Perry.

INVENTOR:

William Emery Nickerson

(No Model.)

8 Sheets—Sheet 5.

W. E. NICKERSON.
APPARATUS FOR FILLING PACKAGES.

No. 588,168.

Patented Aug. 17, 1897.

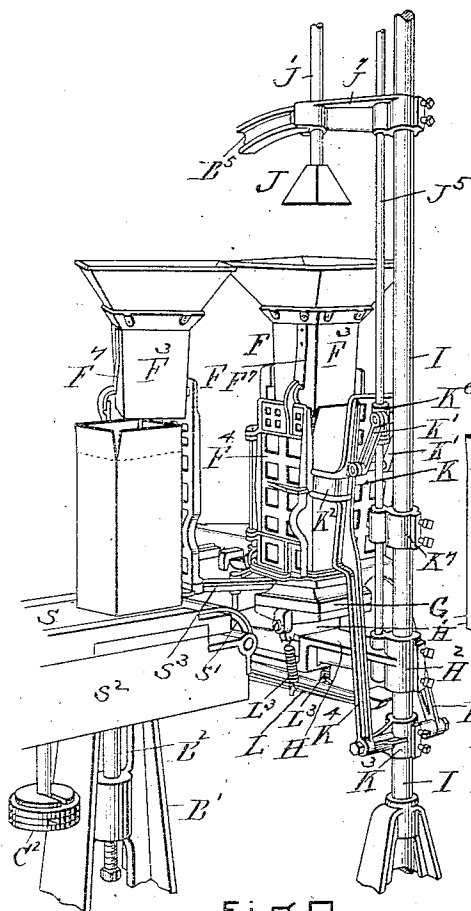


Fig. 9.

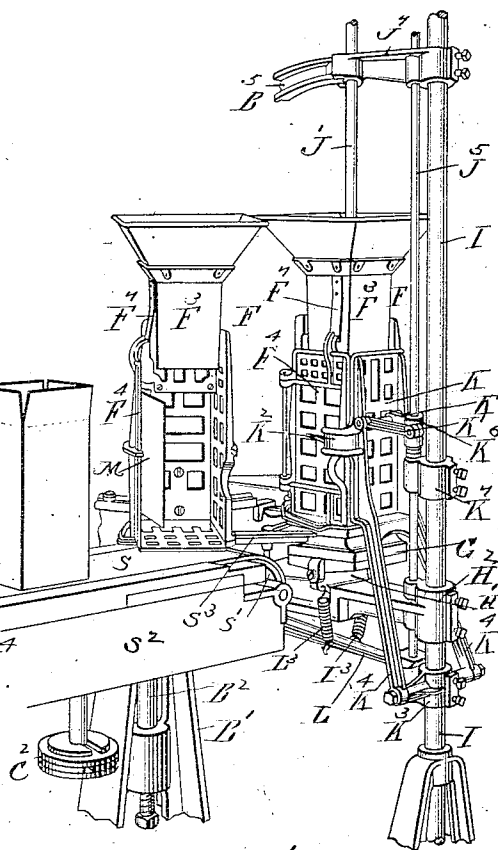


Fig. 10.

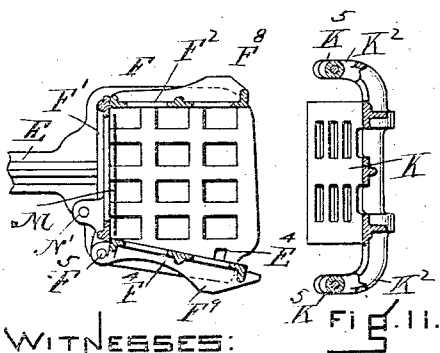


Fig. 11.

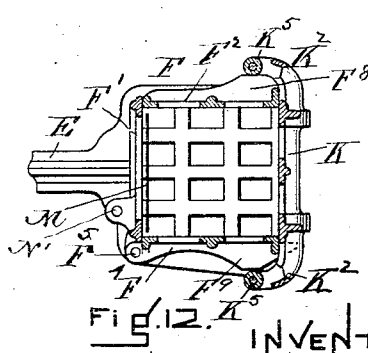


Fig. 12.

WITNESSES:

Frederick G. Parker

William H. Parry.

INVENTOR:

William Emory Nickerson

(No Model.)

8 Sheets—Sheet 6.

W. E. NICKERSON.
APPARATUS FOR FILLING PACKAGES.

No. 588,168.

Patented Aug. 17, 1897.

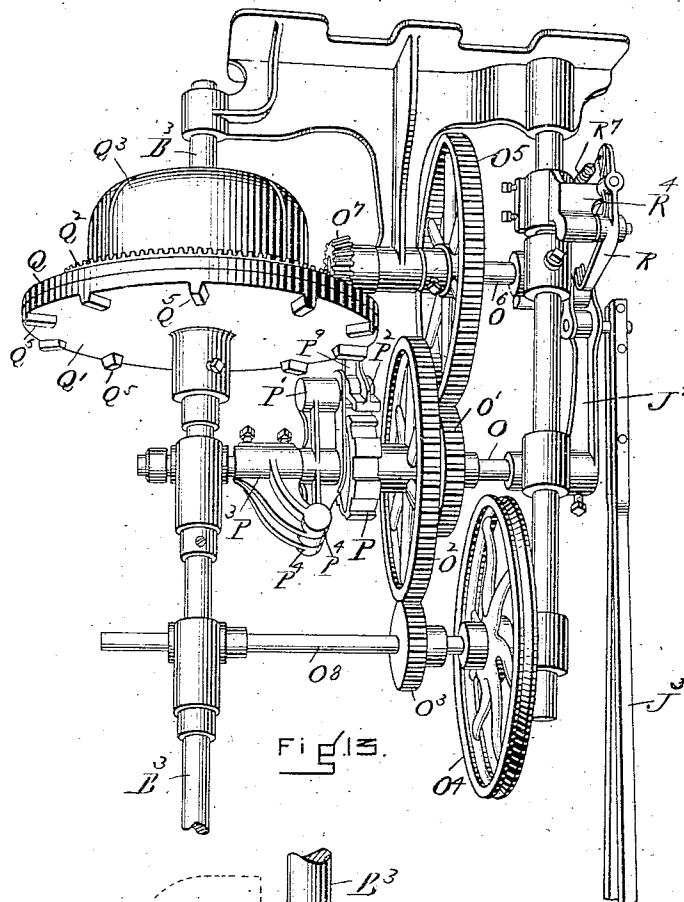


FIG. 13.

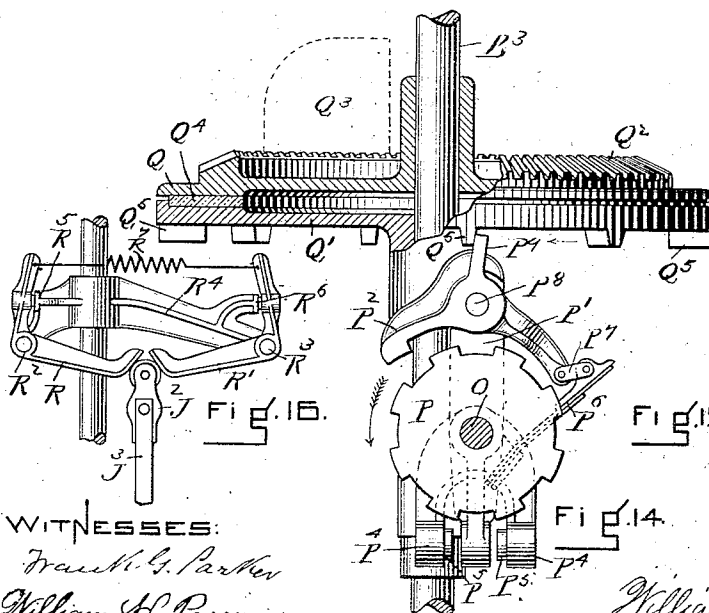
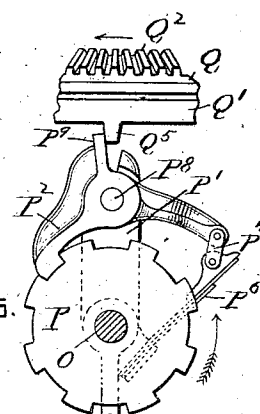


FIG. 14.



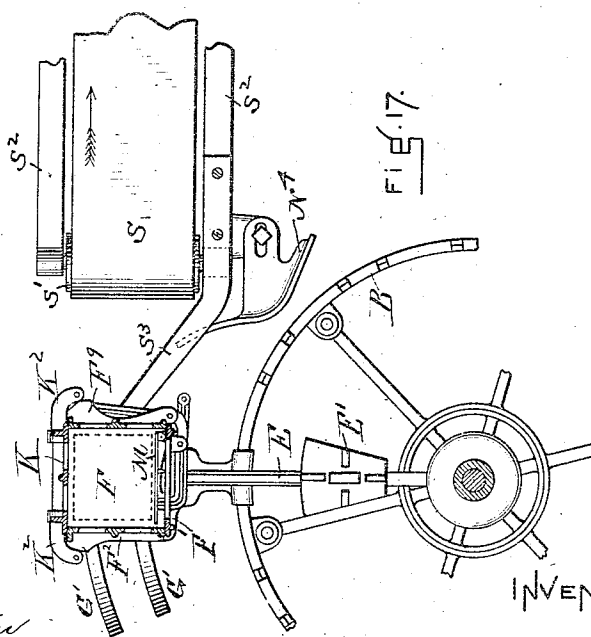
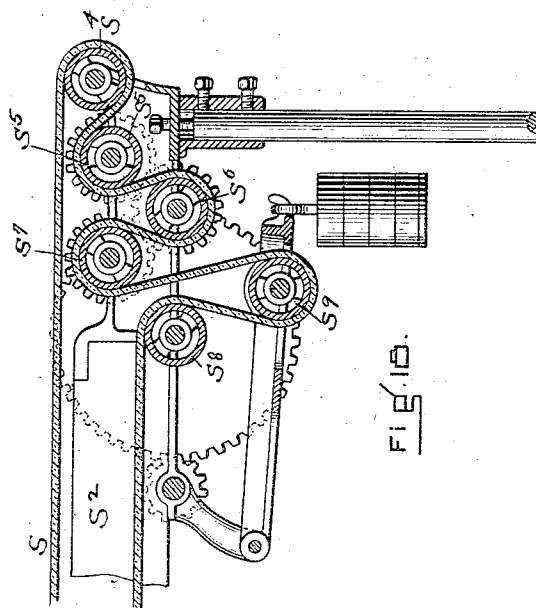
(No Model.)

8 Sheets—Sheet 7.

W. E. NICKERSON.
APPARATUS FOR FILLING PACKAGES.

No. 588,168.

Patented Aug. 17, 1897.



WITNESSES
Frank G. Parker
William H. Parry

INVENTOR:
William Emory Nickerson

W. E. NICKERSON.
APPARATUS FOR FILLING PACKAGES.

No. 588,168.

Patented Aug. 17, 1897.

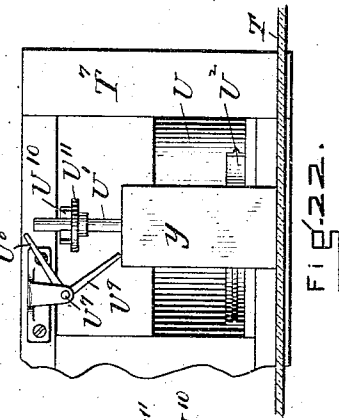
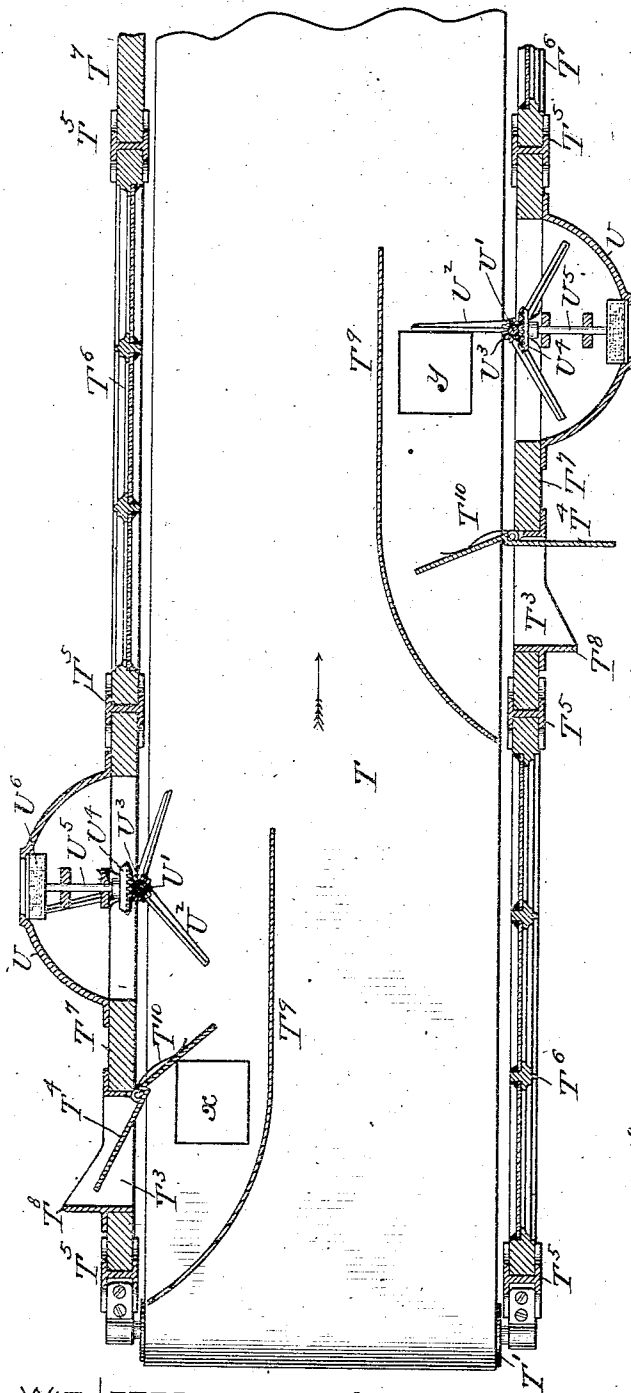


FIG. 22.

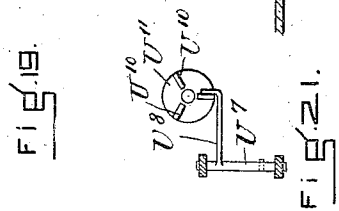


FIG. 21.

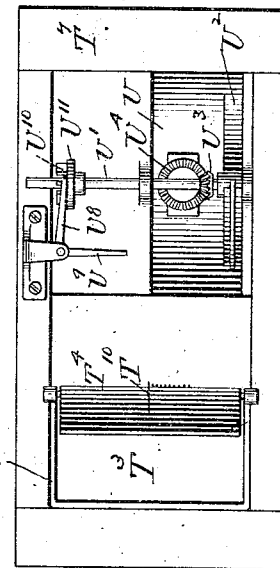


FIG. 20.

WITNESSES.

Frank G. Parker
William S. Perry.

INVENTOR:

William Emory Nickerson

UNITED STATES PATENT OFFICE.

WILLIAM EMERY NICKERSON, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR
TO THE NEW ENGLAND WEIGHING MACHINE COMPANY, OF BOSTON,
MASSACHUSETTS.

APPARATUS FOR FILLING PACKAGES.

SPECIFICATION forming part of Letters Patent No. 588,168, dated August 17, 1897.

Application filed February 11, 1897. Serial No. 622,994. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EMERY NICKERSON, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Apparatus for Filling Packages, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to apparatus to be used in filling, transporting, and registering packages and for compressing the material therein. It is especially adapted to operate in connection with automatic weighing-machines.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a general view in perspective of my apparatus and includes, essentially, a rotating table having balanced arms bearing package-holding cages, said table having also latch devices and a vertical driving-shaft; also, mechanism attached to the ceiling, consisting of friction-disks for driving the table, a clutch device for operating a compressing-plunger, and related parts; further, a receiving-apron, with its supporting-framework and driving-gear, adapted to receive filled and compressed packages from the cages of the rotating table, and, lastly, an inclosed removing-apron, with its framework, driving-gear, inclosing case, doorways, and registering devices. A weighing-machine of an ordinary type is also included to show its relation to the rotating table. Fig. 2 is a view in perspective of a rotating table having balanced arms, a number of which are removed in order to more fully disclose the construction. Fig. 3 is a view in elevation of the principal table-holding latch, parts of the table and of its pedestal and a balanced arm being included to show the relation of the latch thereto. Fig. 4 is an elevation of a secondary table-holding latch and related parts. Fig. 5 is a view enlarged, partly in section and partly in elevation, of a part of the rim of the table, showing one of the contact-pins adapted to engage with the table-latches and also a latch-roller. Fig. 6 is a perspective view, enlarged, of one of the balanced arms and package-holding cages and shows portions of a device

for expelling the filled packages from the cage. Fig. 7 is also a perspective view of a balanced arm and package-holding cage, but from a different point of view. Fig. 8 is a view in horizontal section cut across on the line xx of Fig. 7. Fig. 9 is a perspective view of two package-holding cages, a compressing-plunger, and a cage-closing door, the latter being in the open position; also, the end of a traveling apron upon which the filled packages are expelled from the cages. Fig. 10 is a view similar to Fig. 9, excepting that the cage-closing door is in the closed position and the compressing-plunger downward within the cage. Fig. 11 is a slightly-enlarged view, partly in plan and partly in horizontal section, showing the relation of the package-holding cage and a door, the latter being in the open position. Fig. 12 is similar to Fig. 11, excepting that the door is in the closed position. Fig. 13 is a perspective view of mechanism consisting of a pair of friction-disks for driving the table, a continuously-rotating clutch-wheel with a clutch-latch and crank for operating the compressing-plunger, and other related parts. Fig. 14 is a view, partly in side elevation and partly in vertical section, of the friction-disks for driving the table and of a clutch mechanism for operating the compressing-plunger, showing the relation of the parts, the clutch being out of engagement. Fig. 15 is an elevation of the clutch shown in Fig. 14, but in the engaged or operative position. Fig. 16 is a side elevation showing centering-stops adapted to exactly locate the compressor-crank after each of its movements. Fig. 17 is a view in plan of a portion of the rotating table from which all the balanced arms have been removed excepting the one which is in position under the compressing-plunger, and also showing the end of the receiving-apron and the contour-piece used in connection with mechanism on the cages for expelling the filled packages. Fig. 18 is a view, mostly in vertical section, disclosing the manner of driving and tightening the aprons. Fig. 19 is a view, partly in plan and partly in horizontal section, showing a removing-apron with portions of its inclosing case and also entrance doorways and doors.

and registering devices. Fig. 20 is an elevation of a registering mechanism and locking device as seen from within the casing of the removing-apron. Fig. 21 is a plan of the locking device used in connection with the registering mechanism. Fig. 22 is a view in elevation of the registering mechanism and is similar to Fig. 20, excepting that a package is passing by it.

10 My improved apparatus has for a basis a rotating table which is suitably mounted upon a pedestal and is provided with a latch which prevents its rotation except at proper intervals, as hereinafter described. This table has a series of balanced arms pivoted upon its edge or rim, each arm carrying upon its outer end a package-holding cage having a funnel at its top, the cage being counter-balanced by weights at the inner end of the arm. The table is driven by a vertical shaft extending to the ceiling and carrying near its top a set of friction-plates, one of which is continuously rotated, whereby the table is turned when not held in check by its latch. 20 The aforesaid cages pass successively under the discharge-aperture of the weighing-machine as the table rotates, the latch of the table causing each cage in turn to stop directly beneath the aforesaid discharge-aperture. 30

Upon a discharge of the weighing-machine into the cage located beneath it the balanced arm corresponding thereto is depressed at its outer end, causing, by suitable mechanism, 35 the tripping of the table-latch and consequent movement of the table, bringing the next cage in succession underneath the discharge-aperture of the weighing-machine. When a cage has advanced the proper distance beyond the discharge-orifice of the weighing-machine, it is found to rest upon a platen and to be opposite an automatic door, the latter working in connection with a compressing-plunger, whereby the open side of the cage is closed while the material in the package within it is being compressed to the proper bulk by the plunger. Both the automatic door and compressing-plunger are operated by a crank connected with a clutch mechanism, the latter being thrown in and 50 out of engagement by means of projections attached to that one of the pair of friction-plates which is in rigid connection with the table. When by the rotation of the table the cage which was under the compressing-plunger makes its next movement in succession, it is brought over a moving receiving-apron; and during the movement the package in the cage is expelled therefrom and set upon the apron by means of an expelling mechanism located at the back of the cage and which will be hereinafter fully described. 60

When the filled packages have been placed upon the receiving-apron, (which may be of any desired length, but preferably of such that a number of labelers or other operatives may sit along the sides sufficient to handle

the packages which the table delivers,) they move along in front of the labelers, who are preferably seated at narrow benches attached 70 to sides of the frame supporting the apron. These benches are not represented in the drawings, as they would obscure the other parts. When the packages have been labeled or otherwise sealed up, they are placed 75 upon a removing-apron, which is inclosed within a casing, the packages being introduced through doorways in the sides, and are made to pass through registering devices, so that the number of packages handled by each 80 operative is duly recorded. This removing-apron is adapted to convey the packages through drying-rooms or otherwise to such places as may be devoted to putting them into boxes or other operations. 85

My apparatus, as herein illustrated and described, is expressly adapted to handle pasteboard cartons or boxes, sometimes called "shells," such as are used for holding small uniform weights of prepared cereals, starch, 90 washing-powders, or other articles of commerce. By suitable modification of the cages, however, various styles of packages may be handled. I shall therefore use the word "carton" as standing for any sort of receptacle 95 which might be used for the purpose.

I will now proceed to describe the various parts of my apparatus in detail.

In the drawings, A, Fig. 1, represents an automatic weighing-machine of any suitable 100 type, adapted to successively deliver charges of uniform weight. As the construction of this machine is not involved in the following specification and claims, it is not necessary to further describe it. 105

A rotating table, which is designated by B and which may be seen in whole or in part in Figs. 1, 2, 3, 4, 5, and 17, is mounted upon its pedestal B' by means of the vertical shaft B². The movements of the table are controlled by the latch C, which is shown in Figs. 1, 2, and 3 and is pivoted upon the pedestal B' by two bolts, one of which is shown at C'. The latch C is counterbalanced by the weight C² and thereby kept normally in contact near 115 its outer end C³ with the rim of the table B, Fig. 3.

The table B is provided on the inner side of its rim with stop-pins D D, one of which is shown enlarged in Fig. 5. These pins D D 120 are adapted to engage successively on their cylindrical sides, at their lower ends, with the flat end of the roller C⁴, mounted on the latch C, and thereby to stop, unless otherwise influenced, the rotation of the table B, 125 Fig. 3. The pins D D, Fig. 5, are so mounted in their sockets as to be free to turn by the jar of ordinary use, whereby they present continuously new surface of contact to the end of the roller C⁴, and thus prolong their 130 period of wear. They are held from rising in their sockets by the plugs D' D', Fig. 5. The balanced arms E E, which are pivoted upon the rim of the table B, as shown at E³,

Fig. 3, carry on their outer and broadened ends the cages F F and upon their inner ends the counterweights E E, Figs. 1, 2, 3, 6, 7, and 17. The counterweights E E are made sufficiently heavy to hold down the inner ends of their respective arms E E when the corresponding cages F F are empty or contain only empty cartons, but to allow the outer or cage-bearing ends of the arms to descend whenever a load has been discharged into the carton in the respective cages. The stop-pins D D, which are equal to the arms E E in number, are so arranged on the table B as to stop the rotation of the table whenever a cage containing an empty carton comes under the discharge-orifice of the weighing-machine, Fig. 3. Each of the arms E E is provided with a small roller or wheel upon its under side and near its outer end, of which one is shown at E², Fig. 3. These small rollers E² are adapted, upon a depression of the cage-bearing ends of the arms E E, to come in contact with the outer end C⁵ of the table-latch C and force it downward, thereby disengaging the roller C⁴ from the respective stop-pin D, thus allowing the table B to rotate until the succeeding cage comes beneath the discharge-aperture of the weighing-machine, whereupon the succeeding stop-pin engages with the latch-roller C⁴ and the table is again brought to rest.

The cages F F are constructed in the following manner, Figs. 6, 7, and 8: The back side F¹ of the cage, or that which is toward the center of the table, is rigidly attached to its corresponding arm E. The side F², Figs. 7 and 8, is also rigidly attached to the arm E, and at the same time to the side F³, and upon both the sides F¹ and F², at the top, is securely mounted the funnel F³, its bottom end, Fig. 8, being slightly set away from the sides F¹ and F², in order to allow the upper ends of the flaps of the cartons to project a little between it and the sides of the cage. Another side of the cage F⁴, Figs. 6, 7, and 8, is hinged to the side F¹ at F⁵ F⁵ and is free to swing outward a short distance in order to allow easy introduction and expulsion of the carton. The outward movement of the side F⁴ is limited by a stop-piece F⁶, which projects downward into an elongated slot in the flattened end of the arm E. This slot is partially shown in plan in Fig. 11 and designated by E⁴. For convenience in introducing the carton the side of the cage F⁴ is held normally open by the light spring F⁷ attached to the funnel F³.

When a cage containing a filled carton has moved into the second position beyond that under the weighing-machine, it is brought over the pivoted platen G, Figs. 2, 4, 9, and 10, being in the meantime raised from its depressed position by the upwardly-slanting arms G' G', which are attached to the platen G and are visible in plan in Fig. 17 only. The platen G is pivoted upon the edge of a transverse extension H' Fig. 4 of the horizontal

arm II, said arm extending from the top of the pedestal B' to the vertical supporting-rod I, being attached to the latter by means of the hub H² and suitable set-screws, Figs. 2, 4, 9, and 10. The platen G is pivoted as shown in order that it may conform to the flattened parts of the arms E E, which form the bottoms of the cages F F. The platen G is adapted to support each cage in turn during the compressing of the material in the carton held by the cage.

J is a compressing-plunger attached to the plunger-rod J', the latter being connected with the compressor-crank J² by means of the connecting-rod J³ and guiding-bar J⁴, Figs. 1, 13, and 16, and also 2, 9, and 10. A rotation of the crank J² causes the plunger J to enter the carton which is within the cage which is located over the platen, Fig. 10, and press down the material therein. The guiding-bar J⁴, Fig. 1, when the crank J² and plunger J are in their upper or normally stationary position, supports the vertically-movable rod J⁵ by means of the rigidly-attached collar J⁶, Fig. 1. As soon as the plunger descends a short distance, allowing thereby the rod J⁵ to also descend, the door K, which is actuated by the said rod J⁵, is closed against the cage which is over the platen G.

The door K supports the carton while the material within it is being compressed, Figs. 2, 9, 10, 11, 12, and 17. The rod J⁵ is connected with the door K by means of links K¹ K¹ and hub K⁶, Figs. 9 and 10, in such a way that when the rod J⁵ and guiding-bar J⁴ are in their highest position the door K is held open or away from the cage, as in Fig. 9; but when the rod J⁵ is allowed to descend to the limit of its movement—viz., until the hub K⁶ rests on the support K⁷—the door K is pressed against the cage, closing the latter, as in Fig. 10, the embracing arms K² K² holding the cage securely and causing the movable side F⁴ to close upon the carton, as shown in Figs. 10, 12, and 17. The rod J⁵ slips loosely through the guiding-bar J⁴, Fig. 1, and only descends a short distance in closing the door K. After the rod J⁵ has descended to the limit of its movement, which is regulated by the hub K⁶ and support K⁷, Figs. 9 and 10, the guiding-bar J⁴ and attached parts continue to descend to the full stroke of the plunger J. The rod J⁵ is again lifted up and the door K thereby opened by the guiding-bar J⁴ acting on the collar J⁶, Fig. 1, when near the upper end of the return or upward stroke. The door K is pivoted by means of the arms K⁴ K⁴, Figs. 9 and 10, upon the supporting-piece K³, attached to the vertical supporting-rod I. The embracing arms K² K² of the door K are preferably provided with the friction-rollers K⁵ K⁵, Figs. 11 and 12, which act upon the contour-piece F⁸ of the side F² and the contour-piece F⁹ of the movable side F⁴ of the cage F in closing the latter.

Beside the primary latch C the table B is provided with a secondary latch L, which

acts in connection with the same stop-pins D D as the latch C, Figs. 4, 9, and 10. The latch L is pivoted to the horizontal arm H, Fig. 4, at L', and is provided, like the latch C, with a contact-roller L², and is maintained normally in engagement with a stop-pin D by the springs L³ L³, Figs. 4, 9, and 10. The outer end of the latch L is located beneath the lower end of the vertically-movable rod J⁵, which operates the door K and slides loosely through the arm H. When the rod J⁵ descends to its lowest position, Fig. 10, its lower end comes in contact with the outer end of the latch L and depresses the latter, forcing its contact-roller L² out of engagement with the respective stop-pin D of the table B. The function of the latch L is to check the movement of the table independently of the latch C and prevent the embarrassment of the plunger J and connected parts in case the latch C should fail for some reason to properly stop the table.

The latch L is so adjusted with regard to the latch C that the table upon a movement is stopped first by the latch L, but only slightly before it would otherwise have been stopped by the latch C. Then upon a descent of the plunger J and consequent descent of the rod J⁵ the latch L is tripped or forced out of engagement, as shown, and the table slightly advances and comes to rest against the latch C. The latch L, however, is not tripped in these movements until the plunger J has begun to enter the cage and the latter has become gripped by the embracing arms K² K² of the door K, whereby the plunger J is prevented from descending otherwise than in the cage. It will be seen from the above description that the function of the latch L is precautionary only, and that while its use is desirable it is not indispensable to the full operation of the apparatus. The roller C⁴ of the primary latch C and the roller L² of the secondary latch L are not used as rollers in the ordinary meaning, as their contact with the stop-pins D D is made on their flat ends and not on their cylindrical sides. They are used because their gradual rotation when in use continuously presents fresh surfaces of contact to the stop-pins D D, and their ends may be reversed when one is worn.

Each of the cages F F is provided with an expelling-door M, Figs. 6, 7, 8, 10, 11, 12, and 17, located at the back of the cage, on its inner side, and hinged on one of its vertical edges to the back F' of the cage, as shown at M', Fig. 8. This door M is adapted by swinging upon its hinges to push out the filled and compressed packages when the cage has come into the proper position. Movement is given to the door M by means of the swinging arm N, vertical shaft N', arm N², and pin N³, Figs. 6, 7, and 8, operating in connection with the contour-piece N⁴, mounted upon a support external to the table, in this case the apron-frame, Figs. 2 and 17. The short arm N⁵, attached to the vertical shaft N', acts as a back-

stop to prevent the shaft N' and attached parts from moving too far backward. After expelling a package the door M is returned to its normal position by means of the spring M², Figs. 6 and 8.

Motion is given to the compressor-crank J², Fig. 13, by means of the shaft O, upon which are loosely mounted the gear O', the gear O², and the clutch-wheel P, the two gears mentioned and the clutch-wheel P, however, being firmly connected to each other, while free to run together on the shaft O. Continuous motion is imparted to the gears O' and O² and the clutch-wheel P by the gear O³, which meshes into the gear O² and is driven by the shaft O⁴ and the pulley O⁴. The gear O' drives the gear O⁵, which through the shaft O⁶ and beveled pinion O⁷ causes the friction-plate Q, provided with the circular beveled rack Q² and weights Q³, to continuously rotate about the vertical shaft B³ of the table B. The continuously-rotating friction-plate Q rests upon the friction-plate Q', which is firmly attached to the vertical shaft B³. Between the friction-plates Q and Q' (see Fig. 14) is a washer Q¹, of wood or other suitable substance.

Mounted upon the shaft O, Fig. 13, but not rigidly attached to it, is an arm P', carrying the clutch-latch P², the latter being adapted to engage with the continuously-rotating clutch-wheel P, Figs. 13, 14, and 15. The arm P' causes the shaft O to rotate whenever the clutch-latch P² is in engagement with the clutch-wheel P by means of the piece P³, which is rigidly attached to the shaft O, its bifurcated parts P⁴ P⁴ embracing one end of the arm P'. The parts P⁴ P⁴ of the piece P³ are provided with elastic pads P⁵ P⁵, of rubber or other suitable substance, Fig. 14, which relieve the shock caused by the operation of the clutch mechanism. The clutch-latch P² is provided, Figs. 14 and 15, with a flat spring P⁶ and the connecting-links P⁷ P⁷, which serve the purpose of maintaining the clutch-latch either in or out of engagement, according as it has passed the critical or dead point of pressure of the spring P⁶ and links P⁷ P⁷. Fig. 14 shows the clutch-latch out of engagement, and Fig. 15 in engagement, with the continuously-rotating wheel P. The clutch-latch P² swings upon a pivot P⁸, inserted in the arm P'. The clutch-latch P² is further provided with a short arm P⁹, which serves to throw the latch in and out of engagement by contact with the projections Q⁵ Q⁵, located upon the lower friction-plate Q', the latter always turning with the table B. These projections Q⁵ Q⁵ are so located with reference to the clutch-latch P² and balanced arms E E of the table B that whenever the table moves in bringing a fresh cage under the compressor-plunger one of these projections comes in contact with the arm P⁹ of the clutch-latch just before the movement of the table is stopped by the table-latch. This throws the clutch-latch P² into engagement with the continu-

ously-rotating clutch-wheel P, as shown in Fig. 15. This causes the clutch-latch P², with the arm P' and bifurcated piece P³, and in consequence the shaft O and compressor-crank J², to make a rotation until the arm P⁹ of the clutch-latch P² again comes in contact at the end of the rotation with the same projection Q⁵ which forced the latch into engagement, but on the other side of the projection and of the arm P⁹, forcing the clutch-latch P² out of engagement with the continuously-rotating clutch-wheel P and bringing the latch mechanism, shaft O, and compressor-crank J² to a stop in the position from which it started. During this movement the compressor-shank J² has caused the plunger J to descend and rise again, compressing the material in the carton underneath it, and the door K to move forward and close the cage and then to open again on the upward movement of the plunger.

The crank J², Fig. 16, is exactly centered and normally held at rest in its upper position by the movable stop-pieces R R', pivoted at R² and R³, respectively, to the fixed supporting-piece R⁴ and held in position against the respective stops R³ and R⁶ by the spring R⁷.

The exact centering of the compressor-crank J² in its position of rest is important, in order that the arm P⁹ of the clutch-latch P² may always occupy a definite place between each movement in regard to the projections Q⁵ Q⁶ on the friction-plate Q¹.

Loosely mounted on the vertical driving-shaft B³ of the table B, Figs. 2 and 3, is the stop-piece B⁴, which projects over the inner ends of the balanced arms E E and prevents a depression of the cages F F at all points excepting on the side next to the discharge-aperture of the weighing-machine.

There is a notch B⁵ in the stop-piece B⁴, Fig. 3, on the side toward the weighing-machine, which allows a movement of the arms E E when they are in that position. The stop-piece B⁴ is prevented from turning with the table by the arm B⁵, which extends to and locks into the guiding-arm J⁷, Figs. 1 and 2.

When a cage leaves the position under the plunger, it moves over the end of a receiving-apron S, Figs. 1, 2, 9, 10, and 17. This apron runs over the roller S', mounted in a supporting-frame S², Fig. 17, and is driven by a series of rollers at the opposite end of the supporting-frame S², which will be hereinafter fully described.

S³ is an arm attached to the framework S², Fig. 17, extending to near the compressor-platen, which serves to support the filled cages as they move over toward the end of the apron. During this last-named movement the pin N³, Figs. 6 and 7, mounted upon the arm N², Fig. 17, moves along the contour-piece N⁴, Fig. 17, and by turning the vertical shaft N¹, Fig. 6, and arm N causes the door M of the cage to push out the filled carton upon the apron S, as indicated in Figs. 9 and 10.

Over the supporting-frame S² of the receiv-

ing-apron S is mounted, Fig. 1, a second supporting-frame T², which serves to carry the roller T' and driving mechanism for a second or removing apron T, Figs. 1 and 19. This apron T serves to remove the packages after they have been labeled or otherwise sealed up. It is inclosed in a casing in order that no packages may be placed upon it except through the doorways T³ T³, which are provided with the centrally-hung doors T⁴ T⁴, Figs. 1 and 19. The removing-apron T is made, preferably, of a width equal to at least three times the width of the package to be transmitted in order that the packages may not become blockaded.

The inclosing case of the removing-apron is preferably constructed in the following way: At regular intervals along the framework T² are attached the vertical iron standards T⁵ T⁵, having two vertical grooves and which show when cut across horizontally a section like the letter H, Fig. 19. The vertical grooves of the standards T⁵ T⁵ are adapted to allow the introduction vertically of wooden frames or panels, the frames sliding in the grooves like a window-sash in its casing and appear therein in horizontal section, as shown in Fig. 19. Two kinds of frames are shown, T⁶ T⁶ and T⁷ T⁷, which are arranged alternately along each side of the framework T² and also in such a manner that the frames T⁶ T⁶ are located opposite the frames T⁷ T⁷, Fig. 19. The frames T⁶ T⁶ are represented in the drawings as ordinary window-sash, but might consist of a wooden panel or other suitable material. The frames T⁷ T⁷, on the other hand, are adapted to receive and support the frames T⁸ T⁸ of the doorways T³ T³ and also the casings U U of the registering devices. The top of the main casing is made in an ordinary manner, not needing especial illustration, by simply laying stringers across the tops of opposite standards T⁵ T⁵ and boarding over the whole. The construction shown enables the casing and its connected parts to be readily put together or taken to pieces.

Mounted within the casing U, Figs. 19, 20, and 22, is a vertical shaft U'. This shaft carries near its lower end the three-arm turnstile U². The shaft U' carries also the small pinion U³, which meshes into the suitably-proportioned gear U⁴, the latter being connected by the shaft U⁵ with a train of gears such as are used for registering in ordinary gas-meters, and are here designated as a whole by U⁶, the face of the dial being visible in Fig. 1. Vertical partitions T⁹ T⁹, curved at one end and shown in horizontal section in Fig. 19, are suspended from the top of the casing before each of the frames T⁷ T⁷, as shown, for the purpose of preventing the packages placed upon the removing-apron T through one doorway from interfering with the registering mechanism connected with other doorways. The doors T⁴ T⁴ are designed to render the turnstile U² U² inac-

cessible from their respective doorways, and thereby prevent tampering with the registering device. The doors are held normally in their open position by the springs T¹⁰ T¹⁰, Fig. 19.

- 5 In Fig. 19, *x* indicates a package which has been placed upon the removing-apron T through one of the doorways T³ and is being moved by the apron toward the turnstile U².
 10 On the other side of the apron, *y* represents a package which has passed the door T⁴ (the latter having swung back to its normal position) and which is acting upon the turnstile U², which it will leave in the position shown by
 15 the turnstile on the opposite side of the apron.

In connection with the turnstile U² is a locking device adapted to prevent the rotation of the turnstile, excepting when a package is actually going through, Figs. 20, 21, and 22. It consists of a small horizontal shaft U⁷, which is provided with the bent arm U⁸ and the dependent arm U⁹, all being mounted upon a suitable support attached to the frame T¹. The arm U⁸ engages with
 20 the projections U¹⁰ U¹⁰ on the small disk U¹¹, the latter being firmly attached to the vertical shaft U¹. This device prevents the turnstile from rotating unless the arm U⁸, Fig. 22, is raised out of engagement with the projections U¹⁰ U¹⁰ by the action of a passing
 25 package on the dependent arm U⁹, as shown in Fig. 22.

Fig. 18 shows, in vertical section, the method of driving and tightening the aprons, both the apron S and the apron T being driven in the same manner. The roller S⁴ is free like S', Fig. 17—that is to say, it does not act to drive the belt, but simply to support it. It allows the apron to be run closely to the edge
 35 of any apron at right angles to it for the transfer of packages. The driving of the apron is accomplished by running it, as shown, around the rollers S⁵, S⁶, S⁷, and S⁸, which are all suitably geared together and driven at the
 40 same speed. The slack of the apron is taken up and tension thereon maintained by the weighted tightened roller S⁹, mounted upon a suitable frame. The light canvas belts, which are best adapted for use as conveying-aprons,
 45 have very little adhesion to the surface of a driving roller or pulley, especially when covered with flour or other powders. The use of the powerful driving mechanism herein shown and described is therefore very desirable.
 50

I will now briefly describe the operation of the apparatus. The cartons, generally delivered in the collapsed or flattened form, are quickly "shaped up" and placed in the cages
 55 by the operator, who is seated beside the table. When the weighing-machine discharges a load into the carton in the cage directly beneath it, the corresponding balanced arm which supports the cage is depressed at its
 60 outer end, and the table-latch is thereby disengaged. This allows the table to rotate by means of its friction-driving plates until the

next cage is brought under the weighing-machine, and in this manner at each discharge
 65 of the weighing-machine a fresh carton is presented to be filled. Each partial rotation of the table induces other movements, notably that of the compressing-plunger, which is next to be considered. Each time the table advances a step—viz., from one cage to
 70 the succeeding one—it brings a filled carton over the platen and under the compressing-plunger. At the same time one of the projections on that friction-disk which is rigidly connected with the table throws the clutch-
 75 latch into engagement with the continuously-rotating clutch-wheel, as shown in Fig. 15. This causes the compressor-crank to make a single rotation and the compressing-plunger a single stroke (down and up again) into the
 80 carton and cage beneath it, and in so doing causes the door to close the open side of the cage upon the descent of the plunger and to open again on its return or upward stroke. At the end of the rotation the clutch is thrown
 85 out of engagement by coming in contact with the other side of the projection on the friction-plate which threw it in, as shown in Fig. 14, and the compressor-crank is held and exactly located by the spring-stops, as shown
 90 in Fig. 16.

Another movement which takes place at each advance of the table is that of expelling from its cage and placing upon the receiving-apron the filled and compressed carton which
 95 has just left the position under the compressor-plunger. This is accomplished by the expelling-door at the back of the cage, which is forcibly swung outward by the contour-piece attached to the framework of the receiving-apron and shown plainly in Fig. 17.

After the packages are by the action of the expelling mechanism placed upon the receiving-apron they pass before the labelers or sealers, who sit along the sides of the apron.
 100 As soon as a package is labeled or sealed up the operative puts it through a doorway in the case of the removing-apron, whereupon it is recorded by passing through a registering device. There is a doorway and accom-
 105 panying registering device for each operative, and as this kind of work is usually what is known as "piecework" the labor of checking off the amount the operatives do becomes very simple.
 110

The removing-apron may deliver the completed packages to other conveyers or take them through drying apparatus or otherwise, as desired.

I claim—

1. In an apparatus for filling packages, a rotating table having balanced arms, said arms being provided with cages adapted to hold packages to be filled, and said table having a latch device operated by said balanced
 115 arms as described and said latch being adapted to prevent the rotation of said table until released by a discharge of material into a package held by one of the said cages, and

means for causing the rotation of said table when the said latch is released; in combination with a compressing device adapted to operate in unison with the movements of the said table, a door actuated in unison with said compressor and adapted to close each cage in due order and support the packages for compression and necessary connecting parts, substantially as and for the purpose set forth.

2. In an apparatus for filling packages, a rotating table having balanced arms, said arms being provided with cages adapted to hold packages to be filled, and said table having a latch device operated by said balanced arms as described and said latch being adapted to prevent the rotation of said table until released by a discharge of material into a package held by one of the said cages, and means for causing the rotation of said table when the said latch is released; in combination with a series of expelling devices one for each cage, adapted to expel filled packages from said cages and necessary connecting parts, substantially as and for the purpose set forth.

3. In an apparatus for filling packages, a rotating table having balanced arms and a latch device cooperating with said arms substantially as described and means for rotating the said table upon the releasing of said latch; in combination with a compressing-plunger and means for operating the same in unison with the movements of said table, a secondary table-latch adapted to be released by a movement of the said compressing-plunger and necessary connecting parts, substantially as and for the purpose set forth.

4. In an apparatus for filling packages, a rotating table adapted to present packages to be filled and mechanism for controlling the movements of said table, the projections Q^5 Q^5 and the disk Q' , said disk rotating with the said table; in combination with the clutch-latch P^2 , said latch being adapted to be thrown in and out of engagement by said projections substantially as described, the shaft O and suitable mechanism for connecting said latch with said shaft, the continuously-rotating clutch-wheel P , the compressor-crank J^2 , the compressing-plunger J and necessary connecting mechanism, substantially as and for the purpose set forth.

5. In an apparatus for filling packages, a clutch mechanism adapted to operate a compressing-plunger and consisting of the following parts; the latch P^2 , the continuously-rotating clutch-wheel P , the spring P^6 , the links P^7 P^7 , necessary connecting mechanism and means for forcing the latch P^2 in and out of engagement as required, substantially as and for the purpose set forth.

6. In an apparatus for filling packages, a clutch mechanism adapted to operate a compressing-plunger and consisting of the following parts; the latch P^2 , the continuously-rotating clutch-wheel P , the shaft O , the latch-

holding arm P' , loosely mounted on the said shaft, the bifurcated arm P^3 , rigidly attached to the said shaft and embracing an end of the arm P' and the rubber concussion-pieces P^5 P^5 , necessary connecting mechanism and means for forcing the said latch P^2 , in and out of engagement as required, substantially as and for the purpose set forth.

7. In an apparatus for filling packages, in combination, the compressor-crank J^2 , the stop-pieces R R' , the spring R' , a suitable supporting-frame and necessary connecting mechanism, whereby the said crank J^2 is exactly located and held in position after each of its movements, substantially as and for the purpose set forth.

8. In an apparatus for filling packages, in combination, a rotating table with suitable regulating mechanism, the vertical driving-shaft B^3 , the continuously-rotating friction-plate Q , the friction-plate Q' , rigidly attached to the said shaft B^3 , and having the projections Q^5 Q^5 , the latch P^2 , adapted to engage with the said projections and be thrown in and out of engagement thereby and having a spring adapted to hold it in or out of engagement as placed, the arm P' adapted to support the latch P^2 , the shaft O , upon which the arm P' is loosely mounted, the bifurcated arm P^3 having rubber concussion-pieces adapted to embrace the arm P' and being rigidly attached to the shaft O , the continuously-rotating clutch-wheel P , loosely mounted upon the said shaft O , the compressor-crank J^2 , the connecting-rod J^3 , the plunger-rod J' , the plunger J , and necessary connecting mechanism, all operating together substantially as described and for the purpose set forth.

9. In an apparatus for filling packages, the rotating table B and suitable driving and controlling mechanism and the balanced arms E E ; in combination with the stop-piece B^4 having a notch B^6 as described and also having the arm B^5 connected with some external stationary part for preventing the stop-piece B^4 from turning with the table, the vertical driving-shaft B^3 upon which the stop-piece B^4 is loosely mounted and necessary connecting mechanism, substantially as and for the purpose set forth.

10. In an apparatus for filling packages, in the cage F , the combination of the fixed sides F' and F^2 and the funnel F^3 mounted upon the said fixed sides; with the movable hinged side F^4 and necessary connecting parts, substantially as and for the purpose set forth.

11. In an apparatus for filling packages, the cage F having the fixed sides F' and F^2 , the hinged side F^4 and the funnel F^3 ; in combination with the expelling-door M and mechanism adapted to operate the said door M , substantially as and for the purpose set forth.

12. In an apparatus for filling packages, the cage F ; in combination with the expelling-door M , the arm N , the shaft N' , the arm N^2 , the pin N^3 , the contour-piece N^4 , the spring M^2 and necessary supporting and connecting

mechanisms, substantially as and for the purpose set forth.

13. In an apparatus for filling packages, the cage F having the fixed sides F¹ and F², and the hinged side F⁴; in combination with the door K having the embracing arms K² K³ and adapted to close the open side of said cage and shut the said hinged side F⁴, and necessary supporting and operating mechanisms, substantially as and for the purpose set forth.

14. In an apparatus for filling packages, in combination, the cage F having one open side, the pivoted door K adapted to close the open side of said cage, the links K' K', the rod J⁵, collar J⁶, guiding-bar J⁴, plunger-rod J' and necessary supporting and actuating mechanisms, substantially as and for the purpose set forth.

15. In an apparatus for filling packages, a rotating table with suitable driving and regulating mechanism; in combination with the compressing-plunger J, the plunger-rod J', the rod J⁵, the secondary latch L adapted to be released by a stroke of said plunger and necessary actuating and connecting parts, substantially as and for the purpose set forth.

16. In an apparatus for filling packages, a rotating table having balanced arms adapted to support packages, said table having suitable actuating and regulating mechanism; in combination with a compressor-platen adapted to support said arms while material in the packages is being compressed, a suitably-actuated compressing-plunger adapted to operate in unison with the movements of said table and necessary connecting and supporting mechanisms, substantially as and for the purpose set forth.

17. In an apparatus for filling packages, a latch device consisting of; first, the loosely-mounted cylindrical stop-pin D, free to be gradually turned by the jar due to its ordinary operation and its socket; and second, the rotatable latch-roller C⁴ adapted to make a contact upon its flat end with the cylindrical stop-pin D, and necessary supporting and connecting mechanism, substantially as and for the purpose set forth.

18. In an apparatus for filling packages, the apron S, the roller S' and the roller S⁴, said rollers being adapted only to extend and support said belt and to be turned freely by it; in combination with the suitably-mounted tightening-roller S⁵, and the driving mechanism comprising the driven rollers S⁵, S⁶, S⁷ and S⁸, said apron passing around said driven and tightening rollers substantially as shown, the said rollers S⁵, S⁶, S⁷ and S⁸ being so connected together that each rotates in the appropriate direction with the same speed and assists the others in driving the apron, and necessary supporting and connecting mechanisms, whereby the apron is driven with great power,

even tension maintained therein and the end of the apron which is supported by the roller S⁴, by being unencumbered by driving mechanism, is adapted to closely approach an apron moving at right angles across it, substantially as and for the purpose set forth.

19. In an apparatus for filling packages, in combination, the removing-apron T inclosed within a casing, the turnstile U², the register U⁶, the doorway T³, the centrally-hung door T¹, the partition T⁹ and necessary connecting and supporting mechanisms, substantially as and for the purpose set forth.

20. In an apparatus for filling packages, in combination, the removing-apron T inclosed within a casing, the turnstile U², the register U⁶, the doorway T³, the locking device embracing the dependent arm U⁹, the arm U⁸, and the disk U⁷ having the projections U¹⁰, and all necessary connection and supporting mechanisms, substantially as and for the purpose set forth.

21. In an apparatus for filling packages, the removing-apron T having suitable supporting and driving rollers; in combination with an inclosed casing consisting of the frames T² T², the vertical grooved standards T⁵ T⁵, the frames T⁶ T⁶, the frames T⁷ T⁷ having doorways and adapted to support registering devices, said frames T⁶ T⁶ and T⁷ T⁷ being adapted to slide in the grooves of the standards T⁵ T⁵ as shown, a suitable top for the whole casing, and necessary connecting and supporting mechanisms, substantially as and for the purpose set forth.

22. In an apparatus for filling packages, in combination, a rotating table having suitable actuating and regulating mechanism and adapted to receive, transmit and deliver packages, a moving receiving-apron adapted to receive packages from said table and deliver them to labelers, a removing-apron, said removing-apron being inclosed in a casing having doorways through which completed packages may be placed upon said removing-apron, and said casing having also registering devices suitably arranged with reference to said doorways, and all necessary supporting and connecting mechanism, whereby filled packages may be automatically placed before the labelers and after being labeled may be automatically removed and their number recorded, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 9th day of February, A. D. 1897.

WILLIAM EMERY NICKERSON.

Witnesses:

FRANK G. PARKER,
WILLIAM H. PARRY.