No. 782,987. PATENTED FEB. 21, 1905.

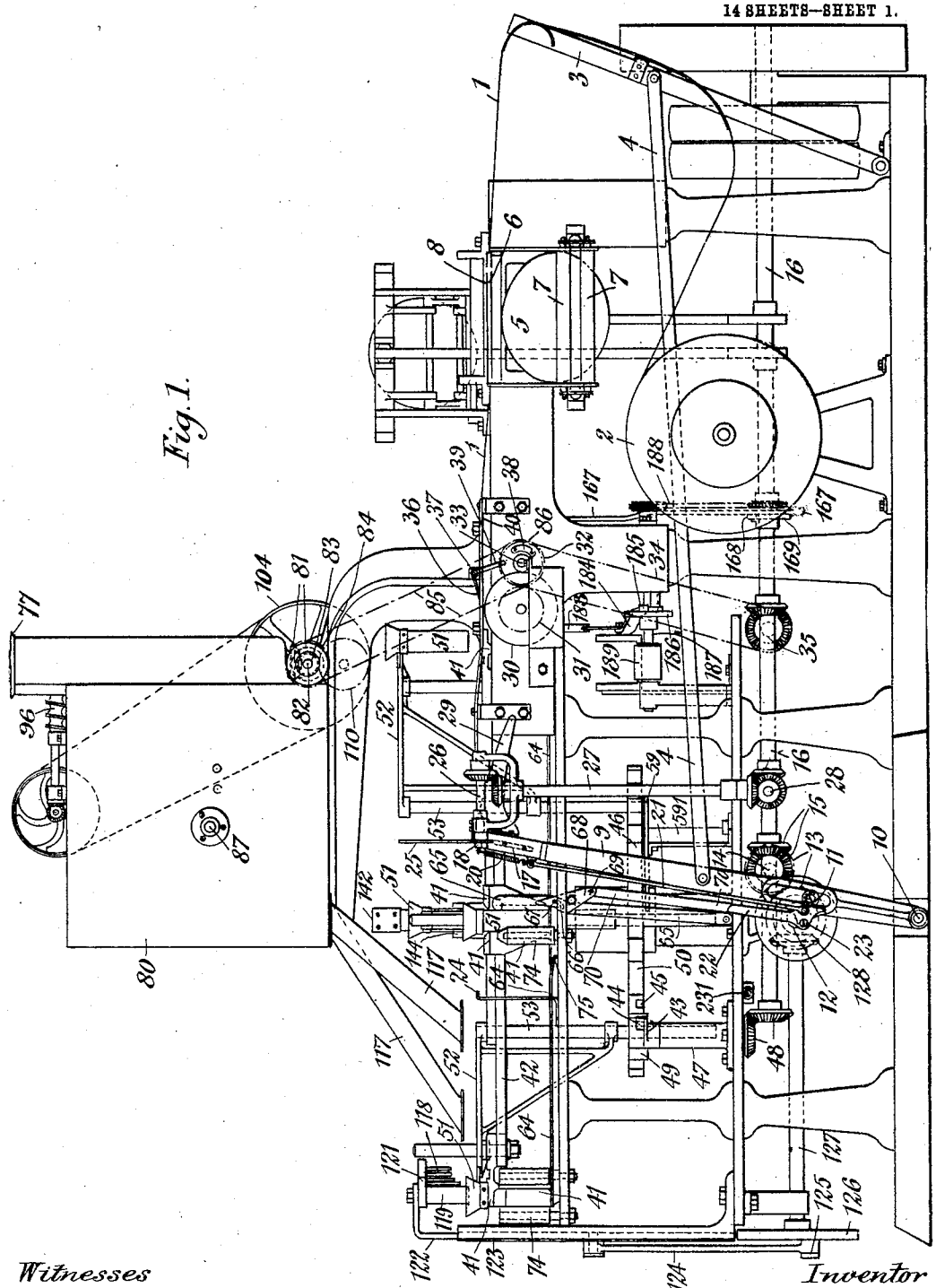
E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 1.

Fig. 1.



Witnesses

S. N. Perkins.

E. B. Bruce.

Inventor

Edward Thomas Pollard,

By his Attorneys

Baldwin, Davidson & Wright

No. 782,987. PATENTED FEB. 21, 1905.

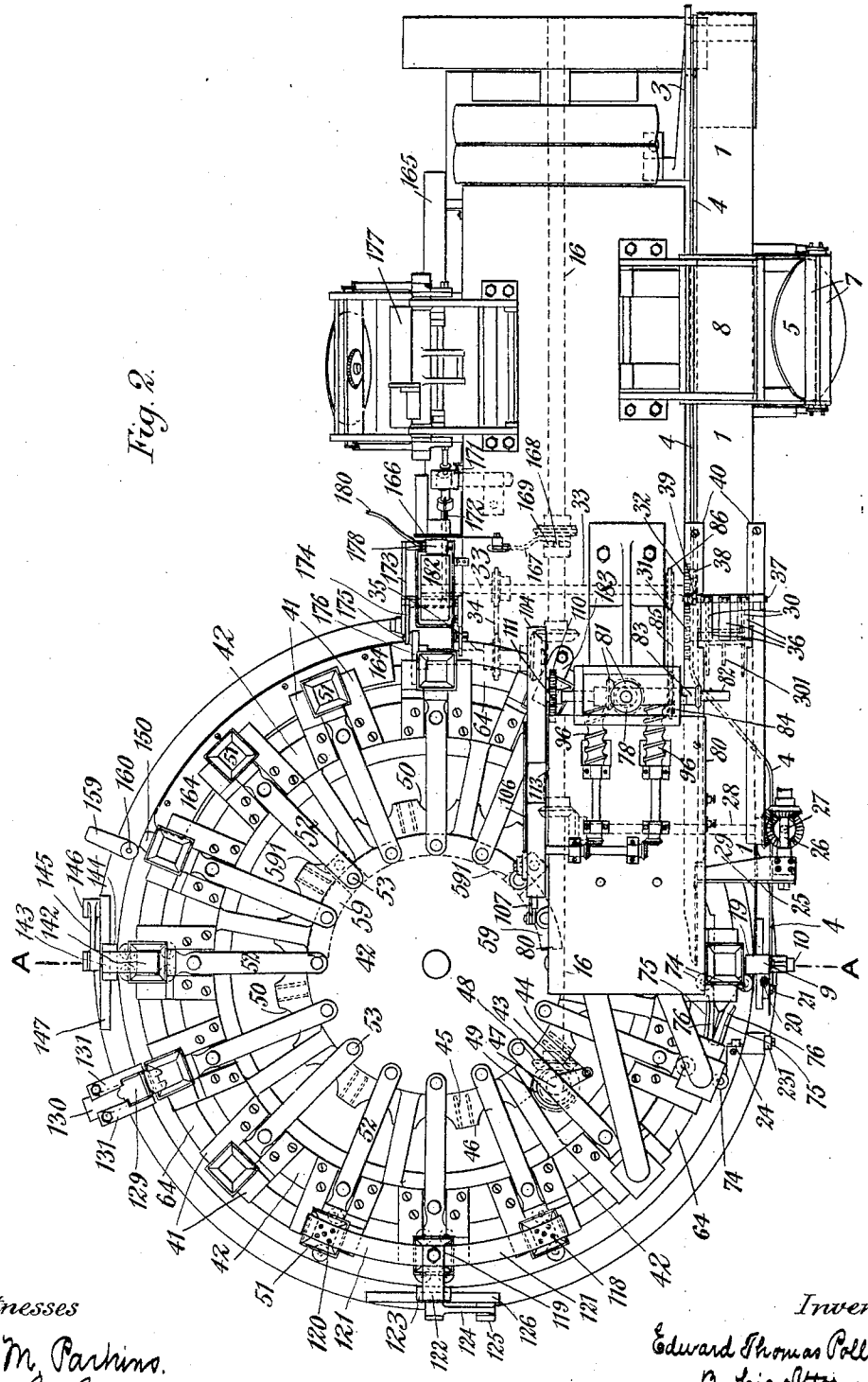
E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 2.

Fig. 2.



Witnesses

A. M. Parkins.

E. B. Bruce.

Inventor

Edward Thomas Pollard,

By his Attorneys,

Baldwin Davidson & Wright

No. 782,987. PATENTED FEB. 21, 1905.

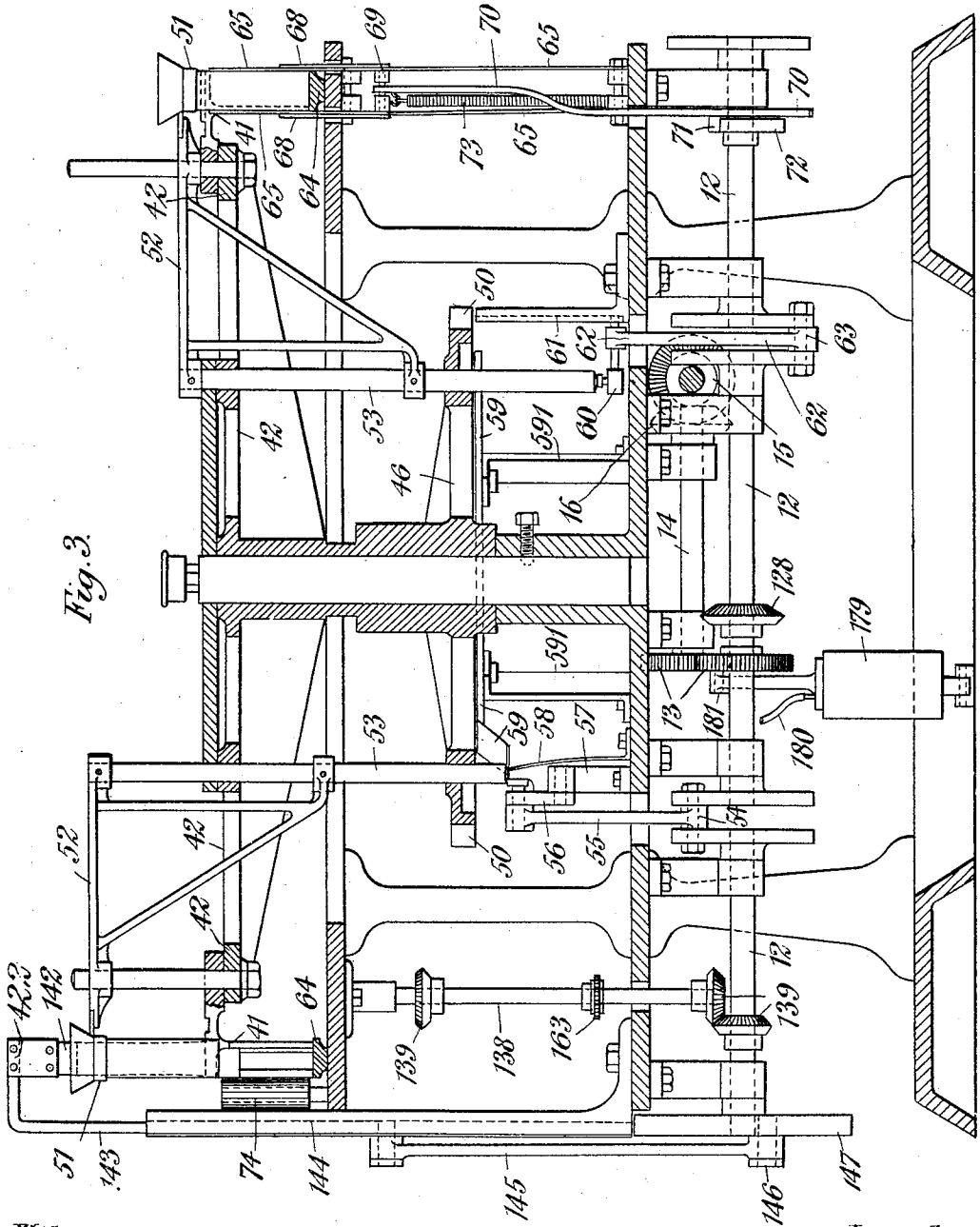
E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 3.

Fig. 3.



Witnesses

A. M. Perkins.

C. B. Brewer.

Inventor

Edward Thomas Pollard,

By his Attorneys

Baldwin, Davidson & Wright.

No. 782,987. PATENTED FEB. 21, 1905.

E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 4.

Fig. 4.

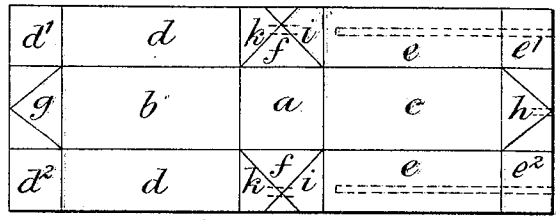


Fig. 5.

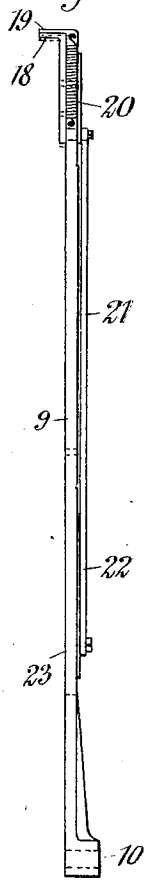


Fig. 6.

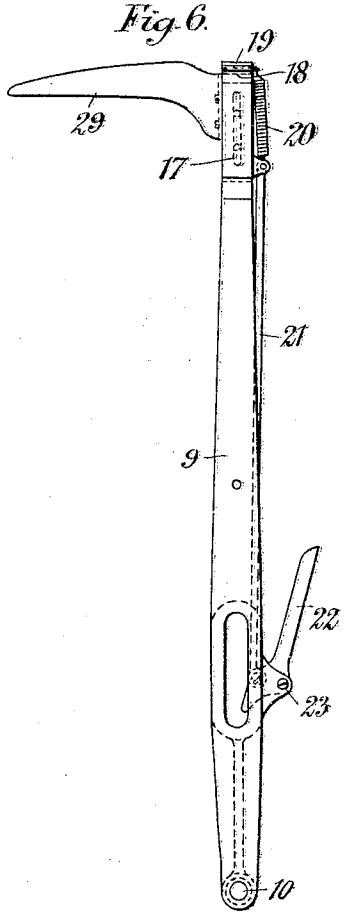
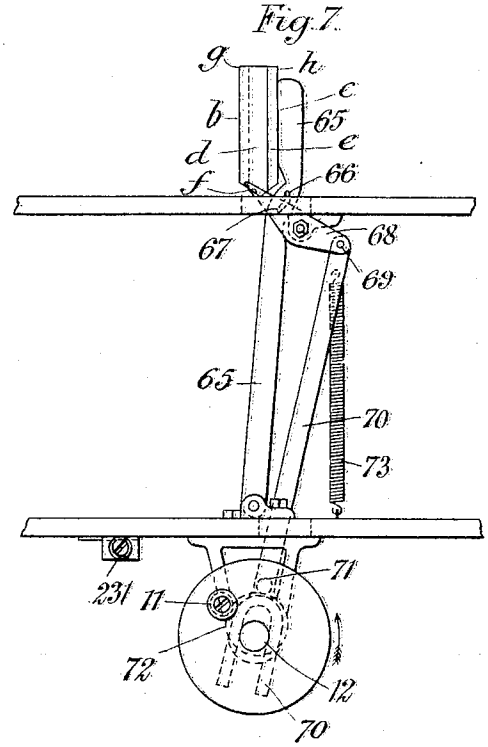


Fig. 7.



Witnesses

A. M. Parkins.

E. B. Brune.

Inventor

Edward Thomas Pollard,

By his Attorneys

Baldwin, Davidson & Wright.

No. 782,987. PATENTED FEB. 21, 1905.

E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 5.

Fig. 8.

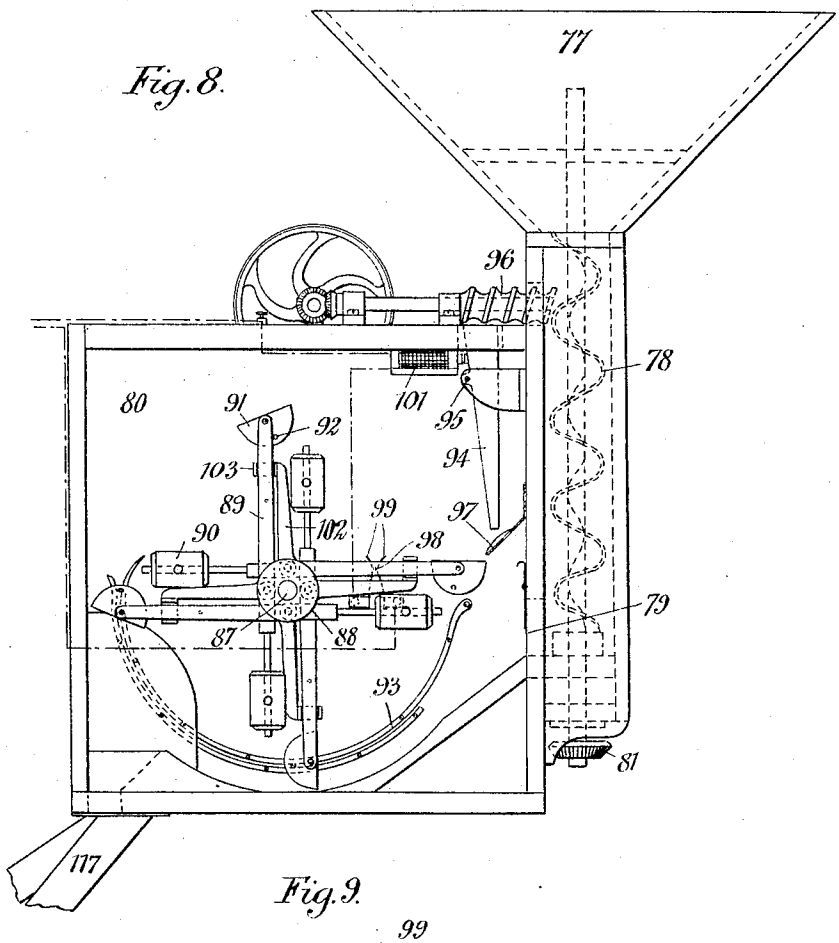
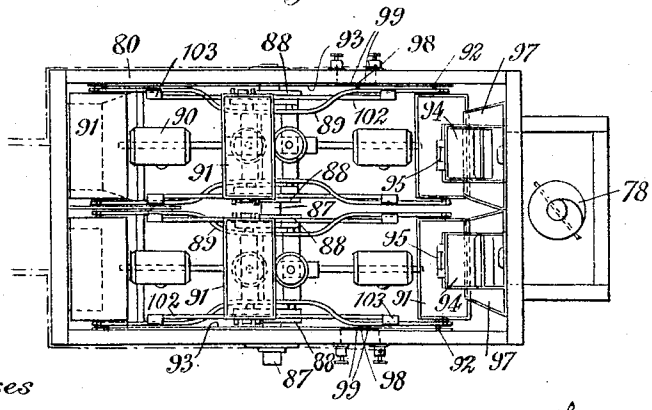


Fig. 9.



Witnesses

A. M. Parkins.

E. B. Bruner.

Inventor

Edward Thomas Pollard,

By his Attorneys,

Baldwin Davidson & Wright

No. 782,987. PATENTED FEB. 21, 1905.

E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 6.

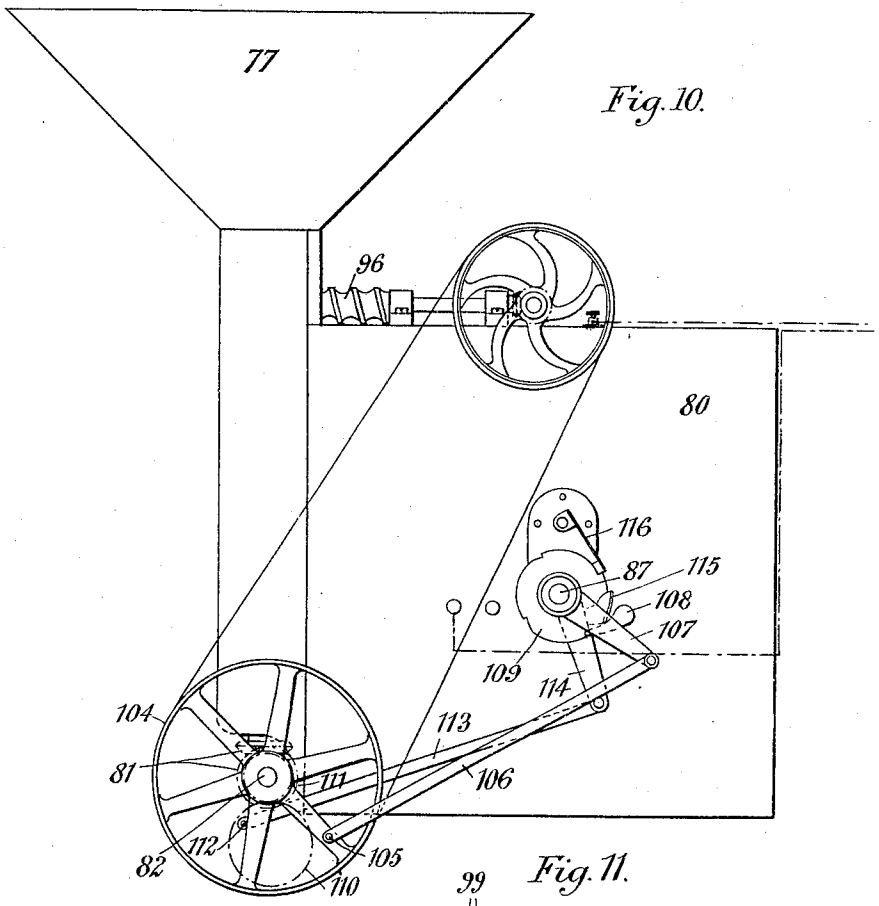


Fig. 10.

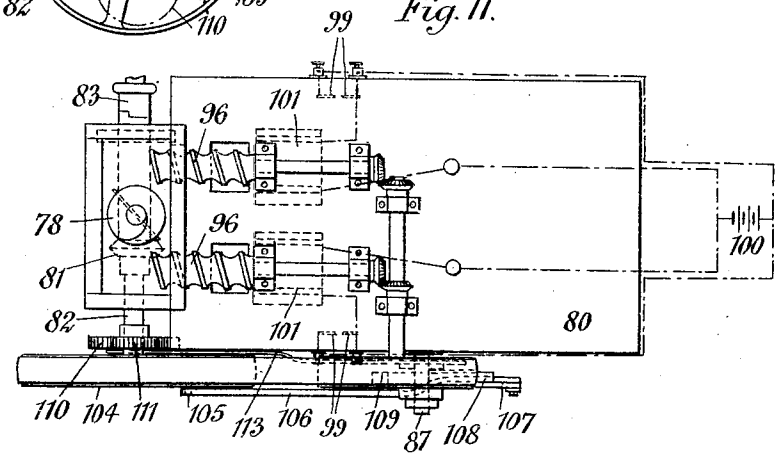


Fig. 11.

Witnesses

A. M. Parkins.

E. B. Brewer.

Inventor

Edward Thomas Pollard,

By his Attorneys,

Baldwin Davidson & Wright.

PHOTO-LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 782,987. PATENTED FEB. 21, 1905.

E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 7.

Fig. 12.

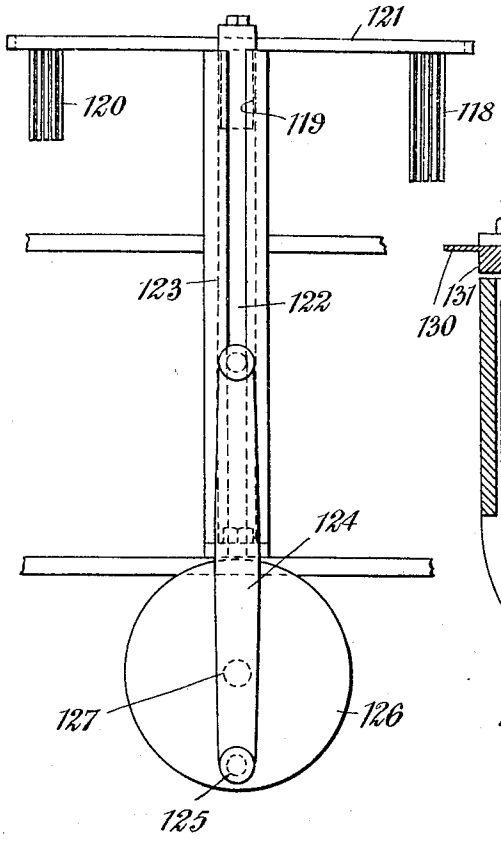


Fig. 13.

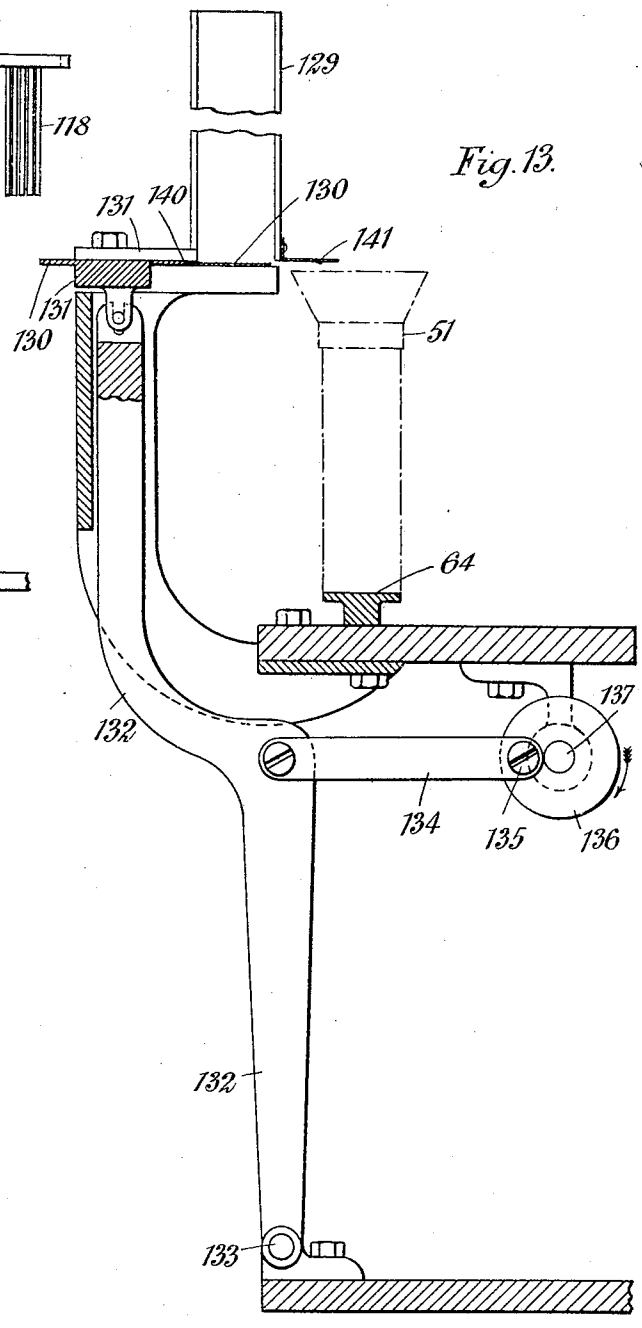
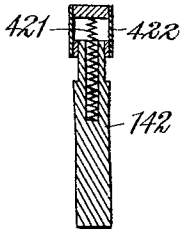


Fig. 14.



Witnesses

A. M. Parkins.

C. B. Brunn.

Inventor

Edward Thomas Pollard,

By his Attorneys,

Baldwin Davidson & Wight

PHOTO-LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 782,987. PATENTED FEB. 21, 1905.

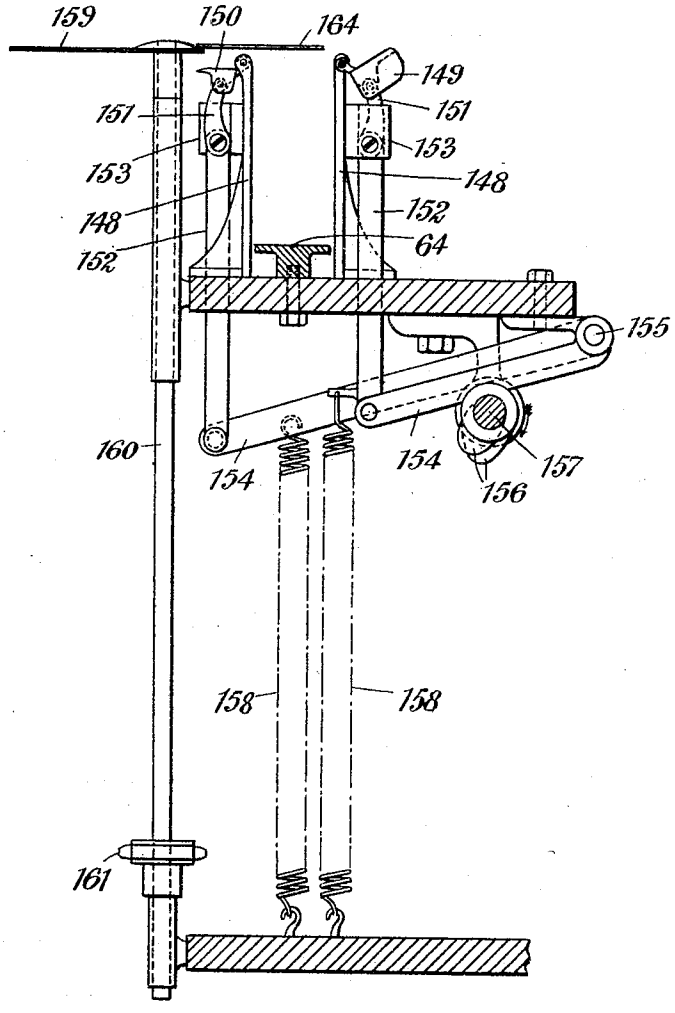
E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 8.

Fig. 15



Witnesses

A. M. Parkins.

C. B. Brener.

Inventor

Edward Thomas Pollard,

By his Attorneys,

Baldwin, Davidson & Wright

No. 782,987. PATENTED FEB. 21, 1905.

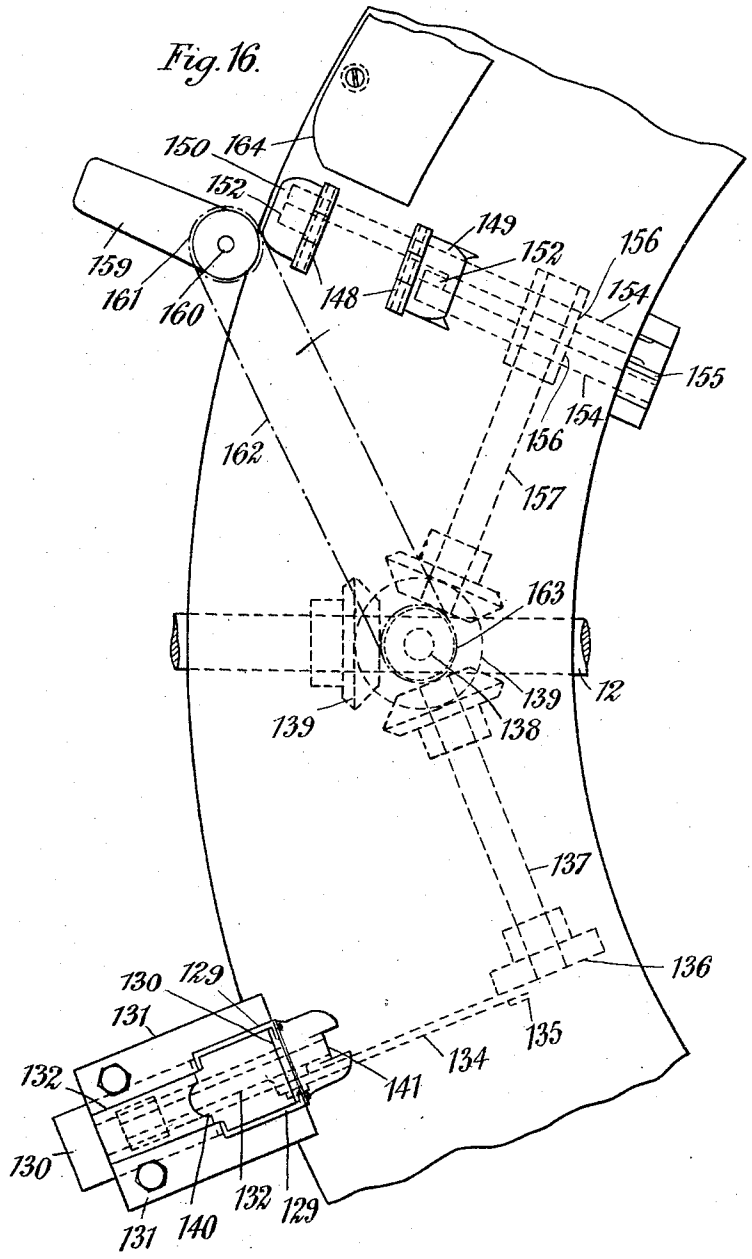
E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 9.

Fig. 16.



Witnesses

A. M. Parkins.
C. B. Brunet.

Inventor

Edward Thomas Pollard,
By his Attorneys,
Baldwin, Davidson & Wright.

No. 782,987. PATENTED FEB. 21, 1905.

E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 10.

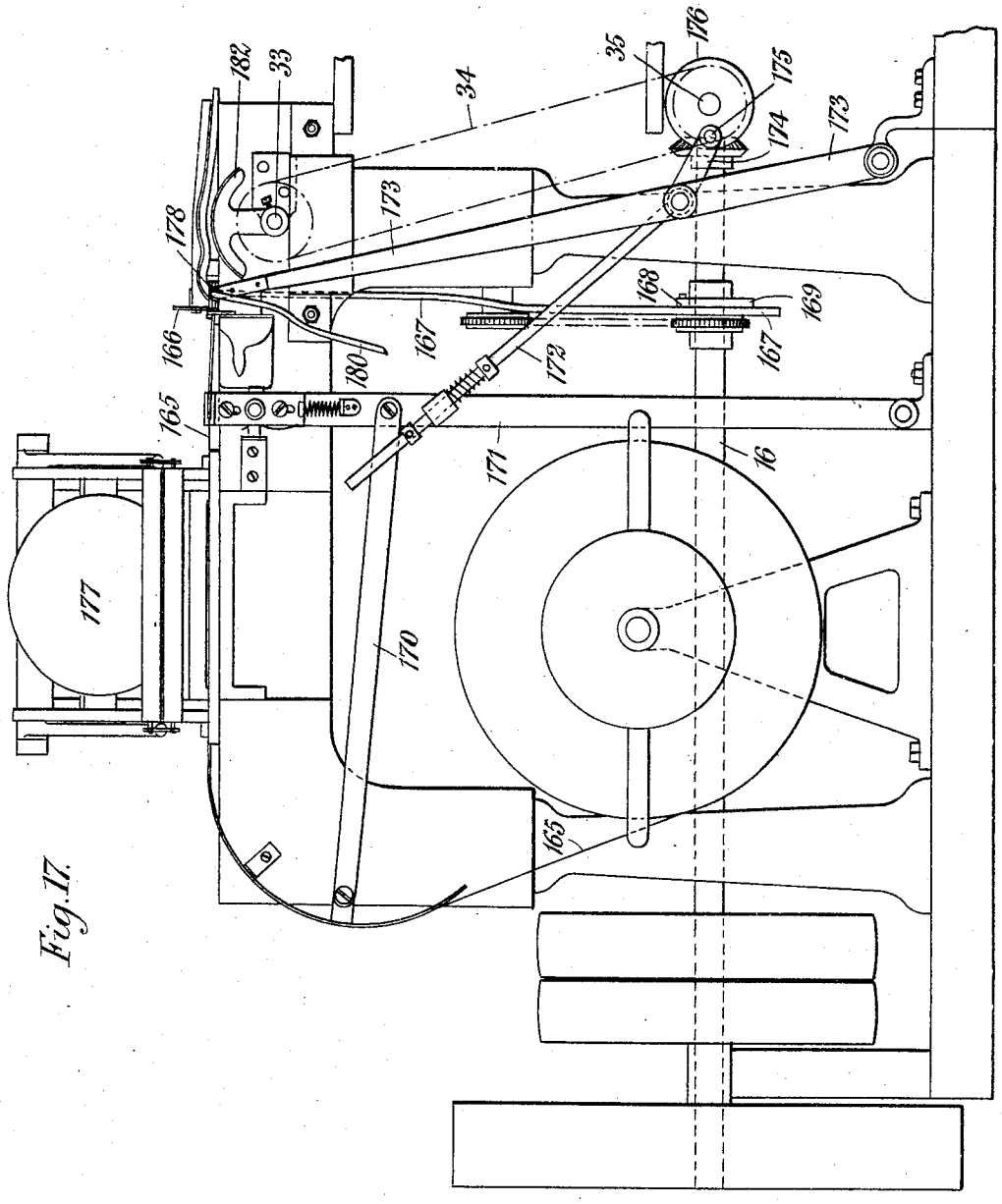


Fig. 17.

Witnesses

A. M. Parkins.

C. B. Brewer.

Inventor

Edward Thomas Pollard,

By his Attorneys,

Baldwin, Davidson & Wright

No. 782,987. PATENTED FEB. 21, 1905.

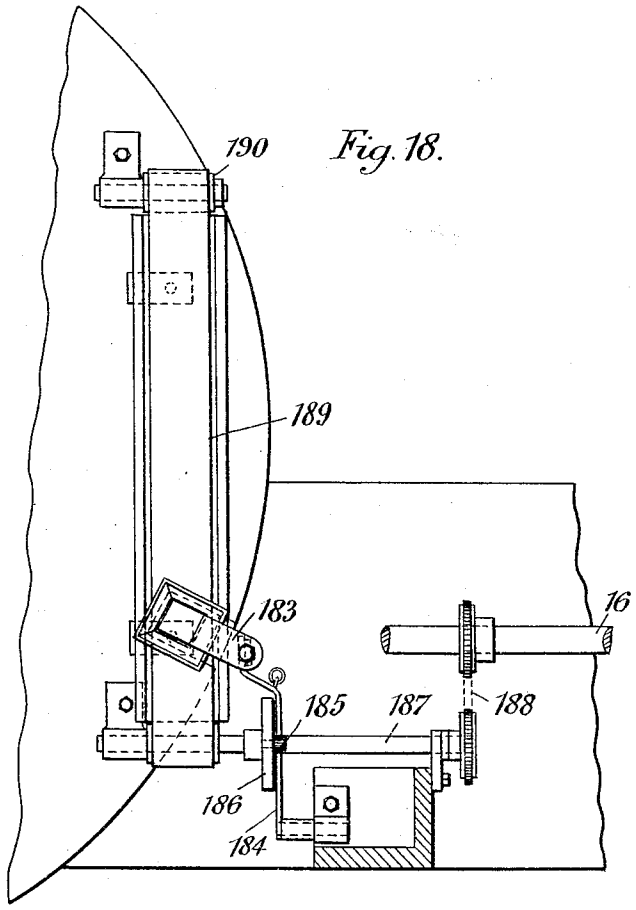
E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 11.

Fig. 18.



Witnesses

A. M. Parkins.

C. B. Brune.

Inventor

Edward Thomas Pollard,

By his Attorneys,

Baldwin, Davidson & Wright.

No. 782,987. PATENTED FEB. 21, 1905.

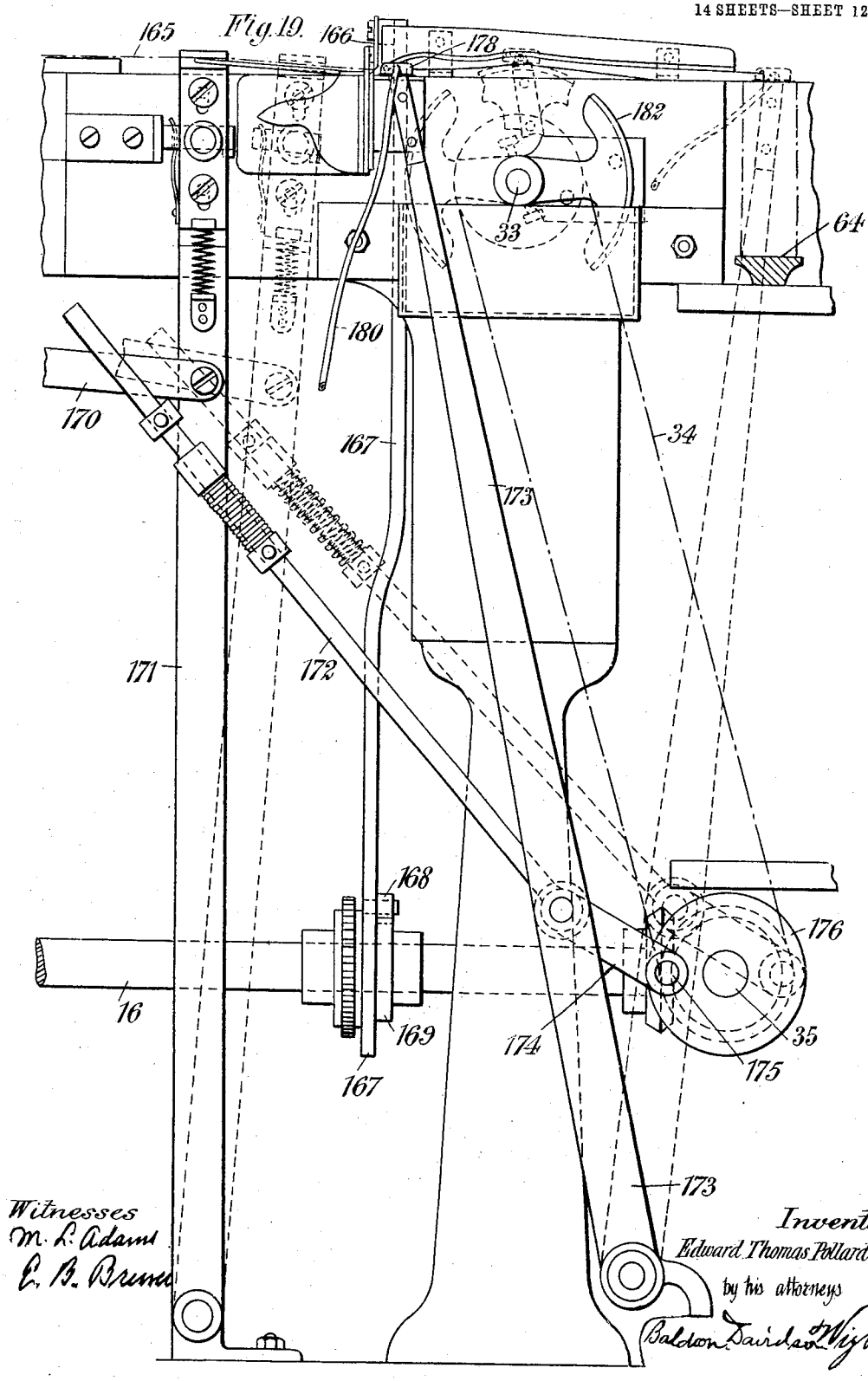
E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 12.

Fig. 19.



Witnesses
M. L. Adams
E. B. Brunn

Inventor,
Edward Thomas Pollard,
by his attorneys
Baldwin Dairdson & Wright

PHOTO-LITHOGRAPHED BY SACHETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 782,987. PATENTED FEB. 21, 1905.

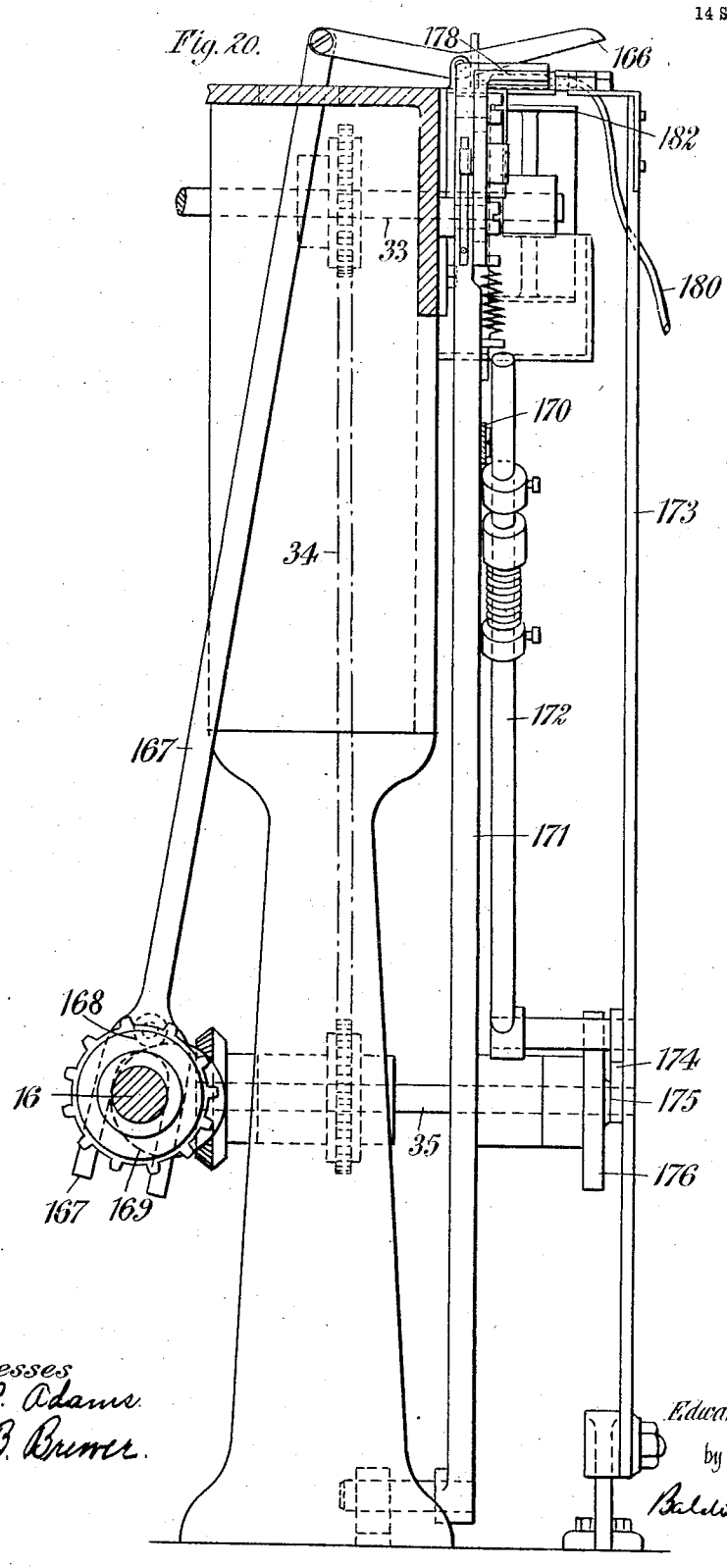
E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 13.

Fig. 20.



Witnesses
M. L. Adams.
E. B. Bruner.

Inventor;
Edward Thomas Pollard,
by his attorneys
Baldwin Davidson Wight

No. 782,987. PATENTED FEB. 21, 1905.

E. T. POLLARD.

PACKETING MACHINE.

APPLICATION FILED JUNE 25, 1903.

14 SHEETS—SHEET 14

Fig. 23.

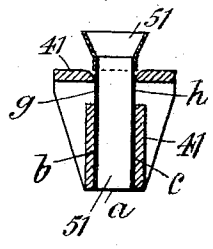


Fig. 24.

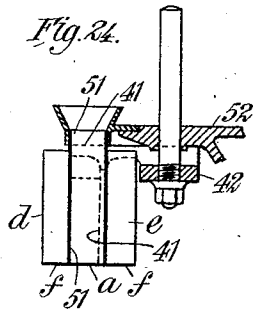


Fig. 22.

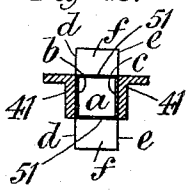
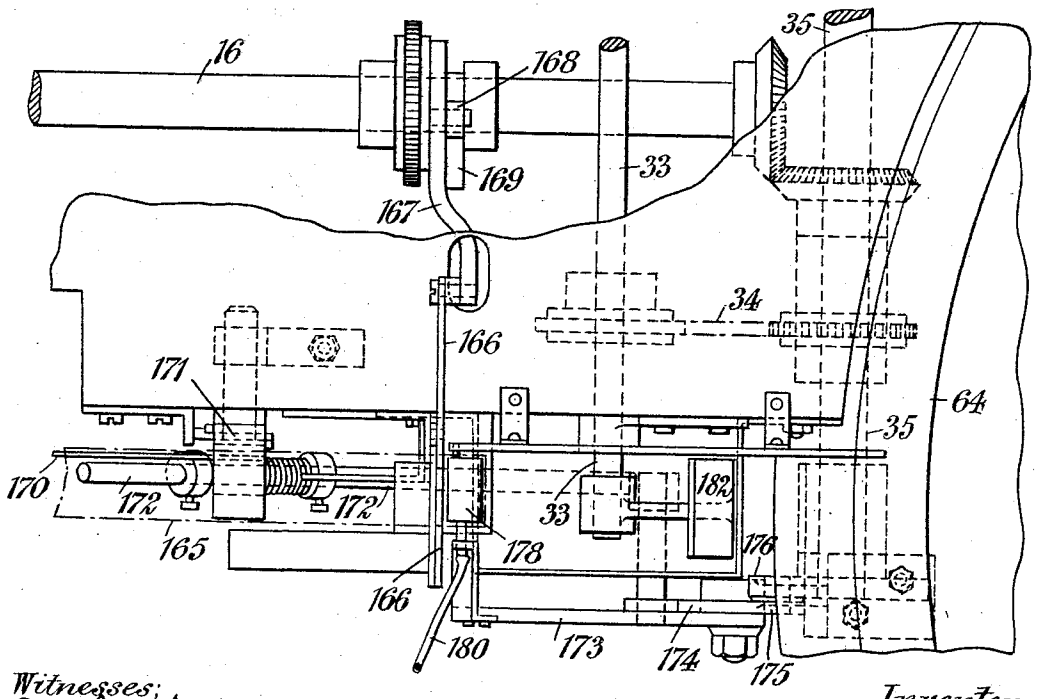


Fig. 21.



Witnesses;
M. L. Adams
C. B. Brewer.

Inventor;
Edward Thomas Pollard,
by his attorneys
Baldwin Davidson & Wright.

No. 782,987. Patented February 21, 1905.

UNITED STATES PATENT OFFICE.

EDWARD THOMAS POLLARD, OF LONDON, ENGLAND.

PACKETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 782,987, dated February 21, 1905.

Application filed June 25, 1903. Serial No. 163,147.

To all whom it may concern:

Be it known that I, EDWARD THOMAS POLLARD, engineer, a citizen of the United States, residing at 25 Whitecross street, in the city of London, England, have invented certain new and useful Improvements in Packeting-Machines, of which the following is a specification.

The object of this invention is to provide a machine which shall print a continuous web of paper, cut the paper into lengths, form it into bags, fill the bags with a weighed quantity of material, and close and secure the bags.

According to this invention the paper is drawn off a reel past a cutter, which cuts off the required length. The paper arrives at a horizontal mold-wheel, to which a step-by-step movement is imparted. Around the circumference of the wheel are a number of molds each formed of a pair of vertical plates hanging down through a hole in the wheel, to which they are secured by flanges at their upper ends. Each mold is provided with a hollow former, carried by a radial arm on a vertical rod working in a hole in the mold-wheel. When the rectangular paper blank the sides of which have been suitably pasted by a revolving paster arrives over the wheel, a former descends upon it. As the former strikes the center of the paper it pushes it down between the mold-plates, and the sides are then turned in by folders and the paste holds the sides together. The two triangular flaps thus left at the bottom are now folded in under the bottom by other folders. When the bag has been so far formed, it arrives beneath the chute of an automatic weighing-machine contructed as follows: A shaft to which a step-by-step movement of a quarter of a revolution is imparted carries scale-beams. Each beam carries at one end a pivoted scoop and at the other a weight. This weighing apparatus is inclosed in a rectangular box, in one corner of which the material lies in a heap constantly replenished from a hopper by a screw. As the shaft revolves a scoop picks up from the heap a little less of the material than it is desired to deliver, the deficit being supplied by a pivoted funnel until the right weight is reached, when the weight at the other end of the beam is balanced by the filled scoop, which falls, so that it completes a circuit including a source of electricity and an electromagnet, which being thus energized turns the funnel on its pivot into a position in which it delivers onto the heap and not into the scoop, which is subsequently carried farther round and discharges its contents down the chute into the bag, which is moved on by the wheel to a plunger or plungers, which pack the material tight. The bag, into the mouth of which a card containing an advertisement may have been inserted, then arrives under a plunger, which descends onto the top of the material or onto the card and holds the contents down, while the former is withdrawn from the bag by reason of a reciprocating lifter coming under the bottom of its vertical rod. As soon as the former is clear of the material the plunger rises quickly, so as to clear the former. The four flaps standing up at the top of the bag are now turned over by suitable folders, after which the bag is secured by a pasted label being pressed down upon it by a reciprocating sucker or other means and the bag is pushed out of its mold by a plunger.

The paper forming the bag and also that for the fastening-label may be printed by printing mechanisms interposed between the reels and the mold-wheel.

The machine may be altered to weigh and parcel another quantity of material by altering the distance apart of the mold-plates, substituting another set of formers and scoops, and altering the position of the weights on the beams or else the weights themselves.

Such a machine may be used for parceling tea, coffee, sugar, rice, seeds, flour, powders, salt, or any similar material.

Figures 1 and 2 of the drawings are a front elevation and plan, on a small scale, of such a machine. Fig. 3 is a section on the line A A, Fig. 2. Fig. 4 is a view of the inside of the bag unfolded on a larger scale, the lines showing the creases. Figs. 5 and 6 are edge and back views of the apparatus drawing off the paper. Fig. 7 shows one of the folders for the sides and bottom of the bag. Fig. 8 is a vertical section of the weighing apparatus; Fig. 9, a plan with the cover and parts above

it removed. Fig. 10 is a back view, and Fig. 11 a plan, of the weighing apparatus. Fig. 12 is a view of the packing-plungers. Fig. 13 shows the apparatus for inserting a card into the bag. Fig. 14 is a section of the plunger 142. Fig. 15 shows the mechanism for folding the top of the bag. Fig. 16 shows the means for conveying motion to these parts, Figs. 13, 15, and 16 being to a larger scale. Fig. 17 is a back view of part of the machine, and Fig. 18 shows the delivery mechanism. Fig. 19 is an enlarged view of part of Fig. 17. Fig. 20 is a view taken at right angles to Fig. 19; and Fig. 21 is a plan to this larger scale, these three views showing the means for affixing the pasted label to the top of the bag. Figs. 22 to 24 are a horizontal and two vertical sections through one of the hollow formers in its lower position in one of the molds with a blank pushed into the mold, but not yet folded.

1 is the paper, which is fed from the reel 2 by a feed-arm 3, rocked by a link 4.

5 is a printing mechanism, with forms 6, ink-rollers 7, and platen 8 of any convenient construction arranged to print the under side of the web.

The paper is drawn off by a gripper-arm 9, pivoted at 10 and rocked by a crank-pin 11 on a disk on the shaft 12, driven by gear-wheels 13 from a cross-shaft 14, driven by miter-wheels 15 from the main shaft 16. Moving in a guide 17 at the top of the arm 9 is a jaw 18, normally held closed against the jaw 19, fast on the arm by a spring 20, attached to a rod 21, pivoted to the lever 22, carried by a fulcrum 23 on the arm 9. In the position shown in Fig. 1 the jaw 18 and rod 21 are down, owing to the pressure of the crank-pin 11 on the tail of the lever 22. As soon, however, as the crank-pin clears the tail of the lever the jaws close (as seen in Fig. 6) and grip the paper, and the arm 9 swings over, owing to the action of the crank-pin, drawing the paper with it until the lever 22 comes in contact with a fixed stop 231. This movement has drawn the leading edge of the paper up against a stop 24, and it is now cut by a knife 25 on a spindle 26, geared to a vertical shaft 27, which is again geared to a cross-shaft 28, driven by miter-gear from the main shaft 16. The arm 9 is furnished with a curved blade 29 to support the outer edge of the paper.

The paper blank which is to form the bag will now be described. This, as is shown in Fig. 4, is rectangular, so that there is no waste, and it may for the sake of reference hereinafter be said to consist of a bottom *a*, front *b*, back *c*, two front flaps *d*, two back flaps *e*, two bottom flaps *f*, front top *g*, and back top *h*. This has already been pasted on its under side along the dotted lines by two pasting-wheels 30, continuously revolved in a paste-box by toothed wheels 31 32 from a shaft 33, driven by a chain 34 from a shaft 35, driven by miter-gear from the main shaft. The paper is pressed against the wheels 30 by fingers 36 on a spindle 37, rocked at the required time by a cam 38 on the wheel 32, acting on an arm 39, fast on the spindle 37. 40 40 are guides for the paper. The blank after being cut is lying with its bottom *a* exactly over one of the molds formed of two right-angled plates 41, carried by the wheel 42, to which a step-by-step movement is given by a crank-arm 43, provided with a roller 44, which engages with recesses 45 in a wheel 46, fast with the wheel 42. In order to avoid overcrowding, only two of these molds and four of their formers are shown in Fig. 1. For the same reason many of the bearings for the shafts and portions of the framing are omitted. The arm 43 is carried on a vertical spindle 47, continuously rotated by miter-gear 48 from the main shaft and acts in conjunction with a segment 49, engaging recesses 50 in the wheel 46 to give a step-by-step movement to the wheels 42 and 46 and to hold them fast between the steps. For each mold (of which there are sixteen in the machine shown, though any other convenient number could be employed) there is a former 51, consisting of four vertical plates depending from a hopper-shaped top carried by a radial arm or bracket 52 on a vertical rod 53, passing through holes in the wheels 42 and 46. These rods can be raised and lowered into the two positions in which they are shown in Figs. 1 and 3. The raising is effected (see Fig. 3) by a crank-pin 54 on the cross-shaft 12, linked by a rod 55 to an arm 56, pivoted to a bracket 57. This arm coming beneath the rod 53 raises it into the position shown, where a spring 58 slips beneath it and holds it until the rotation of the wheels 42 and 46 carries the arm onto a semicircular track 59, carried by brackets 591. (See Figs. 1, 2, and 3.) On this track the end of the rod is supported until it reaches the position on the right of Fig. 3, where the rod is received by an arm 60, reciprocated in a guide 61 by the rod 62 of a crank-pin 63 on the shaft 12. As the former 51 is thus lowered it strikes the paper along the edges of the bottom *a* and pushes the paper down with it between the plates 41, so that the part *a* lies on a circular track 64, on each side of which one part *f* projects, while the rest of the paper is vertical, the parts *b c* and the central portions of *g* and *h* being held between the former 51 and the plates 41. Two folders 65, Figs. 1, 3, and 7, pivoted to the frame, now strike the paper along the lines between *c* and *e*. Each folder 65 has a slot 66, in which moves a pin 67 on a lever 68, pivoted to the frame. The tails of these two levers are connected by a rod 69, to which is connected a link 70, forked to embrace the shaft 12 and having on it a bowl 71, bearing against a cam 72, owing to the pull of a spring 73. As, therefore, this cam rotates, it turns the levers 68 about their

pivots. Since the upper parts of the slots 66 are vertical, or nearly so, the pins 67 move the folders 65 to the left. They strike the paper along the lines between *c* and *e*, and thus turn the back flaps *e* at right angles to the back *c* against the former, forming creases along the lines *i*. The pins 67 now pass into the lower portions of the slots, which are inclined, so that the folders are now drawn back slightly, while the levers 68 continue to move, (till they reach the position shown in Fig. 7, in which the paper blank is shown in its relative position to the levers and folders,) striking the parts *f* and forming creases along the lines *k* and pulling the front flaps *d* over the flaps *e*, the flaps *d* and *e* thus forming the sides of the bag. The wheels 42 46 now move and the front flaps *d* are pressed by rollers 74, between which the mold passes, onto the flaps *e*, to which they are held by the paste. The top of each mold-plate, it may be mentioned, is recessed, as seen in Figs. 1 and 2, in order that the paste may not be touched by it. As the cam 72 continues to move the folders 65 and levers 68 are pulled back by the spring 73 to the position shown in Fig. 1. The rollers 74 may be repeated round the circumference of the mold-wheel wherever support is needed for the sides of the bag, as shown in Fig. 2. The depending triangular pieces of paper formed from the bottom flaps, as has just been described, are as the mold rotates caught by tongues 75, cut in the track 64, and turned into the slots 76, which fold them under the bottom *a*, where they are held by the paste. The tongues 75 and slots 76 are formed by merely making two inclined cuts in the track 64, as seen in Fig. 2, and then leveling off the edges and bending the tongues 75 so formed slightly outward and downward. As, then, the wheel rotates, the paper flaps, one of which is seen in Fig. 7, pass inside the points of the tongues 75 and are drawn into the slots 76, and as the bag continues its progress along the track the beveling of the under face of the **V**-shaped piece and the upper face of the tongues fold the flaps under the bottom *a*. The "bag," as it may now be called, stops in the second position under the chute of an automatic weighing-machine. (Shown in Figs. 8 to 11.) 77 is a hopper filled with, say, tea, which is fed down by a screw 78 to an adjustable opening 79 in the side of a casing 80. The screw is turned, through bevel-wheels 81, from a shaft 82, which can be clutched by a clutch 83 to a sprocket-wheel 84, coaxial with it and gearing with a chain 85, driven by a chain-wheel 86 on the shaft 33. (See Figs. 1 and 2.) By this means tea is fed down to form a heap of approximately constant size in the casing 80. 87 is a shaft to which a step-by-step movement of rotation can be given. Fast with this shaft are four disks 88, which support the trunnions of the forked scale-beams 89. In the apparatus shown there are eight of these beams, in two groups of four, in order to weigh a sufficient quantity of tea for the packing apparatus; but it will be readily understood that there might be more groups than one or only one and that it is not essential that there should be four beams in a group. Each beam carries a weight 90, which is adjustable upon it, and also a scoop 91, pivoted to the beam and so shaped as naturally to hang in the position of the scoop on the right of Fig. 8. The scoops are, however, provided with pins 92, which are caught by guides 93 as the scoops revolve, so as to tip them, as clearly seen in Fig. 8. The tea is fed at such a rate that each scoop as it passes the heap picks up somewhat less than the required weight, and the deficit is supplied by a funnel 94, pivoted at 95 and fed with tea by a screw 96 from the screw 78. The tea from this funnel normally falls onto a shield 97 and thence into the scoop; but so soon as the right weight is reached the scale-beam takes up a horizontal position and a pin 98 upon it makes contact between two curved contact-pieces 99, thus allowing an electric current to flow from a battery 100 to an electromagnet 101, which being energized attracts the funnel 94 so that its lower end comes over a hole in the shield 97, and the tea no longer falls into the scoop, but onto the main heap until the shaft 87 is turned a step, when the circuit is broken as the scale-beam turns and the funnel being released by the magnet swings back. The position shown is that in which the right amount of tea has just been reached and the scale has just balanced, but the funnel has not yet been attracted by the magnet. The disks 88 carry arms 102, each with a pair of lugs 103 embracing the beam, so as to limit its freedom of movement. The movement of the shaft 87 may be effected in any convenient way; but in the present case it is effected as follows: On the shaft 82 is a wheel 104 with a crank-pin 105, connected by a rod 106 to an arm 107, loose on the shaft 87. On this arm is a loaded pawl 108, engaging notches on a disk 109, fast on the shaft 87. If, therefore, this pawl engage with a notch every revolution of the shaft 82, the shaft 87 would turn every time the wheels 42 46 moved; but as all the weighing parts are duplicated the shaft 87 is only required to turn every alternate movement of the packing-machine, bags being filled in the second and third positions. This is effected by a toothed wheel 110 on a stud-axle, which gears with a wheel 111 on the shaft 82, so that the wheel 110 only turns once for every two revolutions of wheel 104. A crank-pin 112 on the wheel 110 is connected by a rod 113 to a second arm 114, loose on the shaft 87 and carrying a shield 115, which is thus moved in front of the pawl 108 every alternate stroke, preventing the pawl from engaging the disk 109. 116 is a spring-detent to prevent backlash. 117 represents the

chutes into which the contents of the scoops are tipped. This arrangement insures a quick movement of the scoops and a long dwell in the weighing position.

In either the second or the third position, then, a bag is filled, while in the third or second position nothing happens to it. In the fourth position a series of vertical rods 118 are lowered into the tea to enable it to settle down close into the bag, and in the fifth position a solid plunger 119 descends onto the tea and compresses it, while in the sixth position more vertical rods 120 descend into the tea. All these rods 118 120 and the plunger 119 are carried by a bar 121, carried by a slide 122, reciprocated in guides 123 by a connecting-rod 124 from a crank-pin 125 on a disk 126 on a shaft 127, driven by miter-gear 128 from the shaft 12. (See Figs. 1, 2, 3, and 12.) In the seventh position nothing happens; but in the eighth position a device is shown for inserting a card printed, say, with an advertisement. (See Figs. 13 and 16.) 129 is a hopper containing the cards and open at the bottom, beneath which is a slide 130, moved to and fro in guides 131 by an arm 132, pivoted at 133 and linked by a link 134 to a crank-pin 135 on a disk 136, fast on a shaft 137, driven by miter-gear from a vertical shaft 138, which is itself driven by miter-gear 139 from the shaft 12. This slide has a shoulder 140 upon it which engages the lowest card and carries it forward over the former 51, into which it falls when the slide moves back, a spring-lip 141 on the hopper 129 preventing the card following the backward movement of the slide. At the ninth position the former 51 is raised from the bag, as already stated; but in order to hold the material down while it is so raised a spring-plunger 142 (see Figs. 3 and 14) descends into the bag. This plunger is capable of slight vertical movement against a spring 421, contained in a spring-box 422, carried by a slide 143, moved in guides 144 by a conecting-rod 145 and crank-pin 146 on a disk 147, fast on the shaft 12. The plunger 142 is so long that it does not get in the way of the former 51 as it rises, and so soon as the former is clear of the bag the plunger rises also. At the tenth position the top of the bag is folded as follows, (see Figs. 15 and 16:) 148 148 are two plates between which the bag is carried by its mold. To the top of these are hinged the folders 149 150, linked by links 151 to rods 152, whose upper ends move in guides 153, while their lower ends are connected to arms 154, rocked on a spindle 155 by two cams 156 on a shaft 157, driven by miter-gear from the shaft 138, the arms 154 being held down onto the cams by springs 158. The inner folder 149 is actuated in advance of the outer folder 150, owing to the setting of the cams. When the bag reaches this tenth position, paper is standing up above the sides and the front and back—viz., above the inner side, the upper portions of d and e, (marked d' and e' in Fig. 4,) above the outer side similar portions, (marked d^2 and e^2,) above the front b, the front top g, and above the back c, the back top h. The folders 149 150 therefore fold the portions d' e' and d^2 e^2, respectively, over onto the card inserted at the eighth position, and two triangular flaps are now left standing up, these flaps being formed of parts of g and h, as shown in Fig. 4. The following flap h is folded down by a blade 159 on a vertical shaft 160, constantly rotated by a sprocket-wheel 161, chain 162, and chain-wheel 163 on the shaft 138, while the leading flap g is folded as the bag moves on by a fixed blade 164 extending to the thirteenth position, so that the tops have quite stuck by the time the bag arrives here, owing to paste having been put on at the dotted line in the back top h (see Fig. 4) by a third paste-wheel, or rather segment of a wheel, 301. (See Fig. 2.) At the thirteenth position a pasted label is put on the top of the bag to further secure it. (See Figs. 2 and 17. This label is cut from a web 165 by a knife 166, to which a rocking movement is given by a link 167, carrying a bowl 168, operated by a cam 169 on the main shaft. The web is drawn off by a feed-link 170, connected to a rocking arm 171, which carries a gripper-jaw and is rocked by a link 172 from an arm 173, rocked by a rod 174 from a crank-pin 175 on a disk 176 on the shaft 35. The web may be printed by a printing-machine 177. After being cut the label is caught by a sucker 178, (on the top of the arm 173,) from which the air is exhausted by a suitable air-pump 179, to which it is connected by a flexible pipe 180. This pump may be conveniently operated by a crank-pin 181 on the wheel 13 on the shaft 14. The sucker carries the label over a pasting-segment 182, fast on the shaft 33, and deposits it on the top of the bag in the thirteenth position, the movement of the pin 181 causing air to be admitted to the sucker at the proper time to release the label. In the fourteenth position the bag is ejected from the mold by a vertical plunger 183 descending upon it. This plunger is pulled down owing to the pressure on a bar 184, connected to the plunger of a roller 185 on a disk 186, fast on a shaft 187, driven by a chain 188 from the main shaft. The bag may be received by a traveling band 189, driven by a pulley on the shaft 187 and passing over a guide-pulley 190.

The weighing-machine shown and described in this specification forms the subject of my Patent No. 756,281, dated April 5, 1904.

What I claim is—

1. In a packeting-machine, the combination of a horizontally-arranged revolving wheel provided with an annular series of molds, a series of vertically-moving hollow formers one for each mold, means for movably supporting the formers on the wheel, means for moving the formers into and out of the molds,

means for feeding a bag-blank to each mold as the wheel revolves, means for folding each blank around a former to provide an open-ended bag, means for filling the bag thus formed, means for closing the bag when filled, and mechanism for moving the wheel step by step to cause it to pause while a blank is being folded, to then advance to the filling position, and to then advance to the top-closing position.

2. In a packeting-machine, the combination of a horizontally-arranged revolving wheel provided with an annular series of molds, a series of vertically-moving hollow formers, one for each mold, means for movably supporting the formers on the wheel, means for moving the formers into and out of the molds, means for feeding a bag-blank to each mold as the wheel revolves, means for folding each blank around a former to produce an open-ended bag in each mold, means for filling the bags, means for closing them when filled, and mechanisms for moving the wheel step by step and for operating the folders, filler and top-closing devices to cause a blank to be formed into a bag in one mold while a bag in another mold is being filled and a bag in a third mold is being closed.

3. In a packeting-machine, the combination of a wheel provided with an annular series of molds, a series of hollow formers, one for each mold, means for movably supporting the formers on the wheel, means for moving the formers into and out of the molds, means for feeding paper blanks, means located at different points around the wheel for folding the blanks around the formers and for closing the package, means for filling the bags while inclosing the formers, and mechanisms for actuating the wheel, folders and filling devices to cause them to fill a bag in one mold while the blank in another mold is being folded and a bag in a third mold is being closed.

4. In a packeting-machine, the combination of a horizontally-arranged revolving wheel provided with an annular series of molds, a series of vertically-moving hollow formers, one for each mold, means for movably supporting the formers on the wheel, means for moving the formers into and out of the molds, means for feeding a bag-blank to each mold as the wheel revolves, means for folding each blank around a former to produce an open-ended bag in each mold, means for filling the bags, a plunger for compressing the filling material in the bag, means for closing the top of the filled bag and mechanisms for moving the wheel step by step and for operating the folders, filler, compressing-plunger and top-closing devices to cause a bag to be formed in one mold while bags in other molds are being filled, having their contained material compressed and are being closed.

5. The combination of a horizontal mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a series of vertically-moving formers one for each mold serving to push a paper blank into the mold and revolving therewith, means for movably supporting the formers, means for lowering the formers into the molds, means for folding the blank to form a bag around a former, and means for raising the former out of the bag while the latter is within the mold.

6. The combination of a horizontal mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a series of vertically-moving hollow formers, one for each mold serving to push a paper blank into the mold and revolving therewith, means for movably supporting the formers and for lowering them into the mold, means for folding the blank to form a bag around a former, means for supplying material to the bag and means for raising the former out of the bag while the latter is still in the mold.

7. The combination of a horizontal mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a vertically-moving hollow former for each mold serving to push a paper blank into the mold and revolving therewith, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the blank to form a bag around a former, means for supplying filling material to the bag, and means for closing the bag.

8. The combination of a horizontal mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, means for drawing off the required length of paper from a web, means for cutting a blank from the web, a hollow former for each mold serving to push a blank into the mold and revolving with the wheel, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the blank to form a bag around a former, means for supplying material to the bag, and means for closing the bag.

9. The combination of a mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a gripper-arm adapted to engage a paper web, means for rocking the arm, a fixed jaw on the arm, a movable jaw coöperating with the fixed jaw, means for reciprocating the movable jaw at the required time, means for cutting a blank from the web, a hollow former for each mold serving to push a blank into the mold, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the blank to form a bag around a former, means for supplying material to the bag, and means for closing the bag.

10. The combination of a horizontal mold-wheel, means for imparting a step-by-step movement thereto, a series of adjustable pairs

of plates depending therefrom, a hollow former for each pair of plates serving to push a paper blank down between the plates, and revolving with the wheel, means for movably supporting the formers and for raising and lowering them, means for folding the blank to form a bag around a former, means for supplying material to the bag, and means for closing the bag.

11. The combination of a mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a hollow former for each mold serving to push a paper blank into the mold and revolving with the wheel, means for movably supporting the formers and for lowering and raising them into and out of the molds in a direction at right angles to the plane of the wheel, folders 65 adapted to fold in the back flaps of the blank, means for rocking these folders, levers adapted to turn down the bottom flaps, means for operating these levers, means for folding in the remainder of the blank to form a bag around a former, means for supplying material to the bag, and means for closing the bag.

12. The combination of a mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a hollow former for each mold serving to push a paper blank into the mold, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the back and bottom flaps of the blank, a circular track on which the bottom of the bag rests, tongues and slots formed in the track and adapted to fold the bottom flaps in between the bottom of the bag and the former, means for folding the front flaps onto the back flaps, means for supplying material to the bag, and means for closing the bag.

13. The combination of a mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, means for drawing off the required length of paper from a web, means for pasting the web, means for cutting a blank from the web, a hollow former for each mold serving to push a blank into the mold and revolving with the wheel, means for movably supporting the formers and for lowering and raising them into and out of the molds in a direction at right angles to the plane of the wheel, means for folding the blank to form a bag around a former, means for supplying material to the bag, and means for closing the bag.

14. The combination of a horizontal mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a vertically-movable hollow former for each mold serving to push a paper blank into the mold and revolving with the wheel, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the blank to form a bag around a former, a weighing-machine adapted to deliver material to the bags so formed, means for operating the weighing-machine every alternate movement of the wheel, and means for closing the bag.

15. The combination of a horizontal mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a vertically-movable hollow former for each mold serving to push a paper blank into the mold and revolving with the wheel, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the blank to form a bag around a former, means for supplying material to the bag, means for packing the material into the bag, and means for closing the bag.

16. The combination of a mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a hollow former for each mold serving to push a paper blank into the mold, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the blank to form a bag around a former, means for supplying material to the bag, a plunger and a series of vertical rods adapted to pack the material in the bag, a bar carrying the plunger and rods, means for reciprocating the bar, and means for closing the bag.

17. The combination of a horizontal mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a vertically-movable hollow former for each mold serving to push a paper blank into the mold and revolving with the wheel, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the blank to form a bag around a former, means for supplying material to the bag, means for inserting a card into the mouth of the bag, and means for closing the bag.

18. The combination of a mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a hollow former for each mold serving to push a paper blank into the mold, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the blank to form a bag around a former, means for supplying material to the bag, a hopper adapted to contain cards, a slide beneath the hopper, means for reciprocating the slide, a shoulder on the slide adapted to engage and carry forward a card, a spring-lip beneath the hopper preventing the return movement of the card, and means for closing the bag.

19. The combination of a horizontal mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a vertically-movable hollow former for each

mold serving to push a paper blank into the mold, and revolving with the wheel, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding a blank to form a bag around a former, means for supplying material to the bag, means for holding down the material while the former is withdrawn from the bag, and means for closing the bag.

20. The combination of a mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a hollow former for each mold serving to push a paper blank into the mold, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding a blank to form a bag around a former, means for supplying material to the bag, pivoted folders 149, 150 adapted to fold the outer portions of the tops, means for turning these folders successively on their pivots, a folding-blade 159, means for rotating it, and a fixed blade adapted to fold down the last flap to close the bag, substantially as described.

21. The combination of a horizontal mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a vertically-movable hollow former for each mold serving to push a paper blank into the mold and revolving with the wheel, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the blank to form a bag around a former, means for supplying material to the bag, means for folding the top of the bag, and means for depositing a pasted label on the bag.

22. The combination of a mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a hollow former for each mold serving to push a paper blank into the mold, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the blank to form a bag around a former, means for supplying material to the bag, means for closing the bag, means for drawing off a length of paper from a web, means for pasting the web, means for cutting a label from the web, a pneumatic sucker adapted to deposit the label on the top of the bag, and means for exhausting air from the sucker.

23. The combination of a horizontal mold-wheel, means for imparting a step-by-step movement thereto, a series of molds therein, a vertically-movable hollow former for each mold serving to push a paper blank into the mold and revolving with the wheel, means for movably supporting the formers and for lowering and raising them into and out of the molds, means for folding the blank to form a bag around a former, means for supplying material to the bag, means for closing the bag, and means for ejecting the closed bag from the mold.

EDWARD THOMAS POLLARD.

Witnesses:
EMIL SCHOEMANN,
ROBERT B. RANSFORD.