No. 803,017. PATENTED OCT. 31, 1905.

J. C. PALMER.

CONFECTIONERY MACHINE.

APPLICATION FILED JULY 30, 1904.

8 SHEETS—SHEET 1.

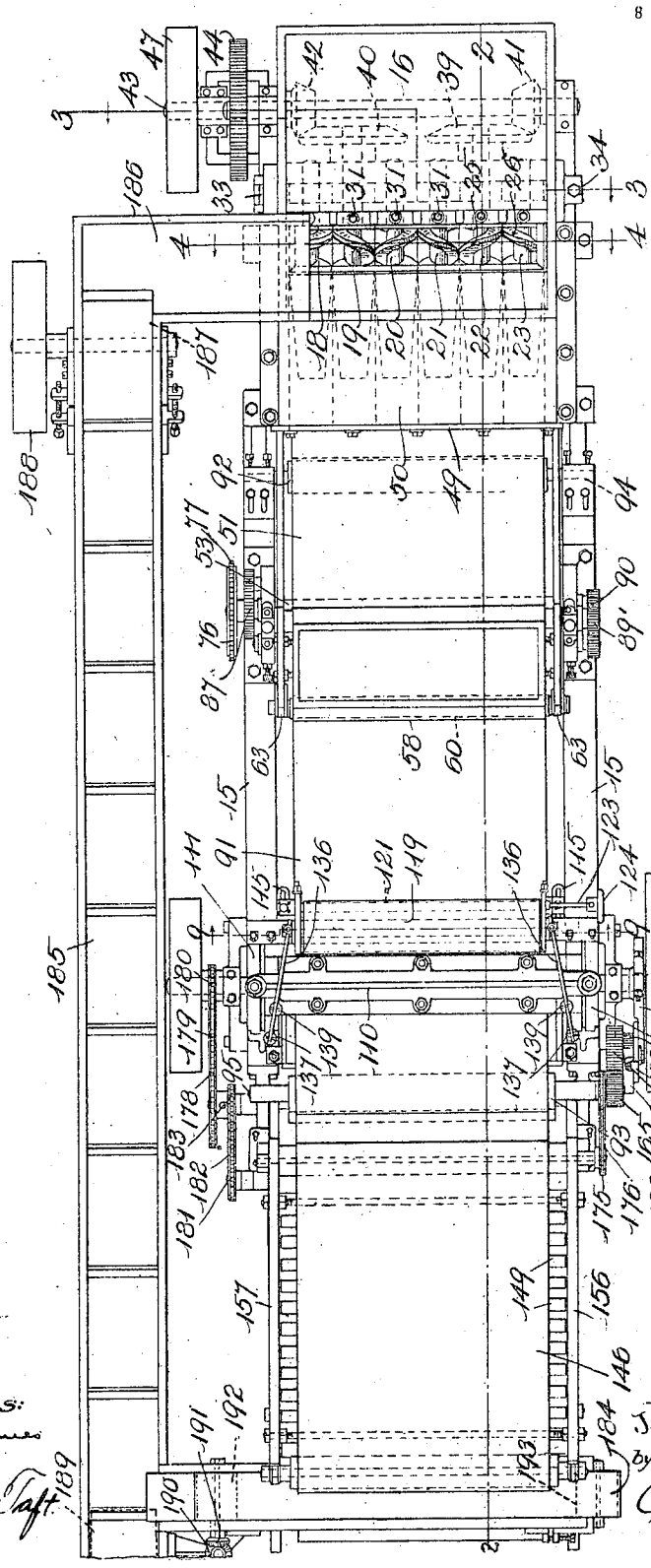

Fig. 1.

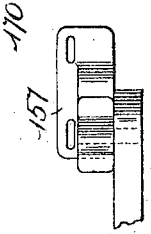

Fig. 1a.

Witnesses:
Louis A. Jones
Sydney E. Taft.

Inventor:
John C. Palmer
by his Att'y.
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8 SHEETS—SHEET 2.

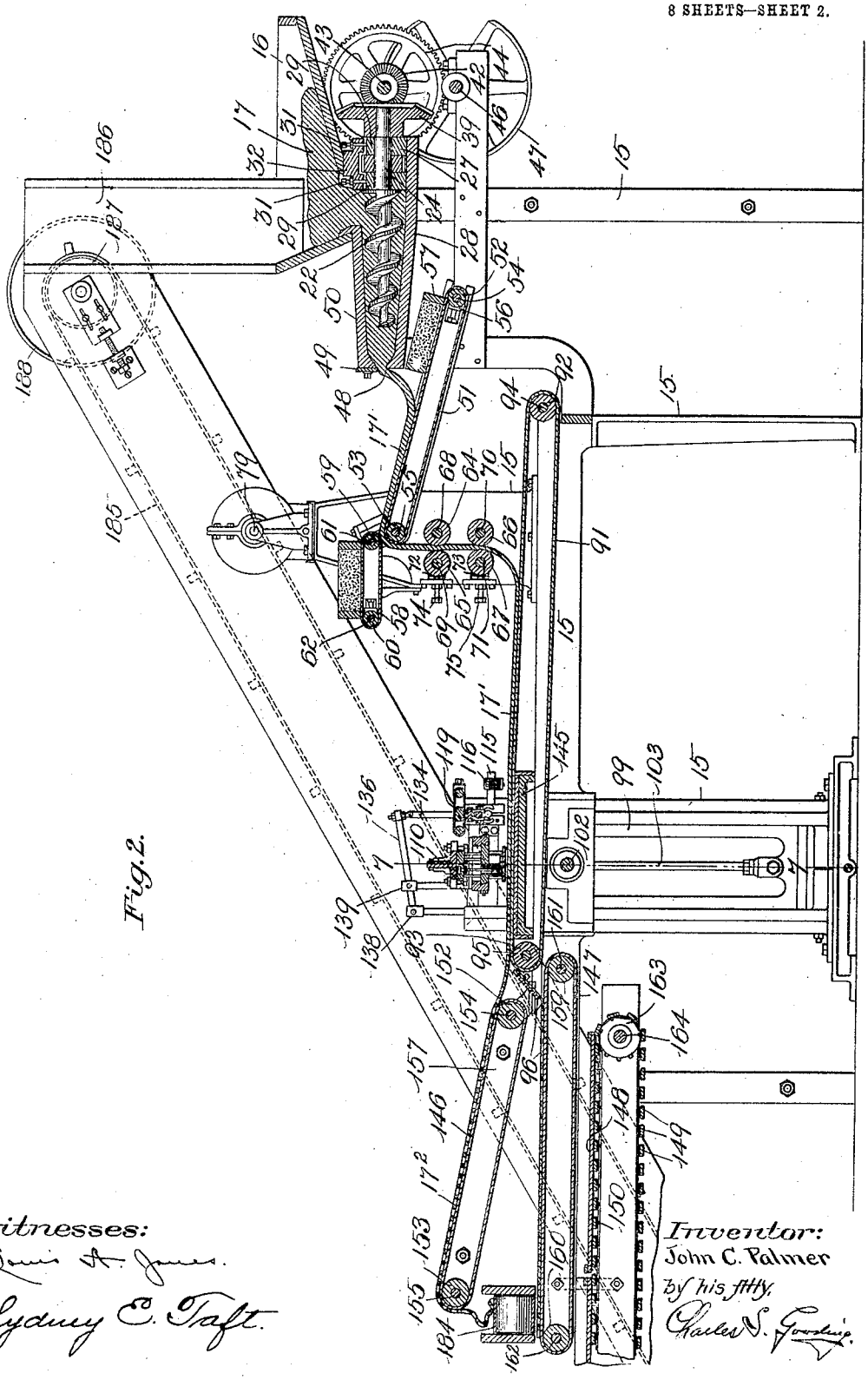

Fig. 2.

Witnesses:

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Sydney E. Taft.

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Charles S. Goodwin.

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8 SHEETS—SHEET 3.

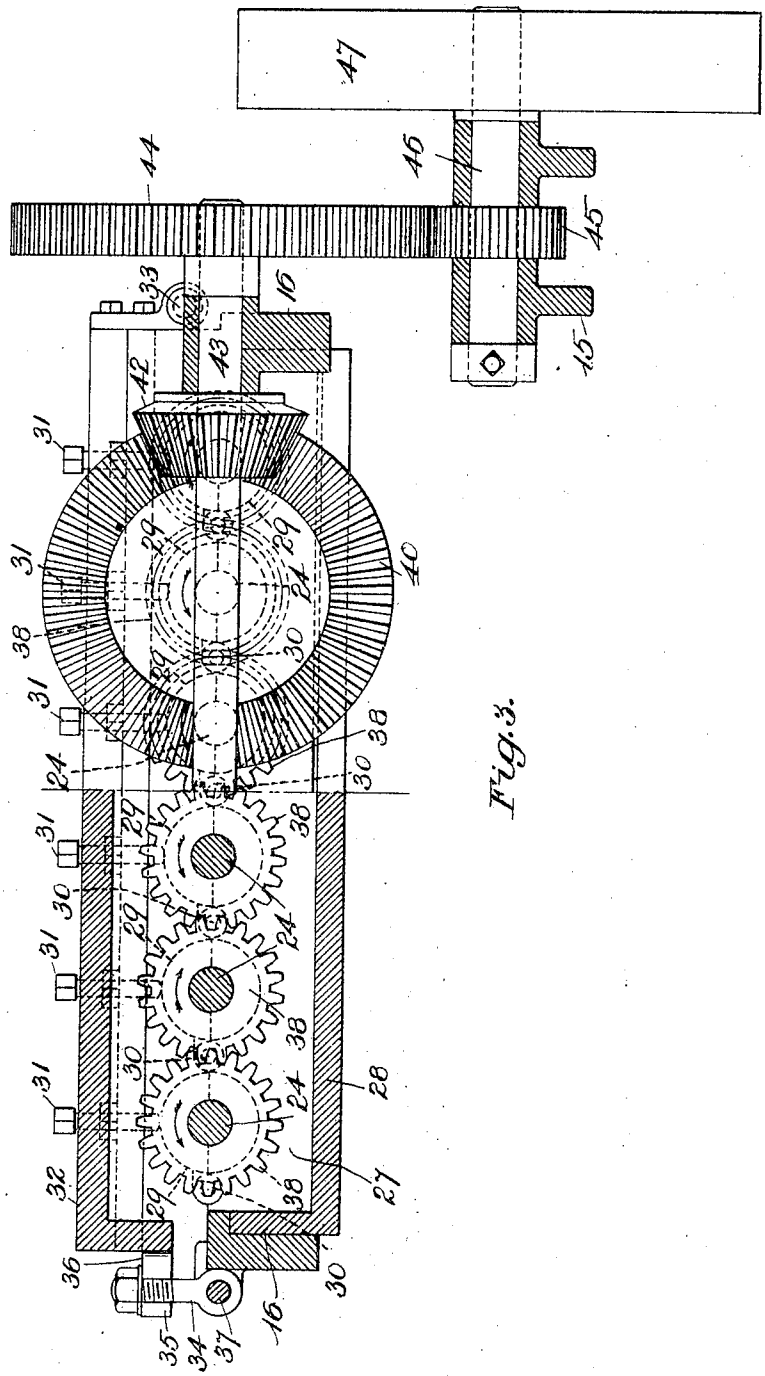

Fig. 3.

Witnesses:
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8 SHEETS—SHEET 4.

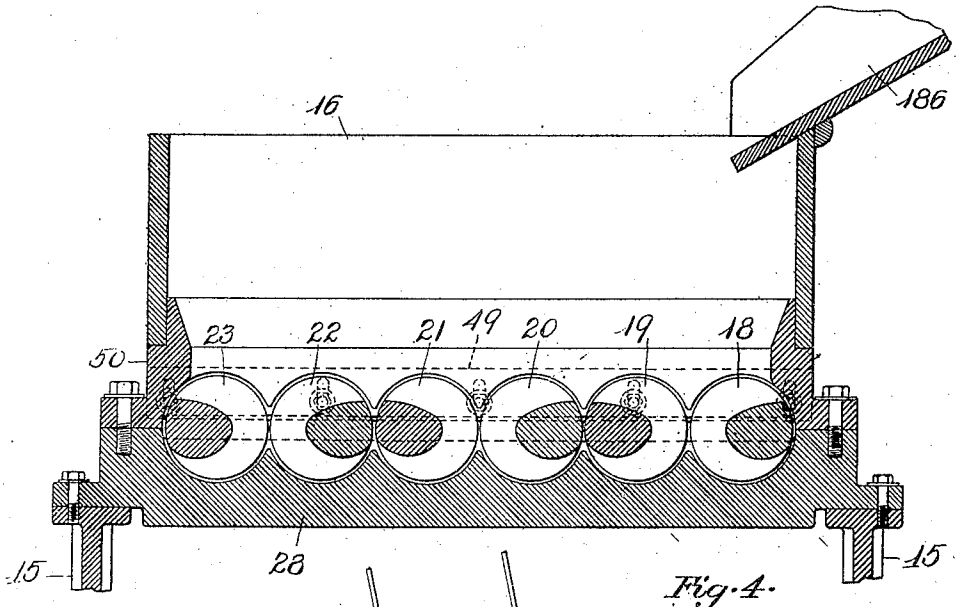

Fig. 4.

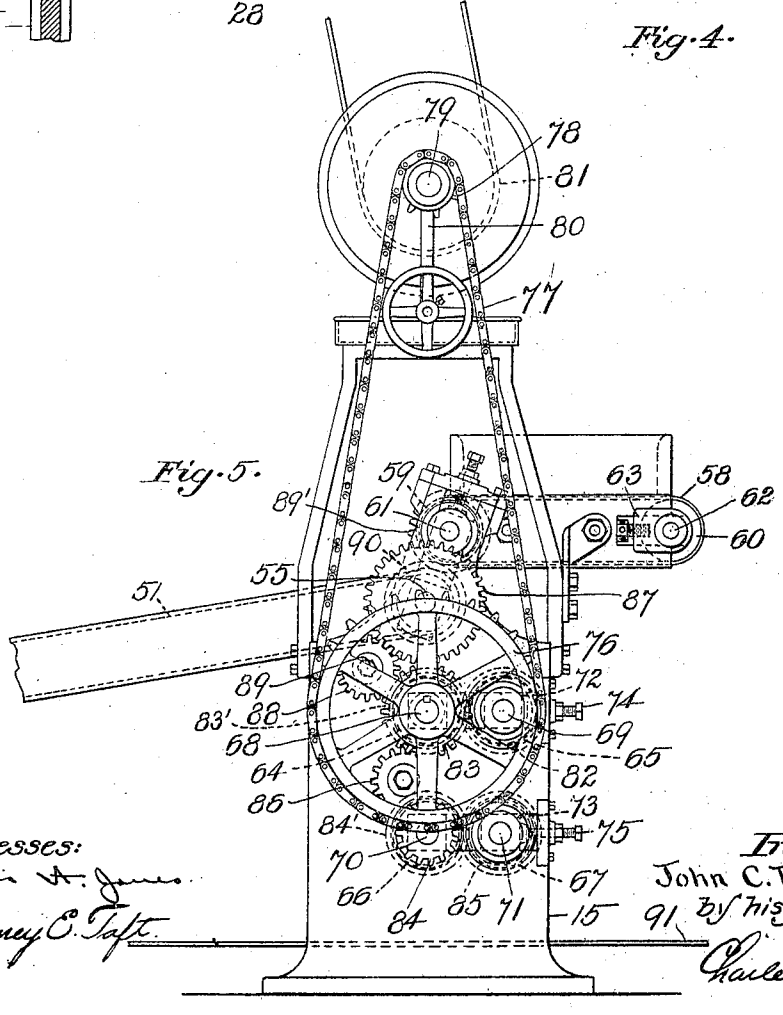

Fig. 5.

Witnesses:
Louis A. Jones.
Sydney C. Taft.

Inventor:
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8 SHEETS—SHEET 5.

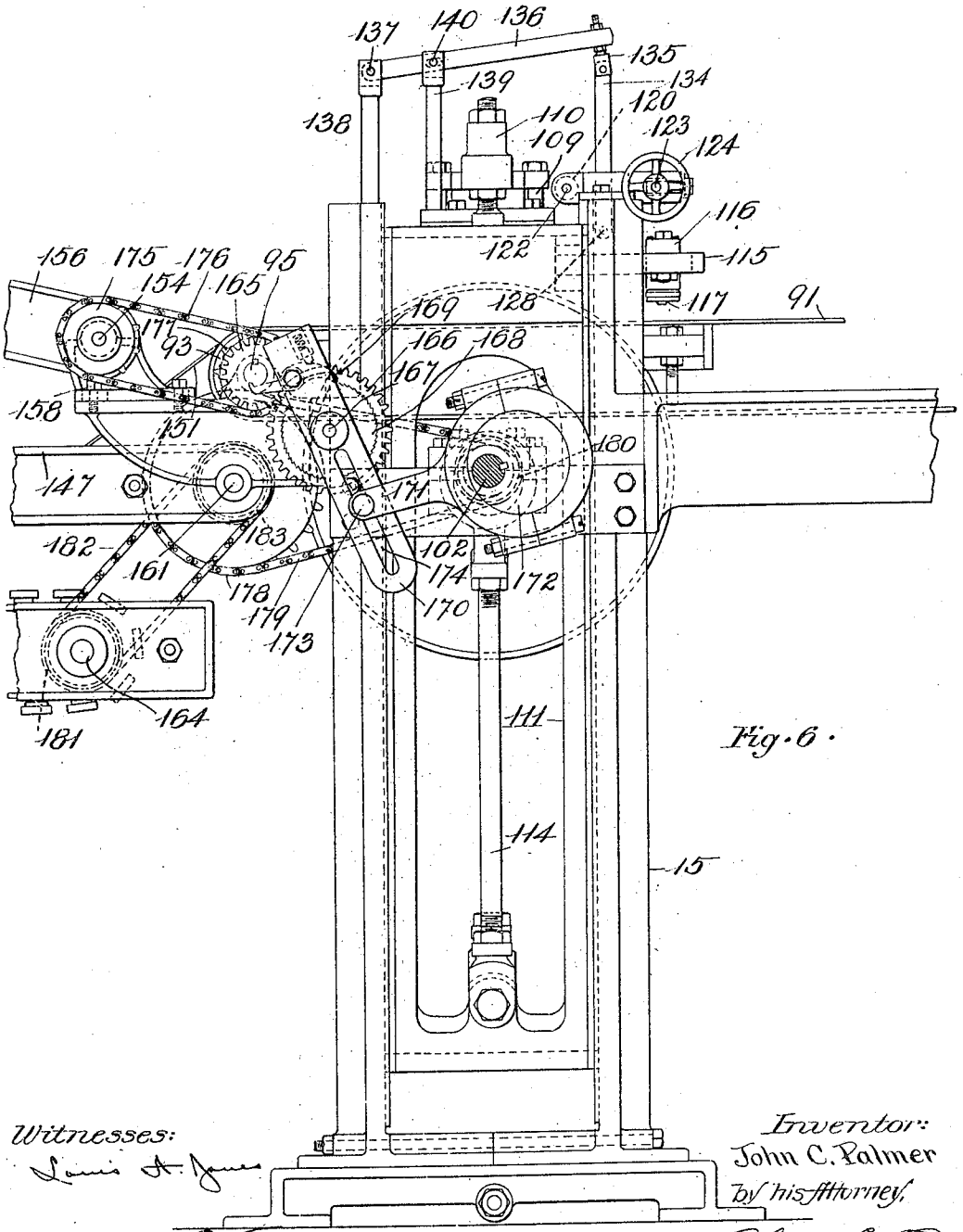

Fig. 6.

Witnesses:

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Inventor:

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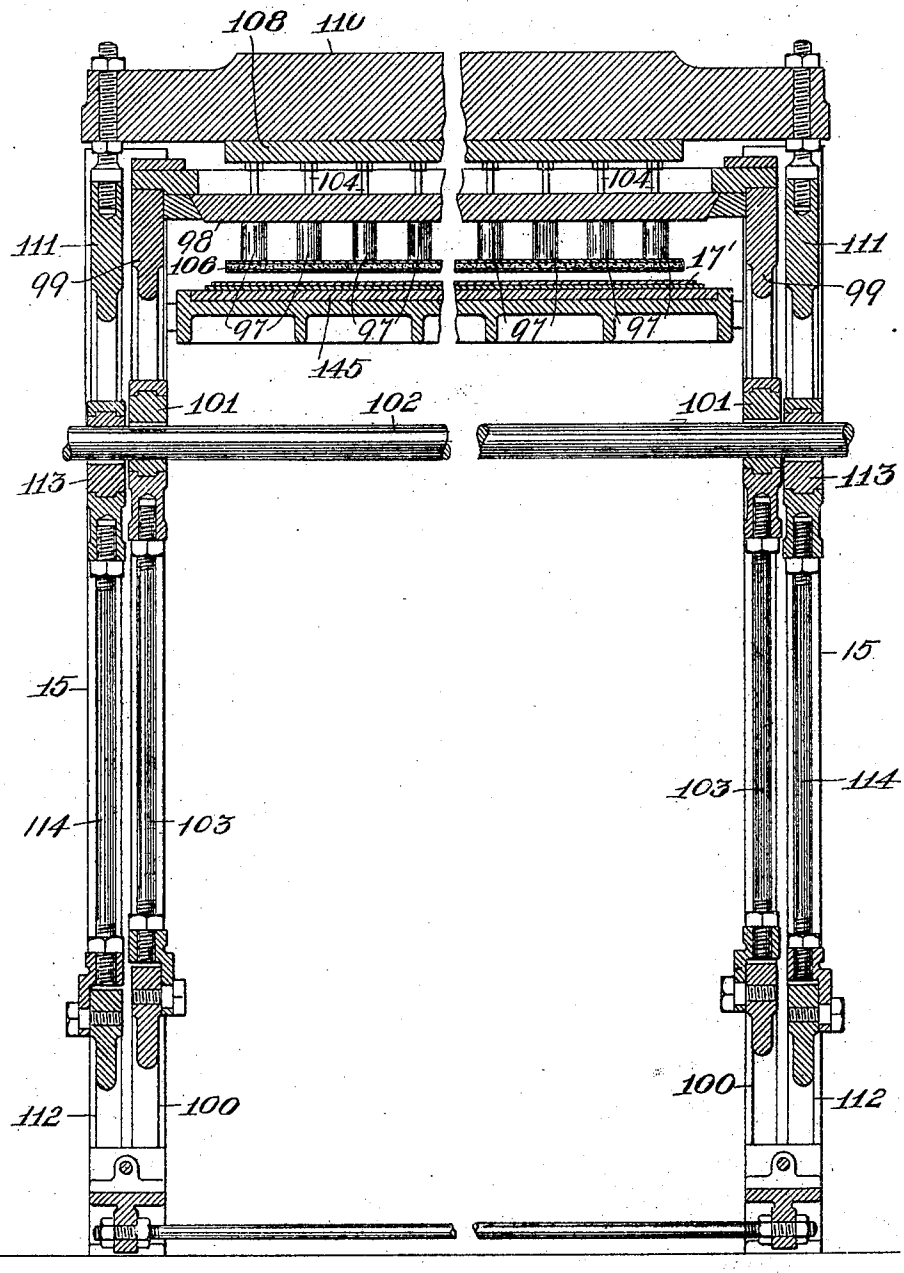
8 SHEETS—SHEET 6.



Witnesses:
Louis A. Jones
Sydney E. Taft.

Fig. 7.

Inventor:
John C. Palmer
by his Attorney, Charles D. Gooding

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

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8 SHEETS—SHEET 7.

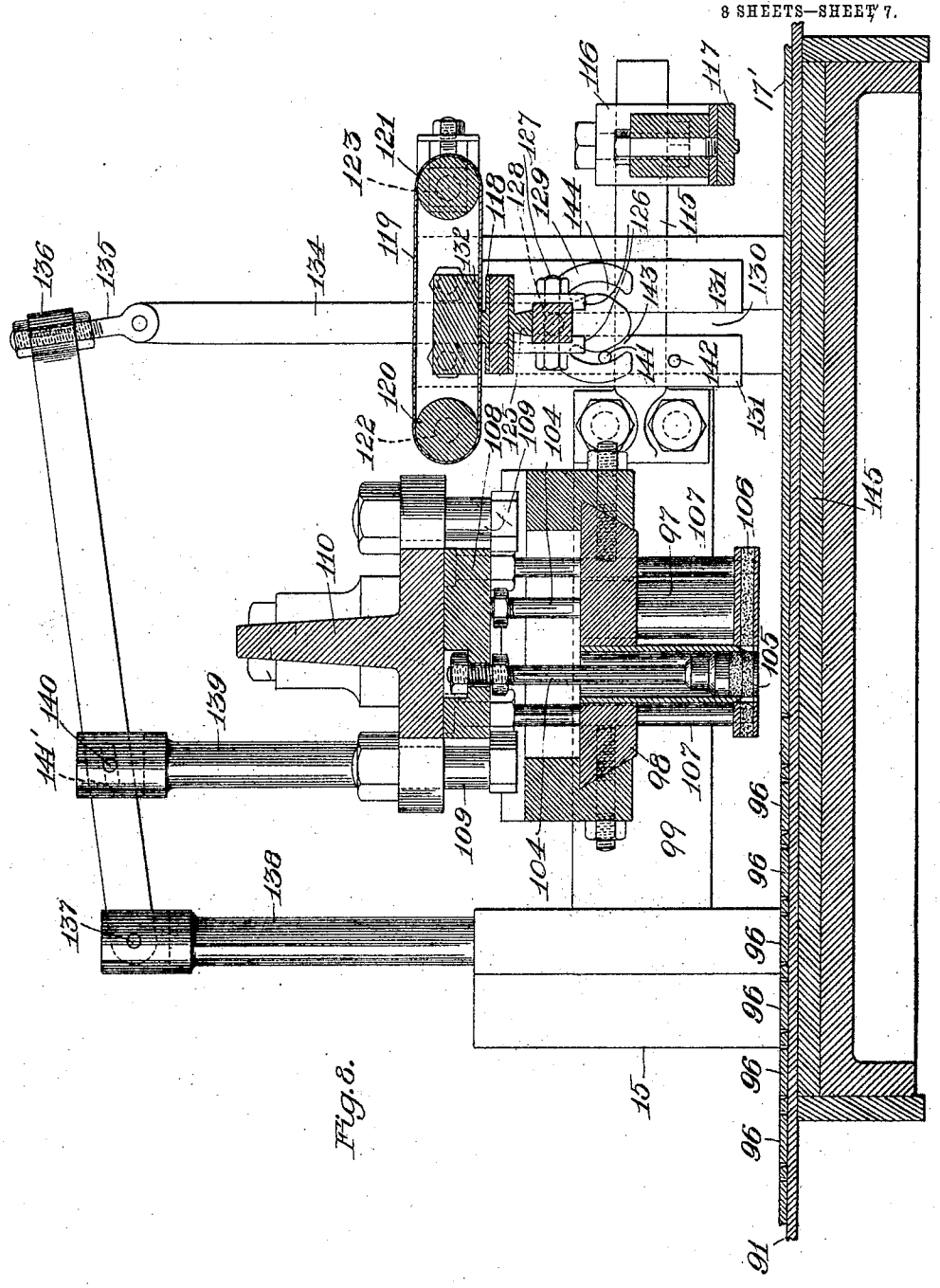

Fig. 8.

Witnesses:
Louis A. Jones
Sydney C. Tafft.

Inventor:
John C. Palmer
by his Attorney, Charles N. Goodwin

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

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8 SHEETS—SHEET 8.

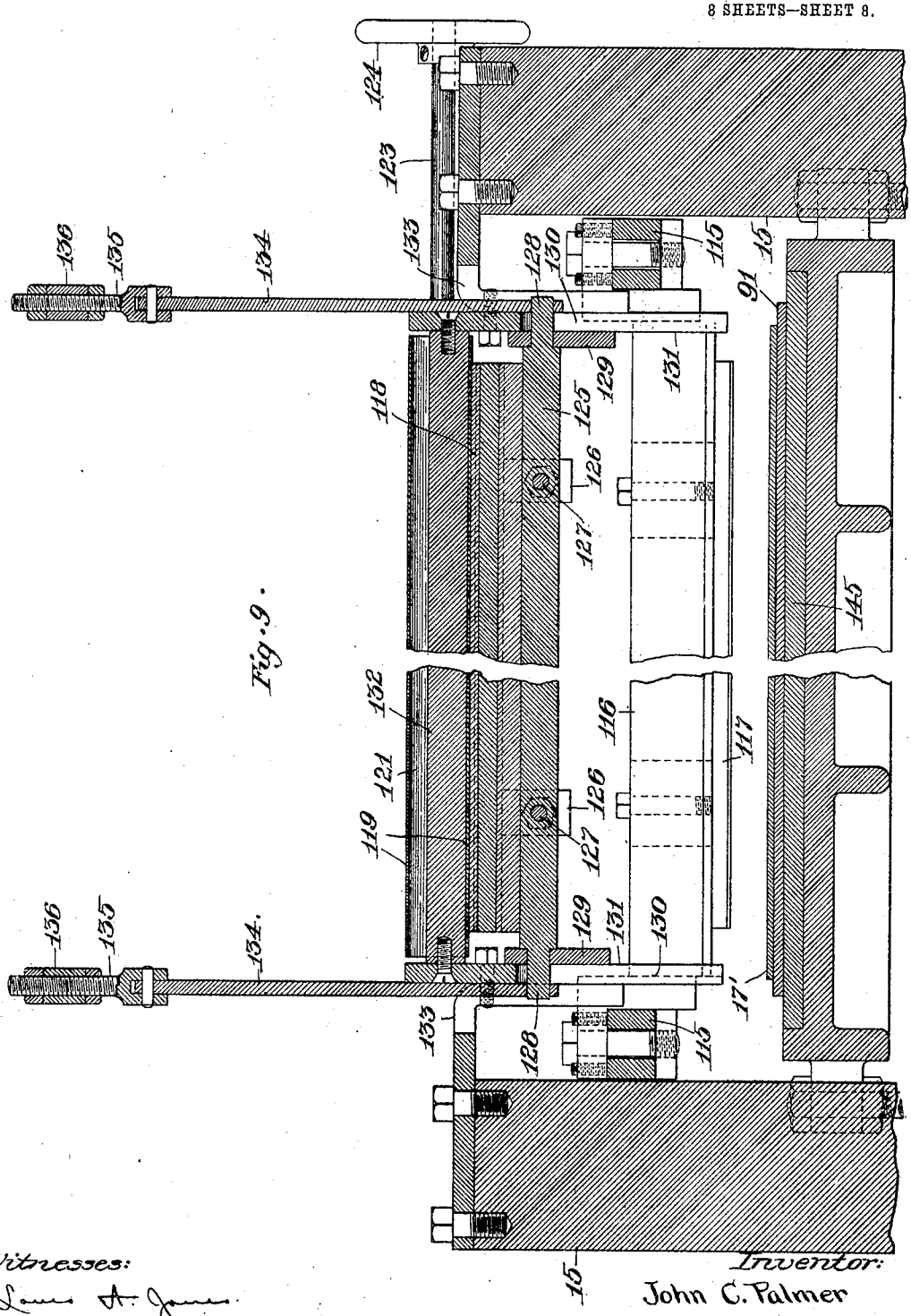

Fig. 9.

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN C. PALMER, OF DORCHESTER, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO GEORGE P. ANDERSON, OF MELROSE, MASSACHUSETTS.

CONFECTIONERY-MACHINE.

No. 803,017. Specification of Letters Patent. Patented Oct. 31, 1905.

Application filed July 30, 1904. Serial No. 218,896.

To all whom it may concern:

Be it known that I, JOHN C. PALMER, a citizen of the United States, residing at Dorchester, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Confectionery-Machines, of which the following is a specification.

This invention relates to a confectionery-machine for the manufacture of lozenges and the like, the object of the invention being to provide a rapid and efficient machine whereby confectionery-paste is thoroughly mixed in a hopper, fed forward in sheet form through an adjustable slot at one end of said hopper, and powdered upon its opposite surfaces to keep it from sticking to the different mechanisms with which said paste contacts during its progress through the machine, said paste being then passed between feed-rolls which regulate the thickness of the sheet as may be desired, thence passing to an embossing or printing device, and then to a cutting mechanism, whereby lozenges of the desired shape are cut from said sheet of paste. The lozenges are then separated by appropriate mechanism from the sheet, and the perforated sheet is carried by an endless belt to a transverse endless belt and by said transverse belt is dumped upon an elevator-belt, which returns the waste to the mixing-hopper, to be again carried through the machine, together with new material.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings, Figure 1 is a plan view of my improved confectionery-machine, partly broken away to save space in the drawings. Fig. 1ª is a plan view of a portion of the bracket 157. Fig. 2 is a longitudinal section, partly in elevation, taken on line 2 2 of Fig. 1. Fig. 3 is a section, partly in elevation, taken on the line 3 3 of Fig. 1 looking toward the left in said figure. Fig. 4 is a section, partly in elevation, taken on line 4 4 of Fig. 1 looking toward the left in said figure. Fig. 5 is an enlarged rear elevation of the mechanism by means of which the feed-rolls and belts for applying powder to opposite surfaces of the confectionery-paste are actuated. Fig. 6 is a front elevation of the cutting and printing mechanism, together with a portion of the conveyer-belts and the mechanism by which they are actuated. Fig. 7 is a detail section, partly in elevation, taken on line 7 7 of Fig. 2, illustrating the cutting mechanism. Fig. 8 is an enlarged section through the cutting mechanism, taken on line 2 2 of Fig. 1. Fig. 9 is an enlarged section, partly in elevation, taken on line 9 9 of Fig. 1 looking toward the left in said figure.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, referring particularly to Figs. 1 and 2, 15 is the main frame of my improved confectionery-machine, and 16 is a hopper adapted to contain confectionery-paste 17. A series of rotary mixers 18, 19, 20, 21, 22, and 23 are located in the bottom of the hopper 16. Each of said mixers comprises in its construction a rotary shaft 24, with a helical mixing-blade fast thereto, said mixing-blades forming alternately right and left hand helices 25 and 26, respectively. The shafts 24 of said rotary mixers are each journaled at one end thereof in a frame 27, Figs. 2 and 3, fast to the bottom 28 of the hopper 16. A journal-cap 29 is supplied for each of the shafts 24, and each of said journal-caps is pivoted at 30 30 to the frame 27. The caps 29 are held in position by binding-screws 31 31, which bear against the top of said caps and have screw-threaded engagement with a locking-cap 32, which extends across and above said journal-caps and is pivoted at one end thereof at 33 to the hopper 16 and at the opposite end thereof is fastened by a bolt 34 to the hopper 16. The bolt 34 projects through a slot 35, formed in an ear 36, integral with the locking-cap 32, and is pivoted at 37 to an ear formed upon the hopper-frame 16, the object of this construction being so that by loosening the nut upon the bolt 34 and tipping said bolt upon its pivot 37 the locking-cap 32 may be tipped upon its pivot 33 and all of the journal-caps 29 thus disengaged from the binding-screws 31, so that said journal-caps may be tipped upon their respective pivots and the mixers removed from the hopper for the purpose of cleansing the same. Each of the mixer-shafts has a spur-gear 38 fast thereto, said gears meshing into each other. Two of said shafts 24 have fast thereto bevel-gears 39 and 40,

which mesh into bevel-gears 41 and 42, respectively, fast to a shaft 43, journaled in the hopper-frame 16 and rotated by a gear 44, fast thereto and meshing into a pinion 45, said pinion 45 being in turn fastened to a driving-shaft 46, journaled in the frame 15 and driven by a pulley 47, fast thereto.

The confectionery-paste is thoroughly mixed in the hopper 16 by the rotary mixers and is forced from the hopper by said mixers through an orifice 48, provided in the front end of said hopper, extending entirely thereacross adjacent to the outer ends of said mixers. A plate 49 is adjustably fastened to the top 50 of the hopper 16 and affords a convenient means for adjusting the height of the orifice or slot 48 to regulate to a certain degree the thickness of the sheet of confectionery-paste formed by the mixers forcing said confectionery-paste through said orifice. In practice it has been found that said rotary mixers perform the best work and secure the best results by making the periphery of the helical blades of said mixers of the same radius for preferably two convolutions of said helical blade from the base thereof and then so forming said helical blade that the periphery thereof converges toward the axial line of the shaft 24 of said mixers, so that the periphery of each helical mixing-blade lies in a cylindrical surface parallel to and concentric with the axial line of said shaft for a portion of its length and then converges toward said axial line, lying substantially in a frusto-conical surface, also concentric with said axial line. The top 50 and bottom 28 of said hopper 16 are preferably formed to substantially follow the outer periphery of said helical blades, said top and bottom being adjacent to the top and bottom of said mixing-blades and converging toward each other as they approach the outlet-orifice 48.

It will be understood that the confectionery-paste after passing out of the hopper 16 is in the form of a continuous sheet and passes from said hopper downwardly upon an endless belt 51, driven by rolls 52 53, fast to shafts 54 and 55, respectively. The shaft 54 is journaled in boxes 56, adjustably fastened to the frame 15, while the shaft 55 is journaled in said frame 15. The belt 51 passes beneath a receptacle 57, supported upon the frame 15, and as said belt passes beneath the sheet of confectionery-paste 17′ it transfers starch-powder from the receptacle 57 to the under side of said confectionery-paste sheet. Powder is also applied to the upper surface of said sheet by an endless belt 58, driven by rolls 59 and 60, fast, respectively, to shafts 61 and 62, the shaft 61 being journaled in the frame 15 of the machine, while the shaft 62 is journaled in boxes 63, adjustably fastened to said frame 15.

By reference to Fig. 2 it will be seen that the paste in sheet form 17′ passes between the rolls 53 and 59 and thence downwardly between two pairs of feed-rolls 64 65 and 66 67. The rolls 64 and 65 are fastened to shafts 68 and 69, respectively, while the rolls 66 and 67 are fast to shafts 70 and 71, respectively. The shafts 68 and 70 are journaled in the frame 15. The shafts 69 and 71 are journaled in boxes 72 and 73, respectively, adjustably fastened to the frame 15, (see Figs. 2 and 5,) said boxes being moved, together with the rolls journaled therein, toward or away from the shaft 68 and 70 by adjusting-serews 74 and 75, respectively. Thus by adjusting the rolls 65 and 67 toward or away from the rolls 64 and 66, respectively, the thickness of the sheet of paste may be regulated as may be desired. The shaft 68 has fast to the rear end thereof, as illustrated in Figs. 1 and 5, a sprocket-gear 76, by which said shaft is rotated, the sprocket 76 being rotated by a sprocket-chain 77, which is driven by a sprocket-gear 78, fast to a shaft 79, journaled in a bracket 80 and rotated by a pulley 81, fast thereto. The pulley 81, shaft 79, and supporting-bracket 80 are illustrated in Fig. 5, but are removed from Fig. 1 for the purpose of more clearly illustrating the mechanism located therebeneath. The shaft 69, together with the roll 65, fast thereto, is rotated by a gear 82, fast to said shaft 69 and meshing into a gear 83′, fast to the shaft 68.

The shafts 70 and 71 together, with their respective feed-rolls, are rotated by gears 84 and 85, respectively, the gear 84 being rotated by an intermediate gear 86, driven by the gear 83. The shaft 55, together with its roll 53, is rotated by a gear 87, fast to said shaft 55 and meshing into an intermediate gear 88, journaled upon a stud 89, fast to the frame 15, said gear 88 being driven by the gear 83. The shaft 61 is rotated by a gear 89′, fast thereto and meshing into a gear 90, fast to the shaft 55. The gears 83 and 83′ and the gears 84 84′ are fast, respectively, to opposite ends of the shafts 68 and 70.

It will be noted that the rolls 64 and 65 rotate at greater speed than the rolls 53 and 59 and that the rolls 66 and 67 rotate at greater speed than the rolls 64 and 65, thus assisting in the feeding and drawing out of the paste-sheet 17′ as it passes between said rolls. The difference in speed of the rolls is obtained by proper proportion of the relative diameters of the gears, the gear 83 being greater in diameter than the gear 84 and less in diameter than the gear 87.

After the paste-sheet 17′ has passed through the feeding and regulating rolls 66 and 67 it is carried by an endless belt 91, Figs. 2 and 6, to the embossing, printing, and cutting mechanism. The endless belt 91 is driven by rolls 92 and 93, fast to shafts 94 and 95, respectively, said shafts being journaled in the frame 15 of the machine. The lozenges 96 of any desired shape are cut from the sheet 17′ by a

series of hollow cutters 97, Figs. 2 and 8. Said cutters are fast to the head 98, which is adjustably fastened to a slide 99, guided in ways 100, formed in the frame 15 of the machine. A vertical reciprocatory motion is imparted to the slide 99, Fig. 7, by eccentrics 101, fast to a shaft 102, journaled in the frame 15, said eccentrics being connected to the slide 99 by eccentric-rods 103. In the interior of each of the hollow cutters 97 is located a piston 104, having fast to its lower end a cleaning-pad 105, forming a piston-packing which serves to keep the interior of said cutter clean. The outside of said cutter is kept clean by a pad 106, fastened by bolts 107 to a plate 108. The piston 104 is also fastened to said plate. The plate 108 is detachably fastened by clamp-bolts 109 to a cross-head 110, fast to and forming, in effect, a part of the slide 111. The slide 111 is guided in ways 112 in the frame 15 and has a vertical reciprocatory motion imparted thereto by eccentrics 113, fast to the shaft 102 and connected to said slide 111 by connecting-rods 114, Fig. 7.

The cutter-slide 99 has fastened thereto arms 115, Fig. 8, to which is attached a cross-head 116, having dies 117 fast thereto, by means of which figures, letters, or characters of any desired form may be embossed in the upper surface of the paste-sheet 17′ when the slide 99 has lowered, as hereinbefore described, until said dies contact with the upper surface of the sheet 17′. When it is desired to print upon the upper surface of the sheet 17′, a printing-pad 118, Figs. 8 and 9, is employed. Said pad is illustrated in said figures in an inverted position in contact with an inking ribbon or belt 119, driven by rolls 120 and 121, fast, respectively, to shafts 122 and 123, journaled in the side frames of the machine, the roll 121 being adjustable to take up slack in the ribbon 119 and rotated by means of a hand-wheel 124, fast to the shaft 123. The pad 118 is fast to a rocking frame 125 by means of clamp-plates 126 and bolts 127, and said rocking frame is provided at opposite ends thereof, Fig. 9, with cylindrical arms 128. To each of said arms is fastened a slotted cam-plate 129. The cylindrical arms 128 each project through a slot 130, formed in guide-plates 131, fast to the impression-bar 132. Said guide-plates are rigidly fastened to brackets 133, fast to and forming, in effect, a portion of the frame 15 of the machine. A vertical reciprocatory motion is imparted to the pad 118, rocking frame 125, and cams 129 by links 134, pivotally connected at their opposite ends, respectively, to the cylindrical arms 128, at the lower end thereof, and at the upper end thereof to eyebolts 135, adjustably fastened to levers 136, said levers in turn being pivoted at 137 to standards 138, fast to the frame 15. A rocking motion is imparted to the levers 136 by standards 139, fast to the reciprocatory slide 99, said levers being connected to the standards 139 by pins 140, fast to said standards and projecting through slots 141′, formed in said levers 136.

The operation of the printing device is as follows: A vertical rocking movement is imparted to the levers 136 by the standards 139 and reciprocatory slide 99, to which said standards are fastened. The links 134 impart a reciprocatory movement from the lever 136 to the rocking frame 125. Said rocking frame in its vertical reciprocatory motion carries the cams 129 downwardly therewith from the position shown in Fig. 8, and as said cams descend they are rotated, together with the rocking frame 125 and the printing-pad 118, by stationary pins 141 and 142, which enter the cam-slots 143 and 144, respectively, as the rocking frame 125 descends, thus inverting the printing-pad from the position shown in Fig. 8 to a position at one hundred and eighty degrees therefrom and in position to transfer the ink from said printing-pad to the upper surface of the sheet 17′. When the slide 99 moves upwardly, said printing-pad 118, rocking frame 125, and cams 129 will be returned to the position illustrated in Fig. 8 to apply fresh ink to the face of the type upon said printing-pad.

The operation of the cutters 97 and pistons 104 is as follows: Assuming the parts to be in the position illustrated in Fig. 8, the slide 99 descends, carrying the cutters therewith through the pad 106 and below the pad 105, thus cleaning the outer and inner surfaces of said hollow cutters. When said slide has descended to a sufficient distance, the lower cutting edge of the cutter perforates the sheet 17′. During this downward motion of the cutters the slide 111 has been moving upwardly, carrying with it the pistons 104 and pads 105 and 106. When the cutters start to move upwardly, the slide 111 moves downwardly, compressing the air in the interior of the hollow cutters 97 and holding the cut lozenges downwardly against the belt 91 and supporting-table 145. After the sheet has been printed and the lozenges cut therefrom said sheet is fed forward toward the left, Fig. 2, by the belt 91, the cut portion of said sheet passing onto an endless belt 146 and the lozenges 96 dropping out of said sheet upon another endless belt 147. Said lozenges travel with the belt 147 toward the left, Fig. 2, and drop from said belt upon boards 148, placed upon slats 149, fast to endless chains 150. An inclined plate 151 extends from the upper left-hand end of the belt 91 downwardly toward the upper surface of the endless belt 147 and forms a guide for the lozenges as they drop out of the perforated sheet to conduct said lozenges to the belt 147.

The endless belt 146 is actuated by the rolls 152 and 153, fast, respectively, to shafts 154 and 155, journaled in brackets 156 and 157. The brackets 156 and 157 are made adjustable

upon the frame 15, Fig. 1ª, in order that the space between the rolls 95 and 152, and consequently between the adjacent ends of the belts 146 and 91, may be increased or diminished, as may be desired, the purpose of this adjustment of space being to adapt the machine for use with different thicknesses and consistencies of paste-sheets. It is desirable that the paste-sheet as it passes from the belt 91 to the belt 146 should curve down slightly, and thus assist in the ejection of the lozenges therefrom upon the inclined plate 151; but it is undesirable that there should be too much slack of the sheet between said belts 146 and 91, and therefore the adjustment of the brackets 156 and 157, together with the belt 146, carried thereby, is provided. The belt 147 is actuated by means of rolls 159 and 160, fast, respectively, to the shafts 161 and 162, journaled in the side frames 15 of the machine.

The chains 150, together with the slats 149 fast thereto and the boards 148, supported upon said slats, are moved toward the left by a roll 163, fast to a shaft 164, journaled in the side frame of the machine, and by another roll and shaft, similar thereto, but not shown on the drawings.

The shaft 95 is rotated by means of a gear 165, fast thereto and meshing into a gear 166, journaled upon a stud 167, fast to the frame 15, Fig. 6. A rotary motion is imparted to the gear 166 by a ratchet 168 and pawl 169. The pawl 169 is pivoted to a lever 170, said lever being pivoted upon the stud 167 and having a rocking motion imparted thereto by an eccentric-rod 171 and eccentric 172, said eccentric being fastened to the shaft 102. A greater or less movement may be imparted to the ratchet at each rotation of the shaft 102 by moving the stud 173 toward or away from the stud 167 in the slot 174, formed in said lever 170. The shaft 154 is rotated by a sprocket-gear 175, fast thereto and connected by a sprocket-chain 176 to another sprocket-gear 177, fast to the shaft 95. The shaft 161 is rotated by a sprocket-gear 178, fast thereto and connected by a sprocket-chain 179 to a sprocket-gear 180, fast to the shaft 102. The shaft 164 is rotated by a sprocket-gear 181, fast thereto and connected by a sprocket-chain 182 to a sprocket-gear 183, fast to the shaft 161.

The perforated sheet 17^2 passes from the belt 146, Fig. 2, to another endless belt 184, extending transversely of the machine and of the different belts hereinbefore described, and is carried by said belt to an elevator-belt 185 and by said elevator-belt is carried upwardly and dumped into a chute 186, said chute forming a portion of the hopper 16 and leading into the interior thereof, so that the waste material is carried by said endless belt 184, elevator-belt 185, and chute 186 to the interior of the hopper 16. The elevator-belt 185 is driven by a roll 187, which is rotated by means of a pulley 188. The lower end of said elevator-belt passes over a pulley 189, Fig. 1, and said pulley imparts rotary motion to bevel-gears 190 191, and from said bevel-gears rotary motion is imparted to the pulleys 192 and 193, by means of which the transverse belt 184 is actuated.

Having thus specifically described my improved confectionery-machine I will now proceed to describe the general operation thereof.

The confectionery-paste 17 is introduced into the hopper 16 and is thoroughly mixed therein by the mixers 18 to 23 and forced by said mixers through the orifice 48 in the form of a sheet 17′. Said sheet 17′ descends from the orifice 48 upon the surface of the endless belt 51 and is carried by said belt between the rolls 53 and 59 and between the belts 51 and 58, said belts 51 and 58 applying starch powder to the top and bottom, respectively, of said paste-sheet. From the rolls 53 and 59 said paste-sheet passes between the rolls 64 and 65, 66 and 67 and is reduced in thickness as it passes therebetween. Said paste-sheet passes from the rolls 66 and 67 on to the endless belt 91 and is carried by said endless belt beneath the embossing, printing, and cutting mechanisms in the order named, said sheet being embossed or printed, as may be desired, and the lozenges cut from said sheet as hereinbefore described. The perforated sheet, together with the lozenges cut therefrom, passes to the end of the belt 91 at the left thereof, Fig. 2, beyond the cutting mechanism. The lozenges drop out of said perforated sheet as the same passes from the endless belt 91 to the endless belt 146, said lozenges sliding down the inclined plate 151 onto the endless belt 147, while the perforated sheet 17^2 is carried by said endless belt 146 to the endless belt 184 and by said endless belt 184 carried to the elevator-belt 185, said elevator-belt carrying said perforated sheet upwardly, dumping the same into the chute 186, by which it is conducted to the interior of the hopper 16 to be mixed in with added paste for a new supply, to be acted upon as hereinbefore described. The lozenges pass from the endless belt 147 at the left-hand end thereof, Fig. 2, downwardly upon the boards 148, said boards being fed toward the left by the slats 149 and chains 150, and as soon as said boards are filled they are removed from the machine by an attendant.

Having thus described my invention, what I claim, and desire by Letters Patent to secure, is—

1. In a confectionery-machine, mechanism to mix confectionery-paste and form said paste into a continuous sheet, mechanism to cut lozenges from said sheet, an endless carrier-belt for said sheet, a waste-carrier belt in alinement therewith, with a space between the adjacent ends of said belts, the receiving end of said sheet-carrier belt adjacent to said mixing

mechanism, a carrier-belt extending transversely of said waste-carrier belt, with its receiving end adjacent to the delivery end thereof, and an elevator-belt extending parallel to said sheet and waste belts, with its receiving end adjacent to said transverse belt and its delivery end adjacent to said mixing mechanism.

2. In a confectionery-machine, mechanism to mix confectionery-paste and form said paste into a continuous sheet, mechanism to cut lozenges from said sheet, an endless carrier-belt for said sheet, a waste-carrier belt in alinement therewith with a space between the adjacent ends of said belts, the receiving end of said sheet-carrier adjacent to said mixing mechanism, a carrier-belt extending transversely of said waste-carrier belt with its receiving end adjacent to the delivery end thereof, an elevator-belt extending parallel to said sheet and waste belts with its receiving end adjacent to said transverse belt and its delivery end adjacent to said mixing mechanism, and a chute leading from said delivery end of said elevator-belt to said mixing mechanism.

3. In a confectionery-machine, a hopper, a series of mixers in said hopper, said mixers each comprising a shaft with a helical mixing-blade fast thereto, a frame in which one end of each of said shafts is journaled, a journal-cap for each of said shafts pivoted to said frame, and a locking-cap fast to said frame extending across said journal-caps.

4. In a confectionery-machine, a hopper, a series of mixers in said hopper, said mixers each comprising a shaft with a helical mixing-blade fast thereto, a frame in which one end of each of said shafts is journaled, a journal-cap for each of said shafts pivoted to said frame, a locking-cap fast to said frame extending across said journal-caps, and binding-screws in said locking-cap engaging said journal-caps.

5. In a confectionery-machine, a hollow-cutter mechanism to impart a reciprocatory motion thereto, a piston located inside said cutter, mechanism to impart an independent reciprocatory motion to said piston and a cleaning-pad fast to said piston.

6. In a confectionery-machine, a rotary shaft, a vertical slide projecting above and below said shaft, an eccentric fast to said shaft, an eccentric-rod connecting said eccentric to said slide below said shaft, and a hollow cutter fast to said slide above said shaft.

7. In a confectionery-machine, a rotary shaft, two vertical slides projecting above and below said shaft, eccentrics fast to said shaft, eccentric-rods connecting said eccentrics to said shaft, a hollow cutter fast to one of said slides, and a piston located inside said cutter and fast to the other of said slides.

8. In a confectionery-machine, a hopper, mechanism to mix confectionery-paste in said hopper and form said paste into a continuous sheet, mechanism to feed said sheet, mechanism to cut lozenges from said sheet, an endless belt adapted to receive said lozenges, an endless belt adapted to receive said perforated sheet extending longitudinally of said machine, a conveyer-belt extending transversely of said machine, and an elevator-belt extending from said transverse belt to said hopper.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN C. PALMER.

Witnesses:
CHARLES S. GOODING,
ANNIE J. DAILEY.