963,916.

F. A. MEIER.

LOZENGE MAKING MACHINE.

APPLICATION FILED JAN. 28, 1909.

Patented July 12, 1910.

4 SHEETS—SHEET 1.

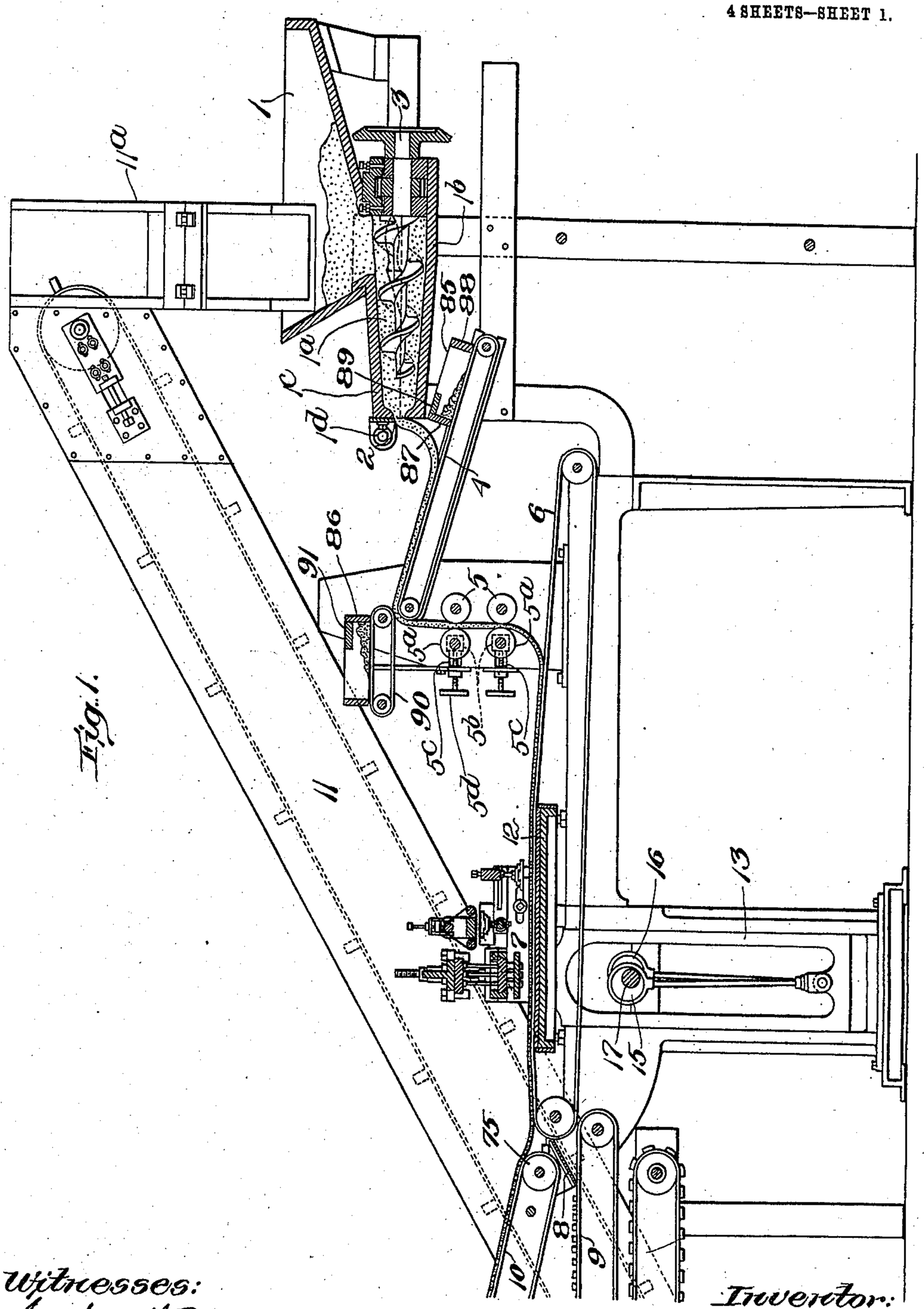

Fig. 1.

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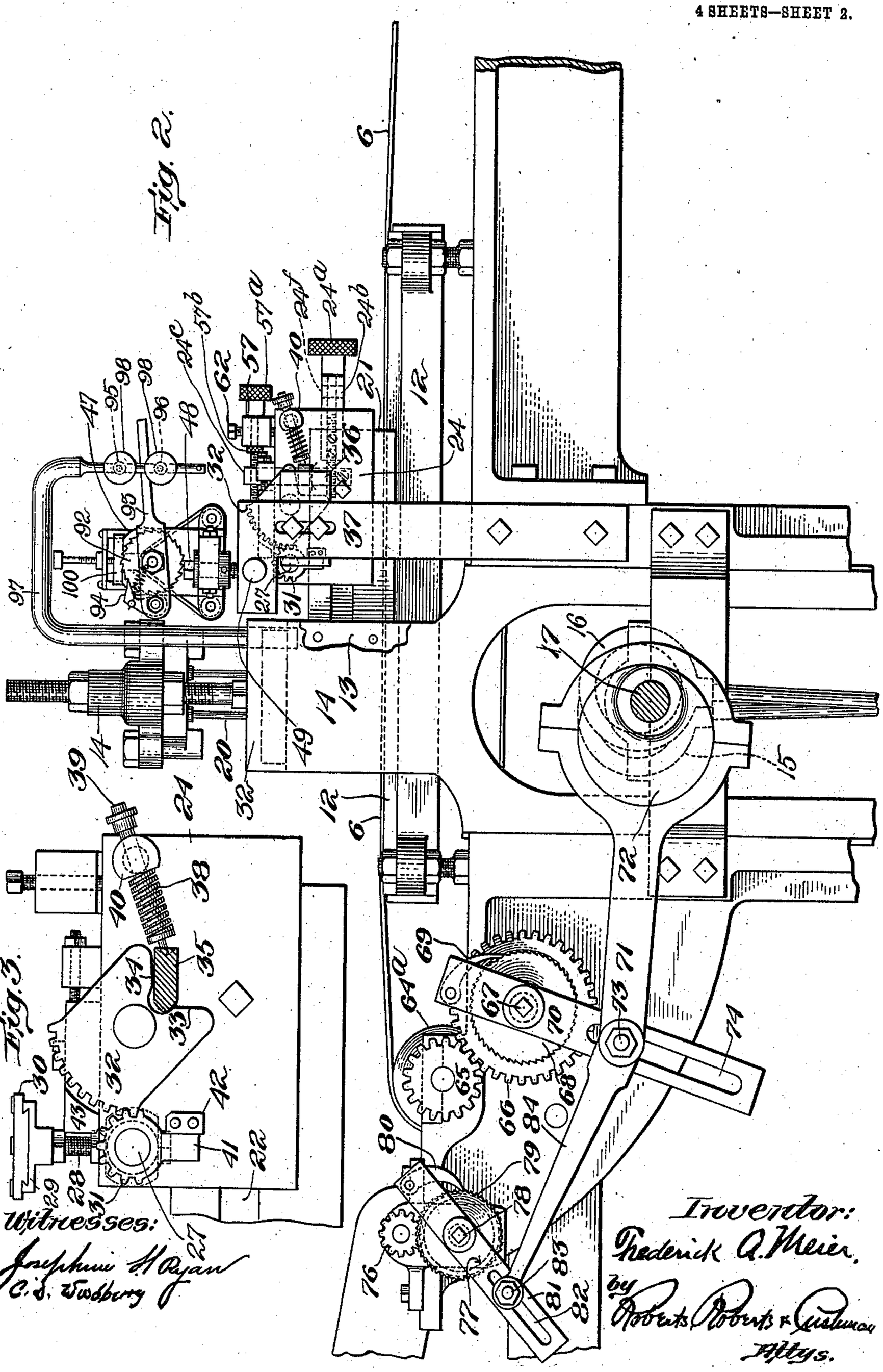
4 SHEETS—SHEET 2.

Fig. 2.



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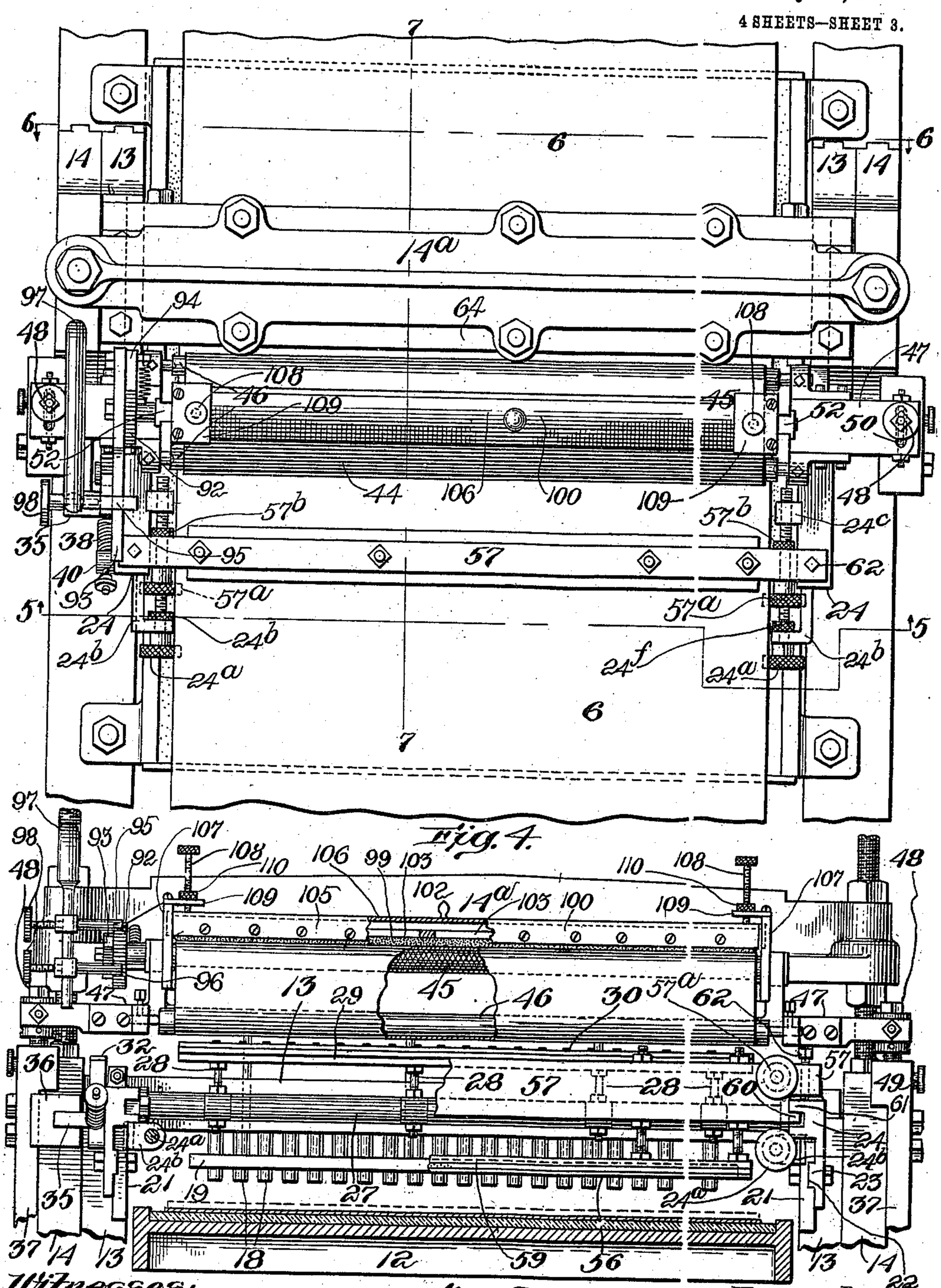

Fig. 4.

Fig. 5.

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4 SHEETS—SHEET 4.

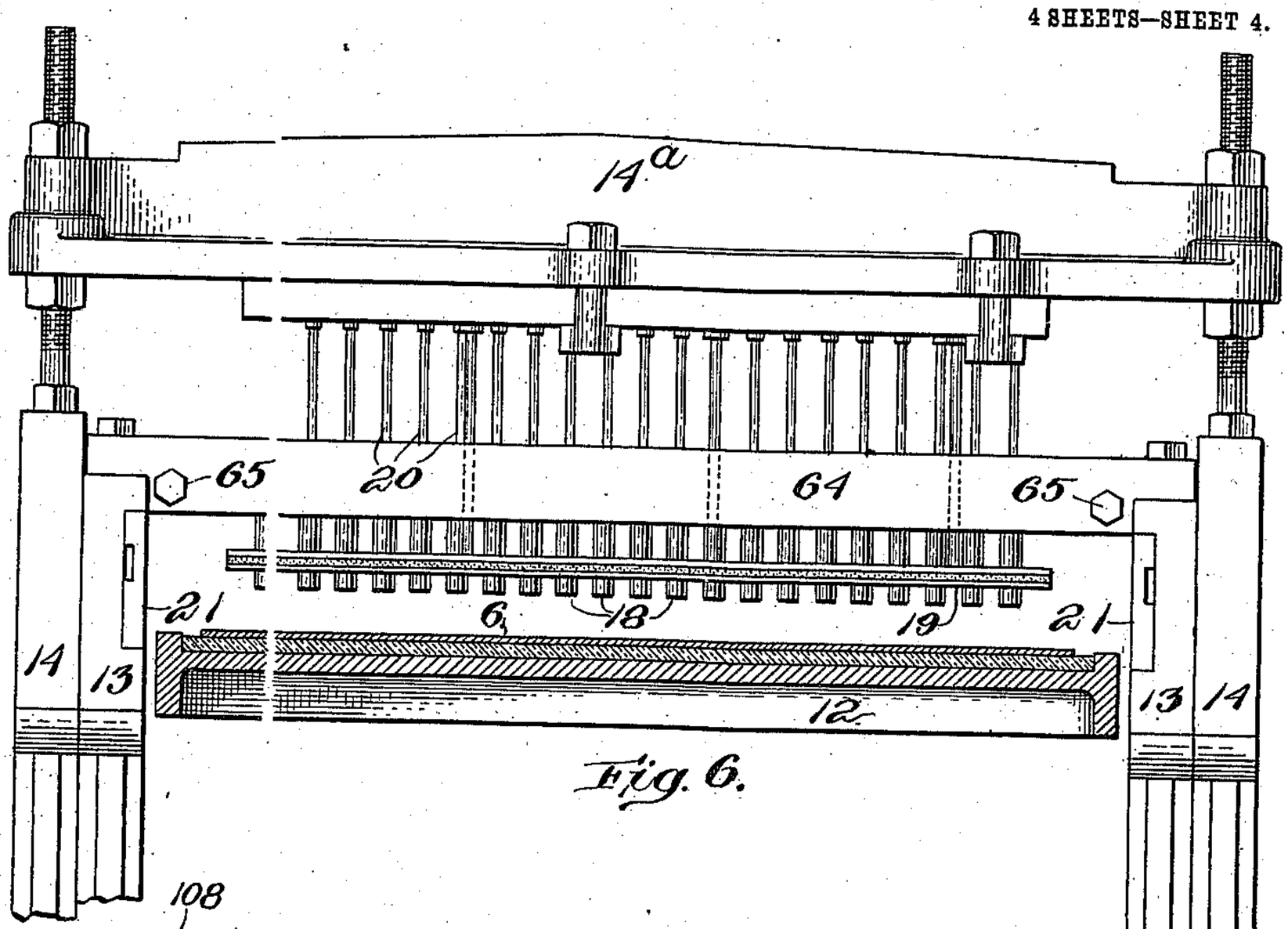

Fig. 6.

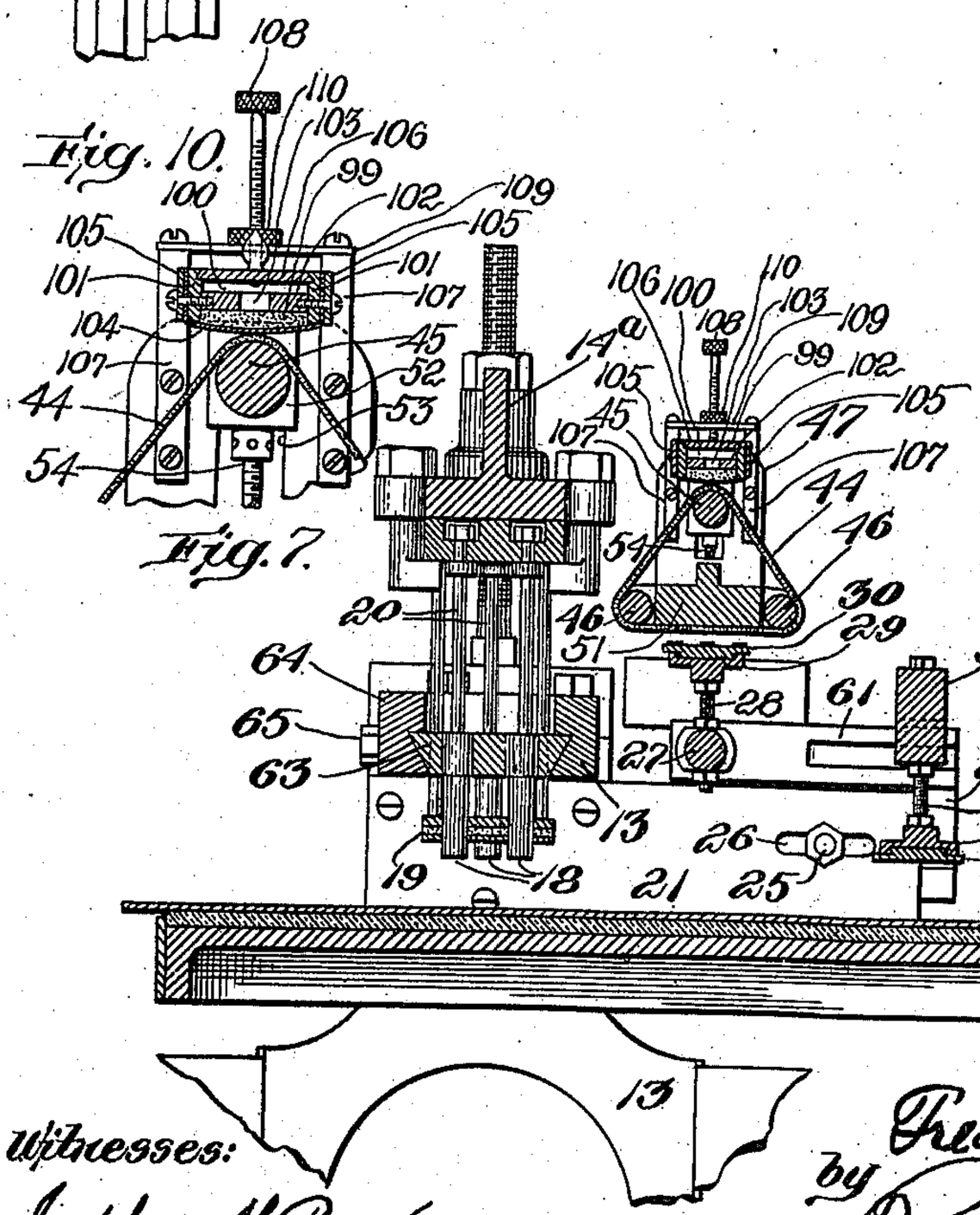

Fig. 7.

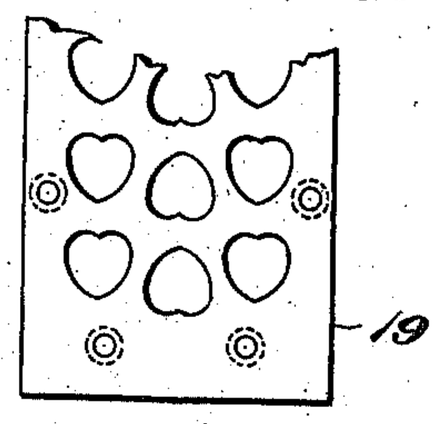

Fig. 8.

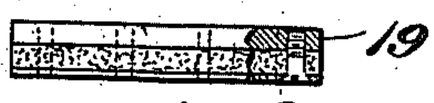

Fig. 9.

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UNITED STATES PATENT OFFICE.

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LOZENGE-MAKING MACHINE.

963,916. Specification of Letters Patent. **Patented July 12, 1910.**

Application filed January 28, 1909. Serial No. 474,742.

To all whom it may concern:

Be it known that I, FREDERICK A. MEIER, a citizen of the United States, and resident of Norfolk Downs, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Lozenge-Making Machines, of which the following is a specification.

This invention relates to a machine for the manufacture of lozenges and consists of the improvements hereinafter described and specifically pointed out in the claims.

In the accompanying drawings,—Figure 1 is a side elevation partly in section of a lozenge machine containing my invention; Fig. 2 is a side elevation on an enlarged scale of the lozenge cutting, printing and embossing mechanisms of the machine shown in Fig. 1; Fig. 3 is an enlarged detail in side elevation of part of said printing and embossing mechanisms; Fig. 4 is a plan view of the mechanism shown in Fig. 2; Fig. 5 is a vertical section on line 5—5 of Fig. 4 viewed in the direction of the arrows; Fig. 6 is a section on line 6—6 of Fig. 4 viewed in the direction of the arrows; Fig. 7 is a vertical section on line 7—7 of Fig. 4; Figs. 8 and 9 are details in plan and edge views respectively of the combined doffer and cutter lubricator hereinafter described; and Fig. 10 is an enlarged sectional detail view showing the construction of the inking pad used in connection with the printing device.

The confectionery paste is placed in a hopper 1 from which it passes into a mixing chamber 1^a, the walls of which are preferably constructed in two parts, the lower part 1^b being fixed to the frame of the machine, and the upper part 1^c being hinged to the frame at 1^d so that it may be swung upward, thus exposing the interior of the chamber 1^a and affording ready access thereto for the purpose of cleaning it. The paste is forced from the mixing chamber 1^a by worm conveyers 3 through a slot 2 in the forward end of the chamber, which forms the paste into a sheet, and from whence it is delivered upon a traveling belt 4. From the belt 4 the paste sheet passes between the reducing rolls 5 and 5^a. The rolls 5^a are supported by blocks 5^b which are adjustable in slots 5^c by means of the screws 5^d. By moving the rolls 5^a toward or away from the rolls 5, the thickness of the paste sheet may be varied. After leaving the reducing rolls the paste sheet passes to a traveling belt 6 which carries it through the lozenge cutting, printing and embossing mechanism 7 (see Fig 1). From mechanism 7 the paste sheet carrying with it the completely cut and formed lozenges, is carried to the end of belt 6, from whence the cut out lozenges fall upon an inclined slide 8 upon which they pass to belt 9 which carries them out of the machine. The perforated paste sheet passes from belt 6 to belt 10, which, in turn, delivers the sheet to a transverse belt (not shown) which discharges the paste into the conveyer 11, by which the sheet, more or less broken up, is returned to the hopper 1 through the chute 11^a.

With the exception of the lozenge cutting, printing and embossing devices, shown in Fig. 1 at 7, the construction and operation of the machine is for the most part the same as that shown in United States Letters Patent to Palmer No. 803,017 dated October 31, 1905, to which reference is made for a more extended description of the general features of the machine.

The present invention relates more particularly to the lozenge forming mechanism 7, which mechanism is shown in greater detail and on an enlarged scale in Figs. 2 to 10 inclusive.

The belt 6 which carries the paste sheet through the lozenge forming mechanism passes over a supporting table 12, at each side of which is a pair of vertically movable slides 13 and 14 connected respectively by the cross members 64 and 14^a. The slides 13 and 14 are operated respectively by eccentrics 15 and 16 mounted on the main shaft 17 to which rotary motion is imparted in any suitable way. The cross member 64 connecting the slides 13 carries a cutter bar 63 in which are set the hollow cutters 18. The cross member 14^a connecting slides 14 carries a doffer 19 and the ejecting pistons 20 which operate within the hollow cutters 18. Fixed to each of the slides 13 is an arm 21 grooved upon its outwardly facing side as

shown at 22 (see Fig. 5) to engage a corresponding tongue 23 pivoted on plate 24 which carries the type bar presently to be described. Plate 24 is secured to its arm 21 with provision for adjustment toward and from the cutters 18 by means of a bolt 25 which passes through slot 26 in arm 21. In order to insure fine adjustment of the plate 24, a thumb screw 24[a] is provided which passes freely through a lug 24[b], the head of this thumb screw bears against one side of the lug and the screw proper is threaded into a lug 24[c] on arm 21. Thus, after the bolt 25 has been loosened, the plate 24 may be finely and accurately adjusted toward or from the cutting mechanism by means of the screw 24[a], and locked in adjustment partly by the check nut 24[f] mounted on the screw 24[a] so as to bear against lug 24[b], and partly by the tightening of the bolt 25.

Journaled between plates 24 is a rock shaft 27 made with arms 28, to the outer ends of which is fixed a bar 29 having on its outer side a longitudinal groove to receive a corresponding longitudinal tongue provided on the type bar 30. The type bar 30 carries the type for printing the desired characters on the lozenges. Shaft 27 carries at one end a gear segment 31 which meshes with a gear segment 32 pivotally mounted on one of the plates 24. (See especially Fig. 3.) The segment 32 is made with a V-shaped notch on the side opposite the gear teeth, the sides 33 and 34 of said notch coöperating with an abutment 35 mounted to slide in horizontal grooves provided therefor in a block 36 fixed to arm 37 which is supported by the frame of the machine. When the segment 32 is moved upward with the movement of plate 24, the abutment 35 causes the segment 32 to swing upwardly on its axis, thus causing the type bar 30 through segment 31 also to swing upwardly, and the downward movement of plate 24 carrying the segment 32 causes the abutment 35 to swing segment 32 downwardly at the same time swinging the type bar 30 downwardly through segment 31. Thus, the type bar 30 swings back and forth between the inking ribbon 44 and the paste sheet on belt 6 through the arc of one half of a circle. The abutment 35 is held in engagement with the V-shaped notch in segment 32 by a coil spring 38 acting through the plunger 39. The plunger 39 bears at one end against the abutment 35 and at its other end is slidably mounted in a stud 40 swiveled on plate 24. The rock shaft 27, the pivot of segment 32, and the stud 40, are arranged in a horizontal line while the abutment 35 is so located that when plate 24 moves upward and downward with slides 13, said abutment will be opposite the axis of segment 32 when half way between its two extreme positions. The spring 38 tends to hold segment 32 at either extreme of its rocking movement.

To limit the rocking movement of the segments, an arm 41 is provided on the segment 31 which coöperates with two stops 42 and 43 fixed respectively to plate 24 above and below the shaft 27 so as to check the swing of the printing device when it reaches its vertical position whether moving upward or downward. The parts are so constructed that during the upward or downward movement of the plate 24, the arm 41 engages the stops 42 and 43 before the type bar 30 makes contact with the inking ribbon 44 or with the paste sheet as the case may be, so that during the last part of the stroke of plate 24 in either direction, the movement of the type bar 30 will be vertical, the swinging movement of the type bar having been completed before the type bar reaches the ribbon or the paste sheet. Thus, the type makes contact with the inking ribbon and with the paste sheet in a path perpendicular thereto instead of contacting with it in a wiping motion which would tend to clog and injure the type and break or injure the paste sheet.

In Fig. 3 the parts are shown in the position occupied just as segment 32 has completed its swinging movement occasioned by the rise of plate 24 and just as type bar 30 has completed its corresponding swinging movement and is about to move in a perpendicular path into contact with the inking ribbon.

The inking ribbon is an endless band supported by the rolls 45, 46 and 46 carried by frame 47. The frame 47 is supported by posts 48 screwed at their lower ends into threaded sockets in the upper ends of arm 37, thumb screws 49 being provided to lock said posts and frame 47 in proper vertical adjustment with relation to the type bar. Each post 48 extends through a slot 50 (see Fig. 4) in the end of frame 47 so that said frame may be adjusted toward and from the cutters 18. The two lower rolls 46 are in the same horizontal plane and are journaled at their ends in fixed bearings on frame 47. Between the rolls 46 is the cross bar 51 supported by frame 47 which serves as a backing to support the ribbon when the type bar 30 is pressed against it. The roll 45 above the rolls 46 is journaled at each end in a box 52 supported in slots 53 by an adjustable capstan screw 54 (see Figs. 7 and 10), so that the ribbon 44 can be kept under proper tension. To insure proper friction between the roll 45 and the ribbon 44, said roll is knurled or roughened as shown in Fig. 5. One of the journals of roll 45 is extended and has secured thereto a ratchet wheel 92. Pivotally mounted on said journal opposite said ratchet wheel 92 is a lever 93 carrying at one end a spring-pressed pawl 94

which engages the teeth of the ratchet wheel 92. The other end of said lever projects between two pins 95 and 96 on an arm or yoke 97 which is mounted on the vertically movable slide 14. The two pins 95 and 96 are fixed to the arm 97 by two thumb screws 98. As the arm 97 moves up and down with slide 14, the pins 95 and 96 will rock the lever 93 causing the pawl 94 alternately to engage the teeth of the ratchet wheel 92 and to pass idly over the teeth, thus moving the inking ribbon 44 step by step. The pins 95 and 96 are adjustable vertically upon the arm 97 by thumb screws 98 (see Fig. 5) thus making it possible to vary the stroke of lever 93 and consequently, to vary the extent of the step by step movement of the ribbon 44.

The ribbon 44 is inked by a pad 99 located just above the roll 45. This pad 99 forms the bottom of a trough or reservoir 100 which comprises two side bars 101 and a cross bar 102 having in it a series of slots 103. The ink is poured into the reservoir or trough and passing through said slots is absorbed by the pad 99. Stretched tightly over the pad 99, which is preferably of felt, is a covering of silk 104 clamped between the side bars 101 and the clamping bar 105, which serves as a support for the felt pad and provides a smooth and durable surface for contact with the inking ribbon. The top of the reservoir or trough is protected by a removable, dust-proof, sliding cover 106. The reservoir itself is supported in two ways between two sets of upright guides 107 fixed to the frame 47. Thumb screws 108 which are threaded through plates 109 fixed to the guides 107 and carry the check nuts 110, provide means for vertically adjusting the trough and regulating the pressure between the pad and the inking ribbon. By loosening the screws 108, the entire reservoir may be removed for the purpose of cleaning. The silk covering 104 of the pad acts also as a scraper to remove the starch dust which settles on the inking ribbon so that the type will not become clogged therewith.

The embossing plate 56 is carried by a frame 57 having downwardly extending arms 58 carrying at their lower ends a bar 59 provided with a longitudinal groove on its under face to receive a corresponding tongue on the upper side of the embossing bar 56. The frame 57 is made at its ends with jaws 60 (Fig. 5) projecting under flanges 61 provided upon the inner sides of the plates 24. Above each jaw 60 is a screw 62 between which and its coöperating jaw 60, the flange of plate 24 is gripped to fix the frame 57 in position upon said plate. The frame 57 is provided with a thumb screw 57^a which passes freely through the frame 57 and bears a check nut 57^b. The head of the thumb screw bears against one side of the frame 57 and the check nut 57^b bears against the other side, while the opposite end of the screw is threaded into the lug 24^c which is fixed to arm 21. This connection between the embossing frame and the plates 24 admits of accurate adjustment of the embossing plate 56 toward and from the printing and cutting devices. The importance of close adjustment both of the printing and of the embossing devices with relation to the cutting devices and to each other, will be appreciated when it is recalled that the machine is designed to employ different styles and different sizes of cutters.

In order to provide for the removal of the cutters 18 and the substitution of others of other styles, the said cutters are mounted on a cutter bar 63 removably held by the top cross bar of the slides 13 by plate 64 and bolts 65.

One of the drums 64^a which carries the belt 6 has fixed to its journal a pinion 65 (Fig. 2) driven by a gear 66 journaled on a stud 67 fixed to the frame of the machine. Beside gear 66 is fixed a ratchet 68 engaged by a pawl 69 carried by a lever 70 which is fulcrumed on stud 67. This lever is connected by an eccentric rod 71 with an eccentric 72 on main shaft 17. Through this mechanism belt 6 is moved step by step a predetermined distance at each operation of the machine, so that the paste sheet is carried forward at each step sufficiently far to shift the embossed section of the paste sheet under the printing device, the printed and embossed section under the cutting device, and to carry the completed lozenges away from the lozenge forming mechanisms.

To regulate the extent of the movement of belt 6, and consequently of the paste sheet, to correspond with the style and size of the lozenge forming tools being used in the machine, the rod 71 is connected with lever 70 by a stud 73 adjustably fixed in a slot 74 provided in lever 70. The belt 10 which takes the perforated paste sheet from belt 6 is driven at the same speed as belt 6. To provide means for regulating the speed of belt 10 to correspond with that of belt 6, a pinion 76 is fixed to the journal of drum 75 and is driven by a gear 77, mounted on a stud 78 projecting from the frame of the machine. Beside gear 77 there is secured a ratchet wheel 79 engaged by a pawl 80 which is pivoted to lever 81. The lever 81 is fulcrumed on stud 78 and is provided with a slot 82 in which is adjustably fixed a stud 83 connected by link 84 to its stud 73. Thus, the belts 6 and 10 actuated respectively by the ratchets 68 and 79 are operated simultaneously by eccentric 72.

When the paste sheet leaves the chamber 1^a, powdered starch is applied to both sides

of the paste sheet to prevent it from adhering to the belts and rollers by which it is passed through the machine. For this purpose two starch-holding frames or boxes 85 and 86 are provided. The box 85 rests upon the belt 4 and as the latter travels thereunder, starch is carried by the belt to the under side of the paste sheet. The forward end 87 of the box 85 acts as a scraper to regulate the quantity of the starch which passes thereunder with the belt. The frame 85 is provided close to its forward end with a weight 89 which holds the scraper 87 closely against the belt 4 at the same time allowing starch still adhering to the lower stretch of belt 4 to pass under the rear end 88 of the box 85 and again be collected within the box by the scraper 87. The upper side of the paste sheet is starched by belt 90 which transfers starch from frame 86 to the top of the paste sheet. Frame 86 is weighted at its forward end as shown at 91 like frame 85 and for the same purpose.

What I claim and desire to secure by Letters Patent is:

1. In a lozenge-making machine, a printing device comprising an ink carrier, a work support, a type carrier therebetween secured to a rock shaft, said rock shaft journaled upon a pair of reciprocating plates, and means to oscillate said shaft and type carrier alternately between said ink carrier and said work support, comprising a gear segment mounted on said rock shaft, a gear segment in mesh therewith pivoted to one of said reciprocating plates, and an abutment carried by a fixed part of the machine adapted to actuate the latter gear segment when the reciprocating plate carrying the same is moved.

2. In a lozenge-making machine, a printing device comprising an ink carrier, a work support, a type carrier therebetween secured to a rock shaft, said rock shaft journaled upon a pair of reciprocating plates, and means to oscillate said shaft and type carrier alternately between said ink carrier and said work support, comprising a gear segment mounted on said rock shaft, a gear segment in mesh therewith pivoted to one of said reciprocating plates, an abutment carried by a fixed part of the machine adapted to actuate the latter gear segment when the reciprocating plate carrying the same is moved, and stops to limit the movement of oscillation of said ink carrier before the type engages the ink carrier or the work.

3. In a lozenge-making machine, a printing device comprising an ink carrier, a work support, a type carrier therebetween secured to a rock shaft, said rock shaft journaled upon a pair of reciprocating plates, and means to oscillate said shaft and type carrier alternately between said ink carrier and said work support, comprising a gear segment mounted on said rock shaft, a second gear segment in mesh with the first pivoted to one of said reciprocating plates, said second gear segment having a V-shaped notch therein on the side opposite the gear teeth, and a movable spring-pressed abutment supported by a fixed part of the machine and engaging said V-shaped notch.

4. In a lozenge-making machine, a printing device comprising an ink carrier, a work support, a type carrier therebetween secured to a rock shaft, said rock shaft journaled upon a pair of reciprocating plates, and means to oscillate said shaft and type carrier alternately between said ink carrier and said work support, comprising a gear segment mounted on said rock shaft, a second gear segment in mesh with the first pivoted to one of said reciprocating plates, said second gear segment having a V-shaped notch therein on the side opposite the gear teeth, a movable spring-pressed abutment supported by a fixed part of the machine and engaging said V-shaped notch, and a pair of stops upon said reciprocating plate adapted to limit the movement of oscillation of said type carrier before the type engages the ink carrier or the work.

5. In a lozenge-making machine, an inking device, comprising an inking ribbon carried by rollers, means to rotate said rollers to feed said ribbon, and an ink trough mounted above said ribbon and one of said rollers, the bottom of said ink trough consisting of a pad of absorbent material having an outer covering of silk tightly stretched across said absorbent material, said silk covering making rubbing contact with said inking ribbon as the latter passes over said roller.

6. In a lozenge-making machine, an inking device, comprising an inking ribbon carried by rollers, means to rotate said rollers to feed said ribbon, and an ink trough mounted above said ribbon and one of said rollers, said trough comprising side walls, a transverse wall provided with perforations, and a bottom consisting of a pad of absorbent material located below said transverse wall, said pad making contact with said inking ribbon as the latter passes over said roller.

7. In a confectionery machine, a printing device comprising an oscillating type carrier, an inking ribbon, said inking ribbon carried by three rollers of which two stretch the ribbon in position to make contact with type carried by said oscillating type carrier, and the third is pivoted above the other two, means automatically to rotate one of said rollers intermittently to feed said ribbon step by step between the periods of contact with the type, an ink trough mounted above

said third roller, the bottom of which consists of an absorbent inking pad in engagement with the inking ribbon passing over said upper roller, and means to adjust the ink trough with relation to the upper roller to regulate the pressure between the inking pad and ribbon.

Signed by me at Boston, Massachusetts, this 18th day of January, 1909.

FREDERICK A. MEIER.

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