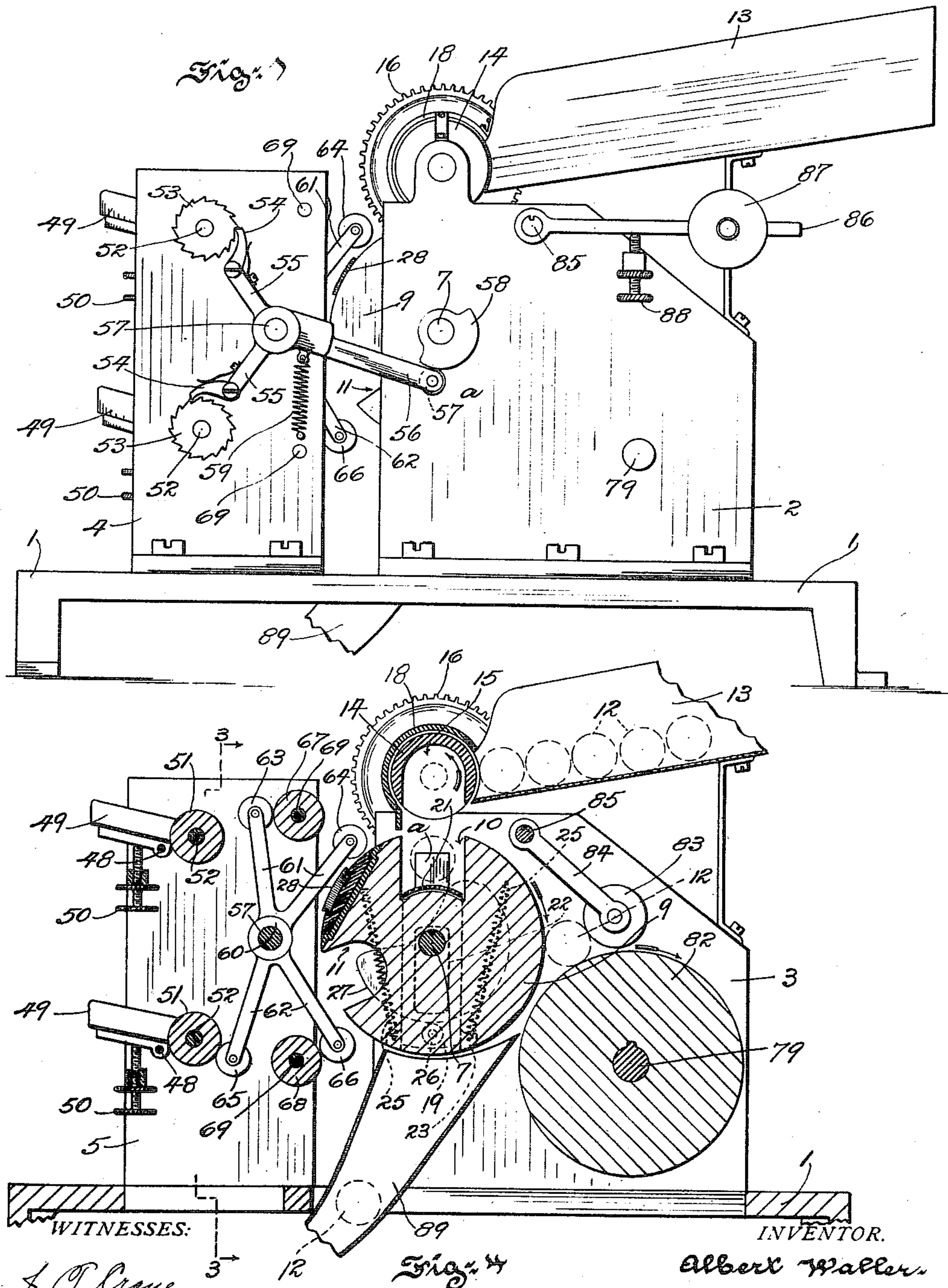


985,479.

A. WALLER.
PRINTING APPARATUS.
APPLICATION FILED APR. 14, 1910.

Patented Feb. 28, 1911.

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

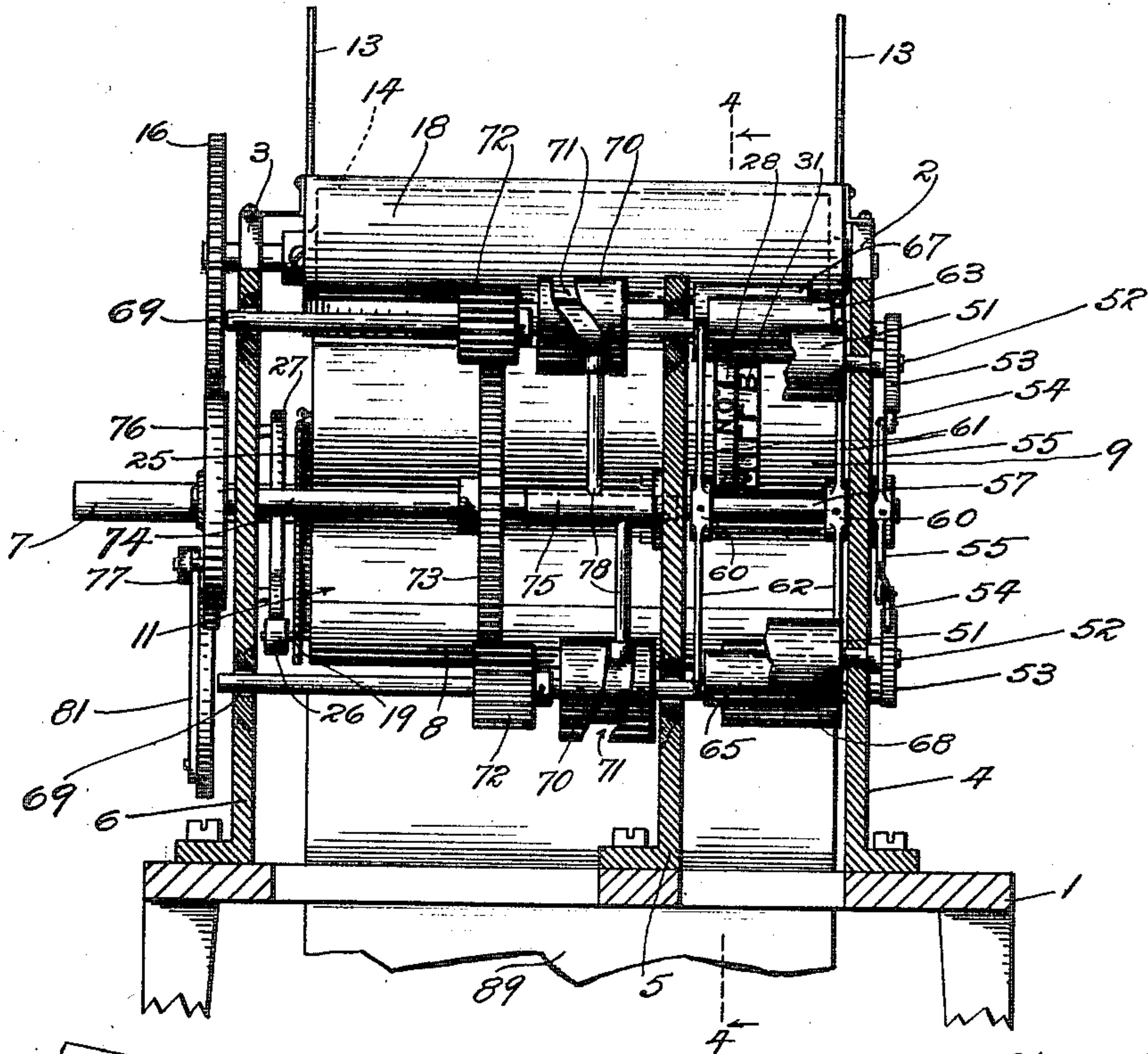
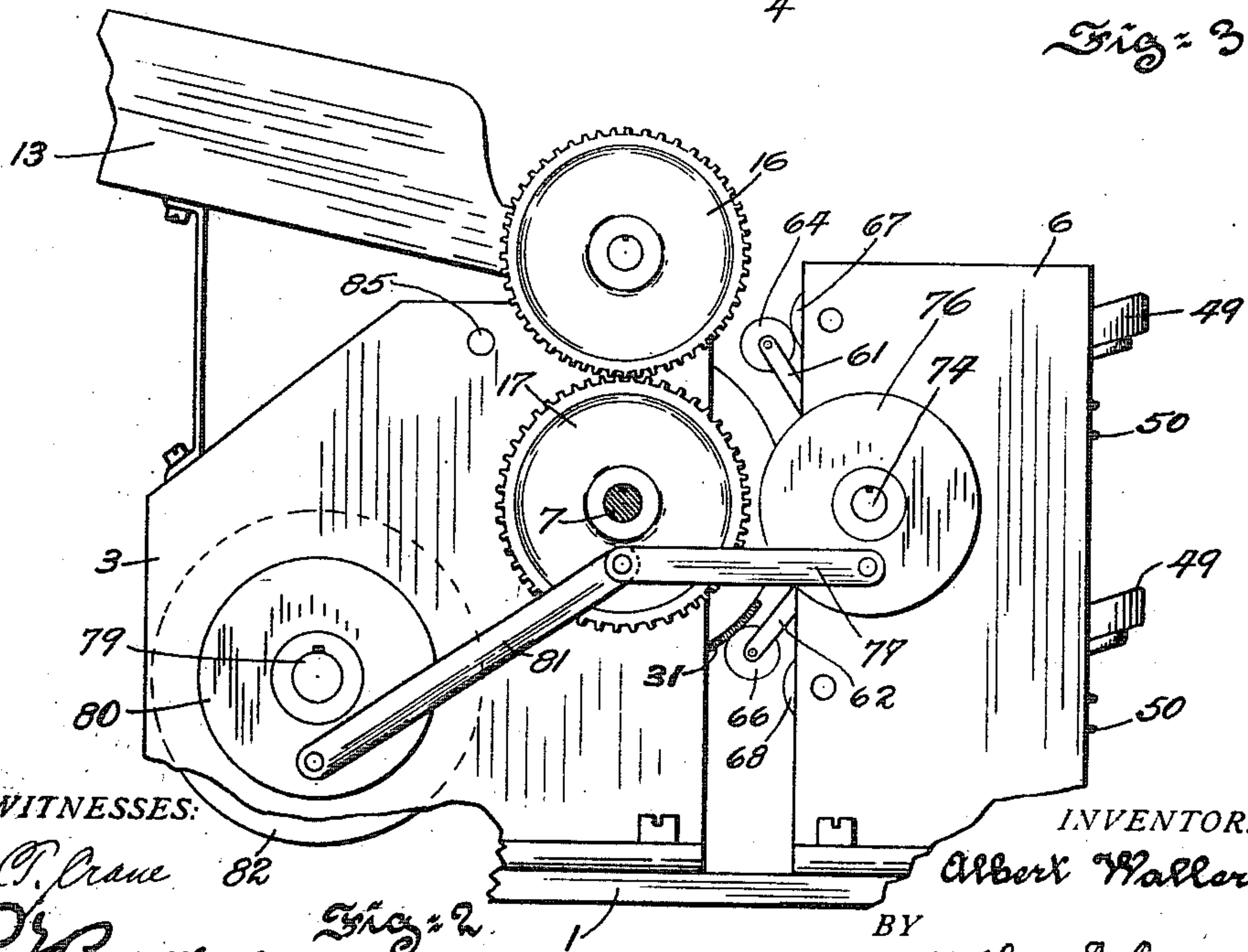


Fig. 3



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Fig. 2

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4 SHEETS—SHEET 3.



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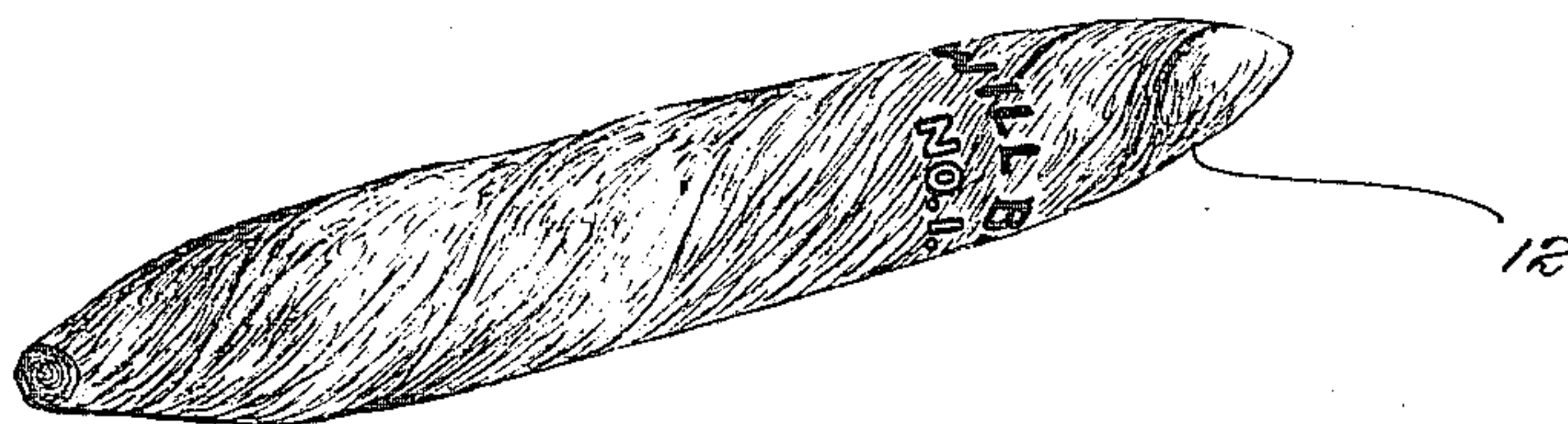
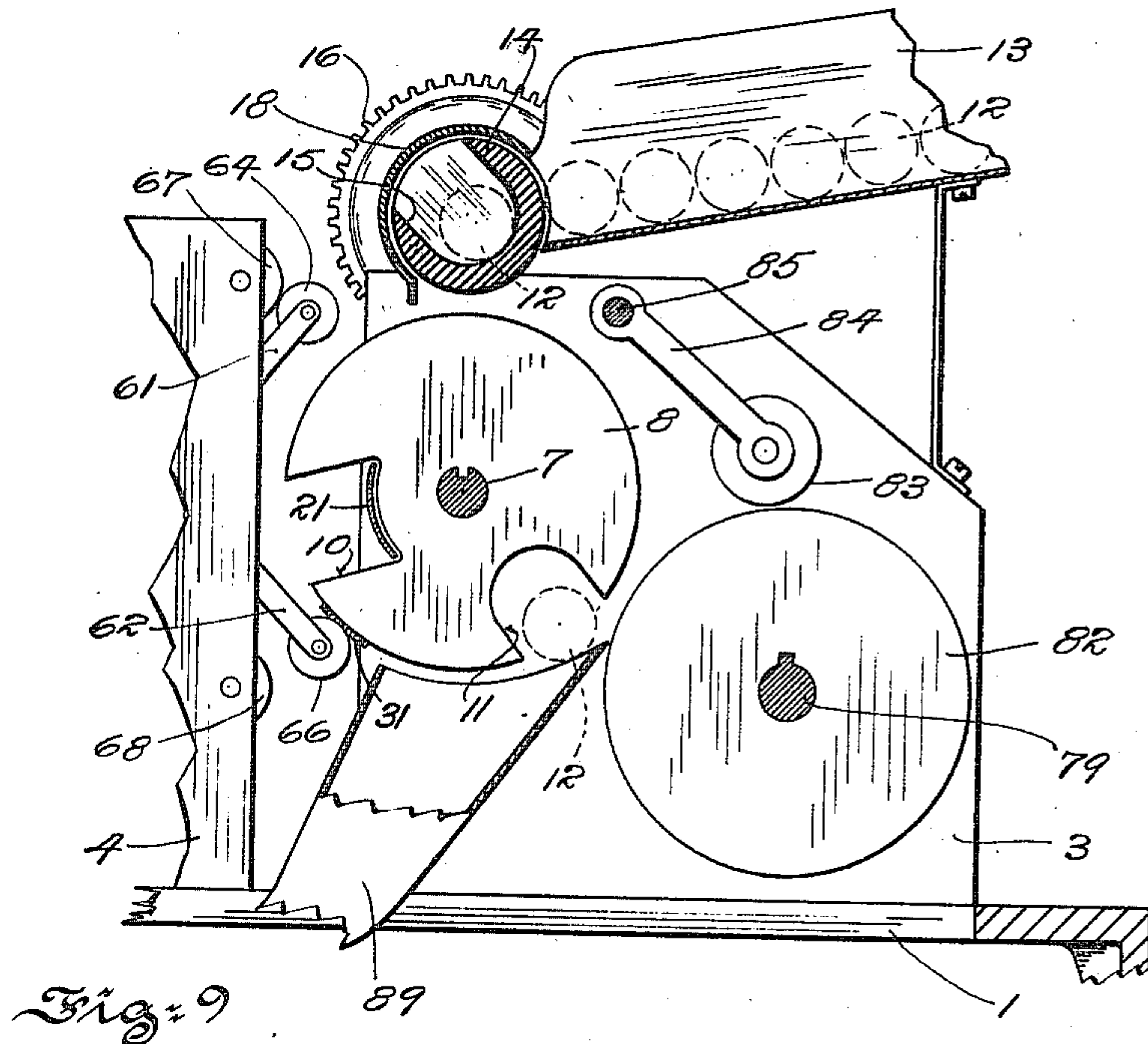
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985,479.

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4 SHEETS—SHEET 4.



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PRINTING APPARATUS.

985,479.

Specification of Letters Patent. Patented Feb. 28, 1911.

Application filed April 14, 1910. Serial No. 555,526.

To all whom it may concern:

Be it known that I, ALBERT WALLER, a subject of the Emperor of Germany, residing at the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Printing Apparatus, of which the following is a specification.

This invention relates to printing apparatus and has more particular relation to that class of machinery designed for the printing of two or more colors simultaneously.

The principal object of the present invention may be said to be the providing of printing apparatus of a rotary type adapted to print upon cylindrical objects two or more colors at one impression.

A further object of the present invention is to provide multi-color printing apparatus in which the printing cylinder is equipped with printing characters, adapted to alternately receive in their rotation coloring matter and impress the same upon a cylindrical object simultaneously.

A still further object of the present invention is to provide a printing cylinder adapted to receive an object to be printed, automatically eject the same for printing purposes and finally permit of the escape of the printed object.

A still further object of the present invention is to provide feed mechanism adapted to feed one at a time from a hopper cylindrical objects to a printing cylinder.

A still further object of the present invention is to provide inking mechanism for supplying multi-colors to a print cylinder in which the inking rolls alternately supply to the printing cylinder a different color.

A still further object of the present invention is to provide a multi-color printing apparatus adapted to print upon a cigar an imitation band or other character or characters of two or more colors at one impression.

Other objects of the invention relate to the providing of an efficient, durable, simple and comparatively inexpensive multi-color printing apparatus designed to reduce the cost of marking trade-names and the like upon cigars by stamping directly upon the cigar an imitation band or the like in lieu of printing a band and securing the same around a cigar.

Other objects of the invention relate to the providing of general details of construction and arrangement of parts as will hereinafter appear.

The invention consists of the improvements hereinafter described and finally claimed.

The nature, characteristic features and scope of the invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof and in which:

Figure 1, is a view in elevation of one side of the printing apparatus embodying the invention. Fig. 2, is a similar view looking from the opposite side of the apparatus, Fig. 3, is a view in section taken upon the line 3—3 of Fig. 4, looking in the direction of the arrows, Fig. 4, is a view in section taken upon the line 4—4 of Fig. 3, Fig. 5, is a view drawn to an enlarged scale, principally in section, of the printing cylinder, Fig. 6, is a transverse sectional view of the printing cylinder illustrating the ejector in extended position, Fig. 7, is a fragmentary view in transverse section of the printing cylinder illustrating the fixed printing plate, Fig. 8, is a transverse sectional view of the printing cylinder illustrating the movable printing plate, Fig. 9, is a view in elevation, partly sectioned, illustrating the feed and ejecting elements in operation, and Fig. 10, is a perspective view of a cigar having delineated thereon a form of imitation band as printed by apparatus of the invention.

Referring to the drawings apparatus has been disclosed of a type best known to me at this time, illustrative of the principle of the invention, said apparatus being constructed for printing upon a cigar an imitation band bearing a trade-mark or other name designating the brand of cigar. While the following description will be limited to such application of the invention, obviously I have in mind the printing upon other cylindrical objects, characters of two or more colors at a single impression.

The printing apparatus is designed to be supported upon a bed-plate 1, rising from which are standards 2, 3, 4, 5, and 6. Rotatably supported between the standards 2, and 3, and keyed to the main driving shaft 7, is a two-part printing cylinder, comprising sections 8, and 9, see Fig. 5, adapted for rotation in the direction of the arrow in Fig.

4, motion being imparted to the main driving shaft in any preferred manner. The printing cylinder is provided with transversely extending substantially U-shaped grooves 10, and 11, the groove 10, serving as a receiving groove and the groove 11, serving as a discharge groove. Cigars 12, contained within the hopper 13, are fed one at a time to the receiving groove 10, by means of a rotating cylinder 14, provided with a U-shaped groove 15, said cylinder being journaled between standards 2, and 3, and rotating in the direction of the arrow, in Fig. 4, motion being imparted to said cylinder by means of a gear wheel 16, which meshes with a gear wheel 17, keyed to the main driving shaft 7. As shown in Fig. 4, the cylinder 14, is immediately above the printing cylinder and the grooves 10, and 15, of the cylinders are so arranged that the respective grooves register once in every complete revolution of the two cylinders, the cigars within the hopper being prevented from escaping by virtue of the outer surface of the cylinder 14, during its rotation and the cigar within the groove 15, being prevented from escaping by virtue of a fixed hood 18, which partially encircles the cylinder 14.

The printing cylinder is equipped with ejecting mechanism for impinging against a cigar within the receiving groove 10, to eject same for printing purposes. As shown the ejecting mechanism comprises a slide 19, fitted between guides 20, which are fixed to the end of the cylinder adjacent to the standard 3, said slide terminating in an ejecting plate 21, which extends at right angles to the slide 19, and extends throughout the length of and within the groove 10, of the printing cylinder, see Fig. 5, and normally rests upon the bottom of the said groove. As shown in Fig. 5 the plate 21, is provided with adjustable guides *a* and *b*, for the purpose of accommodating cigars of various sizes whereby they may be positioned properly for being printed upon. The slide 19, is slotted as at 22, for the accommodation of the main driving shaft 7, and the base of the slide is provided with lugs 23, connecting which and pins 24, fixed to the printing cylinder end are tension springs 25. Arranged centrally of the slide 19, and adjacent the lugs 23, thereof is a roller 26, adapted for travel around a fixed cam 27, said cam being supported by the standard 3. During the rotation of the printing cylinder the ejecting medium is operated once from the position shown in Figs. 4, 5, and 9, to the position shown in Figs. 6, 7, and 8.

The section 9, of the printing cylinder is provided with a fixed and a movable printing plate bearing suitable characters for printing upon the cigars 12. As clearly illustrated in Fig. 7, the printing plate 28, comprises a recessed member 29, fitted with-

in a counter-sunk portion upon the circumference of the printing cylinder and is secured thereto so as to be flush with the outer surface thereof by means of screws 30. Suitably fitted within the recessed portion of the member 29, is a steel or copper plate or other suitable printing device bearing the characters for printing upon the cigars. As clearly shown the printing plate 28, is arranged between the grooves 10, and 11, of the printing cylinder. The movable printing plate 31, is immediately adjacent the fixed plate 28 and comprises a member 32, also recessed and secured within a counter-sunk portion of the printing cylinder so as to be flush with the outer circumference thereof, by means of screws 33. This plate 32, is recessed slightly deeper than the member 29, and is centrally apertured as at 34, said aperture registering with a radially extending passage 35, within the section 9, of the printing cylinder, the said passage 35, being provided with a shoulder 36. Having fixed relation with the plate 37, which constitutes the character impressing medium is a stem 38, affording slidable movement through the passage 35, and aperture 34. This stem 38, is provided with a roller 47, below which and connecting the stem and the printing cylinder is a pull spring 40, constituting a cushion for the print plate and which serves to normally draw or pull the printing plate toward the cylinder center. As clearly illustrated in Figs. 5, and 8, the section 9, of the printing cylinder is concentrically bored as at 41, for the accommodation of a cam 42, which has fixed relation as by means of a sleeve 43, with the standard 2, see Fig. 5. This cam 42, is provided with a high part 44, an intermediate part 45, and a low part 46. During the rotation of the printing cylinder the printing plate just described alternately assumes one of the three positions as the roller 47, of the stem 38, travels around the cam surface of the cam 42. The respective movements of the movable printing plate may be said to be high when receiving ink, low when the fixed print plate is being inked and intermediate when the two plates are printed simultaneously.

Constructed for supplying the above-mentioned printing plates with inking material of two or more colors is the inking mechanism of the invention shown as being supported by the standards 4, 5, and 6. Pivotaly supported as at 48, between the standards 4, and 5, are ink boxes 49, adjusting screws 50, being present for regulating the position of the ink boxes. The ink boxes 49, are preferably inclined to the position shown in Fig. 4, for feeding at all times ink to the ink rolls 51, which are journaled between the standards 4, and 5, upon intermittently rotating shafts 52. Intermittent motion is imparted to the shafts 52, by

means of ratchet wheels 53, pawled by dogs 54, pivotally carried by the forked portions 55, of the arm 56, the said arm being in turn supported upon a rod 57, pivotally supported between the standards 4, and 5. As shown in Fig. 1, the free end of the arm 56, is provided with a roller 57, for co-operating with the cam 58, which is fixed to the main driving shaft 7. The cam 58, is provided with a high and low part and in its rotation the high part serves to depress the free end of the arm 56, thereby moving the rolls 51, for the distance of one ratchet space, the spring 59, serving to return the arm 56, to place when the low part of the cam 58, commences to travel upon the roller 57^a, of said arm. Having fixed relation with the shaft 57, arc collars 60, each collar being provided with two pair of generally forked arms 61, and 62, see Figs. 3, and 4, the arms of each group constituting a substantially K-shaped structure. The free ends of these arms 61, and 62, have journaled therebetween ink transferring rolls 63, 64, 65, and 66. The ink transferring rolls 63, and 65, are adapted to intermittently receive ink from and transfer the same to still other ink rolls 67, and 68, respectively from which rolls the transferring rolls 64, and 66, in turn intermittently receive ink and deliver the same to the printing plates carried by the printing cylinder. As shown in the drawings and for the sake of illustration only the transferring rolls 64, ink the fixed printing plate and the rolls 66, ink the movable print plate. As illustrated in Fig. 3, the ink rolls 67, and 68, are mounted upon rotatable and endwise shiftable shafts 69, fixed to which are cams 70, provided with cam grooves 71. The shafts 69, are also provided with gear wheels 72, between which and meshing therewith is an intermediate gear 73. The intermediate gear 73, is mounted upon a shaft 74, which is rotatably supported between the standard 6, and the fixed stud 75, carried by the standard 5, and motion is imparted thereto by means of a wheel 76, having linked connection as at 77, with the gear wheel 17, upon the main driving shaft 7, see Fig. 2. Carried by the fixed stud 75, above referred to and extending upwardly and downwardly therefrom are fixed pins 78, provided with rollers adapted to track within the grooves 71, of the cams 70. As clearly illustrated in Fig. 3, the pins 78, are so arranged with respect to the cam grooves 71, that the shafts 69, including their complemental gears 72, are alternately shifted in different directions. By means of these alternately shifting shafts 69, the ink rolls 67, and 68, receive and transfer a uniform supply of inking material which is advantageous.

The end of the machine opposite to the

end carrying the inking apparatus is provided with a rotatable shaft 79, motion to which is imparted by means of a wheel 80, having linked connection as at 81, with the gear wheel 17, of the main driving shaft 7. Mounted upon and rotatable with the shaft 79, is a roll 82, adapted to travel in a direction opposite to that of the print cylinder. As clearly illustrated in Figs. 4, and 9, this roll 82, is immediately adjacent and extends parallel with the print cylinder but in a plane below that of the cylinder. Immediately above the roll 82, is a comparatively small roll 83, supported between arms 84, carried by the rod 85, pivotally supported between standards 2, and 3. As shown in Fig. 1, the rod 85, is connected with a stem 86, provided with a weight 87. The standard 2, supports an adjusting screw 88, whereby the stem 86, may be positioned for regulating position of the roll 83. In this connection, it may be remarked that the arms 84, rod 85, and stem 86, are arranged and constructed so as to constitute in effect a one-piece element to provide a cigar retaining tension device. In other words when a cigar as indicated by dotted lines in Fig. 4, has been ejected from the printing cylinder for printing purposes, it is deposited between the printing cylinder, roll 83, and roll 82, the rotating printing cylinder and roll 82, revolving the cigar with respect thereto, the roll 83, acting as a tension device serving to prevent the escape of the cigar and also acting as a cushion-like device to prevent the cigar from being crushed between the printing cylinder and roll 82. A discharge hopper 89, is arranged beneath the printing cylinder for the reception of cigars after being printed.

The operation of the above recited apparatus may be described as follows: Motion being imparted to the main driving shaft 7, the movable printing plate 37, of the printing cylinder is first inked by means of the transferring ink roller 66, it being understood in this connection, that the said printing plate has been shifted by means of the high part 44, of the cam 42, until the printing plate extends beyond the fixed printing plate 28, so that the movable printing plate alone is inked. As the printing cylinder continues in its rotation the high part of the cam 58, on the main driving shaft 7, engages the end of the arm 56, thereby depressing the same and shifting the ink roll 64, forward and shifting rearward the ink roll 66. During the shifting of the ink rolls the roller 47, of the stem 37, of the movable printing plate passes the low part 46, of the cam 42, thereby bringing the printing plate to its lowest position and permitting the ink roller 64, to ink the fixed printing plate. In the meantime the receiving groove 10, of the printing cylinder and the groove 15, of

the rotating cylinder 14, have registered and a cigar permitted to gravitate to the receiving groove 10, in the printing cylinder. As the printing cylinder further rotates, the movable printing plate, by virtue of the stem and its roller cooperating with the intermediate portion 42, of the cam, is lifted to a position flush with the fixed printing plate the respective plates being supplied with different colored inks. During the outward movement of the printing plate 37, the roller 26, of the ejector 19, is passed over the generally inclined surface 90 of the cam 27, thus causing the plunger 19, to operate to eject a cigar from the printing cylinder at the point designated 91, in Figs. 4, 6, and 7, and 8, which illustrate the position of the plunger and fixed and movable printing plates at this time. As the printing cylinder continues in its rotation the roll 82, together with the printing cylinder serves to rotate the cigar, the roll 83, serving to keep the cigar in place. The cigar in this position next receives the impressions of the fixed and movable printing plates. The impressions may be either an imitation band or other printing. As the printing plates recede from the cigar being printed upon the groove 11, of the printing cylinder immediately comes into position to receive the printed cigar and deliver the same to the chute 89, see Fig. 9, it being understood that in the meantime the rotating cylinder 14, received from the hopper 13, another cigar and is rotating and is so timed with the printing cylinder as to have its groove register with the groove 10 in the said cylinder immediately after a printed cigar has been delivered to the chute 89, see Fig. 9. The operation as above described is repeated and again repeated step for step during the entire operation of the machine.

What I do claim is:

1. Apparatus of the class described comprising a continuously operating printing cylinder provided with receiving and discharging grooves, a continuously operating feed cylinder for delivering one at a time cylindrical objects to the receiving groove of the printing cylinder, fixed and movable printing plates carried by the printing cylinder, intermittently operated inking devices for supplying inks of different colors to the printing plates, means for ejecting the objects to be printed from the said receiving groove to a position in the path of the printing plates and means for retaining the printed object at the point of discharge until the discharge groove of said cylinder permits its escape.

2. Apparatus of the class described comprising a continuously operated printing cylinder said cylinder being provided with receiving and discharging grooves, a continuously operating feed cylinder for de-

livering one at a time a cylindrical object to said receiving groove, a printing plate fixed to the cylinder, a printing plate movable relatively to the fixed plate, means for moving the movable plate above and below the plane of the fixed plate, intermittently operated devices for supplying first one and then the other of said plates with inking materials of different colors, ejecting means for discharging said cylindrical object from the receiving groove to a position in the path of the printing plates and means for retaining the printed object at the point of discharge until the discharge groove comes in alinement therewith to permit its escape.

3. Apparatus of the class described comprising a main driving shaft, a printing cylinder rotatable therewith, said cylinder being equipped with longitudinally arranged receiving and discharging grooves, means for feeding one at a time cylindrical objects to the receiving groove, an ejector for discharging the received object, printing plates carried by the cylinder between the said grooves, intermittently operated inking rolls for inking first one and then the other of said plates with different colors, means for retaining the discharged object at the point of discharge and in the path of the printing plates until the discharge groove comes into alinement with said object to permit its escape.

4. Apparatus of the class described comprising a main driving shaft, a printing cylinder rotatable therewith provided with receiving and discharging grooves, feeding mechanism above the cylinder for feeding one at a time cylindrical objects to the receiving groove, a discharge chute beneath the cylinder, an ejector rotatable with the cylinder for ejecting the object from within the receiving groove, a fixed cam with which the ejector cooperates for discharging purposes, printing plates carried by the cylinder, means for intermittently supplying said plates with different colored inks and a pair of rollers for retaining the ejected object in position to be printed and until the discharge groove comes into alinement therewith to permit its escape to said chute.

5. Apparatus of the class described comprising a main driving shaft, a printing cylinder rotatable therewith said cylinder being provided with longitudinally extending generally U-shaped receiving and discharge grooves, a rotatable feed cylinder also having a longitudinally extending generally U-shaped groove for feeding one at a time cylindrical objects to the receiving groove, an ejector afforded slidable movement with respect to the cylinder for discharging the received object, printing plates carried by the cylinder for simultaneously impressing upon the ejected object delineations of two or more colors, intermittently

operated devices for inking said plates, a rotatable cylinder and a tension device for retaining the ejected object in the path of the printing plates until the discharging groove comes into alinement therewith and a discharge chute to receive the released object.

6. In apparatus of the class described, the combination of a continuously operating driving shaft, a printing cylinder provided with receiving and discharging grooves, a continuously operating feed cylinder for delivering one at a time cylindrical objects to the receiving groove of the printing cylinder, fixed and movable printing plates carried by said cylinder, rotatable and endwise shiftable shafts operatively connected with the main driving shaft, ink rolls carried by the shiftable shafts, other ink rolls for transferring to and receiving from said rolls inks of different colors for delivery to the printing plates of the printing cylinder and means operatively connected with the main driving shaft for intermittently operating the last mentioned rolls.

7. Apparatus of the class described comprising a main driving shaft, a printing cylinder rotatable therewith said cylinder being provided with a receiving groove, a fixed cam, an ejector comprising a plate having slidable relation with the cylinder and having slotted engagement with the main driving shaft said plate having arranged at right angles thereto a pusher extended throughout the length of the receiving groove, a roller carried by the plate and adapted for travel over the cam surface, and tension springs between the plate and cylinder.

8. Apparatus of the class described comprising a main driving shaft, a printing cylinder rotatable therewith one end of said cylinder being provided with an opening arranged concentric with the cylinder, a fixed cam within said opening, a fixed printing plate carried by the cylinder, a movable printing plate also carried by the cylinder provided with a depending stem, a roller carried by said stem for travel over the cam surface and a spring normally pulling the printing plate toward the cylinder center, whereby during the rotation of the cylinder

the movable printing plate assumes positions in the same plane and above and below the plane of the fixed printing plate.

9. Apparatus of the class described feed mechanism comprising a rotatable cylinder said cylinder being provided with a U-shaped groove extending throughout the length of the cylinder, a hood partially encircling the said cylinder, a feed hopper with which said groove registers in its rotation, a printing cylinder provided with a U-shaped receiving groove, means for rotating the said cylinder, whereby once in each revolution of the cylinders the respective grooves register for the delivery of a cylindrical object from the first mentioned cylinder to the printing cylinder.

10. Apparatus of the class described comprising a continuously operating printing cylinder provided with receiving and discharging grooves, a continuously operating cylinder for feeding cylindrical objects to the groove of the printing cylinder, fixed and movable printing plates carried by the printing cylinder, intermittently operated inking devices for supplying inks of different colors to the printing plates, means for ejecting said objects from the receiving groove of the printing cylinder into the path of said printing plates and means for permitting the cylindrical object to escape when printed.

11. Apparatus of the class described comprising a printing cylinder provided with a receiving groove, means for feeding one at a time cylindrical objects to the receiving groove, means for ejecting said object from said groove, a rotating cylinder arranged parallel with but in a plane below that of the printing cylinder for receiving the ejected object and a tension roll pivotally supported above the receiving roll for retaining the ejected object in position upon said cylinder and in the path of the printing plates for printing purposes.

In testimony whereof, I have hereunto signed my name.

ALBERT WALLER.

Witnesses:

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J. T. CRANE.