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Patented June 19, 1900.

H. H. JACOBUS.
INKING APPARATUS.

(Application filed Sept. 8, 1899.)

3 Sheets—Sheet 1.

(No Model.)

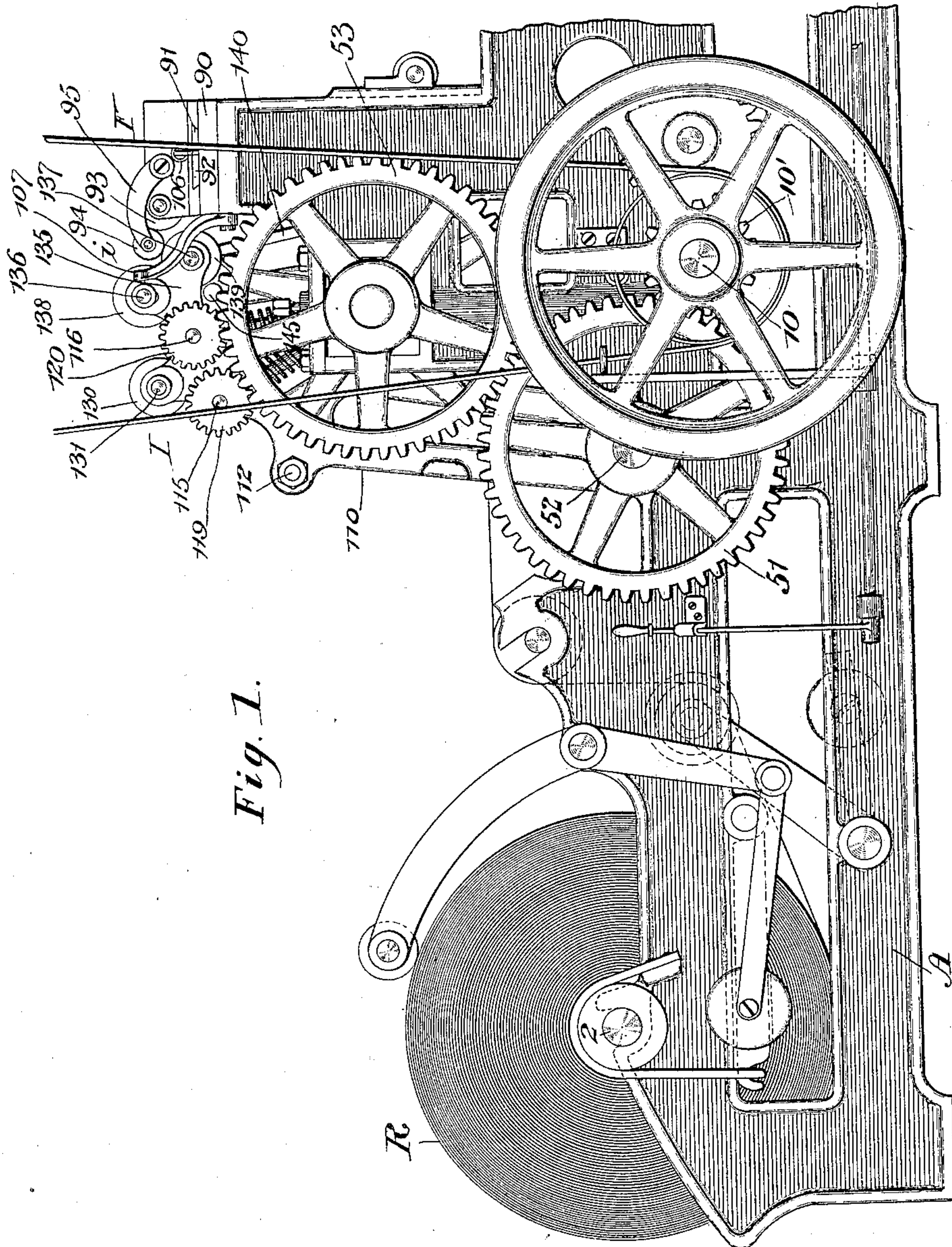


Fig. 1.

Witnesses.

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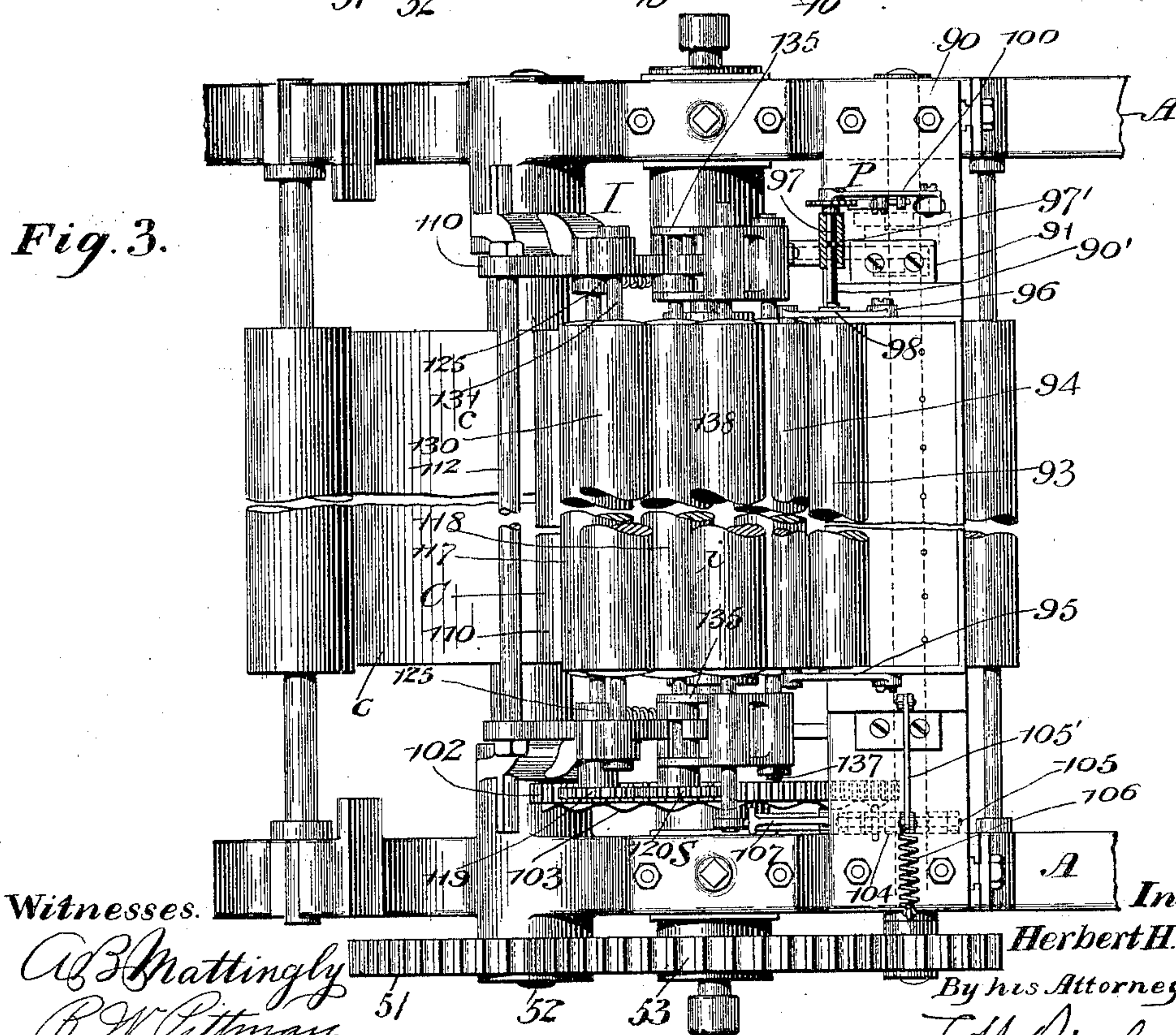
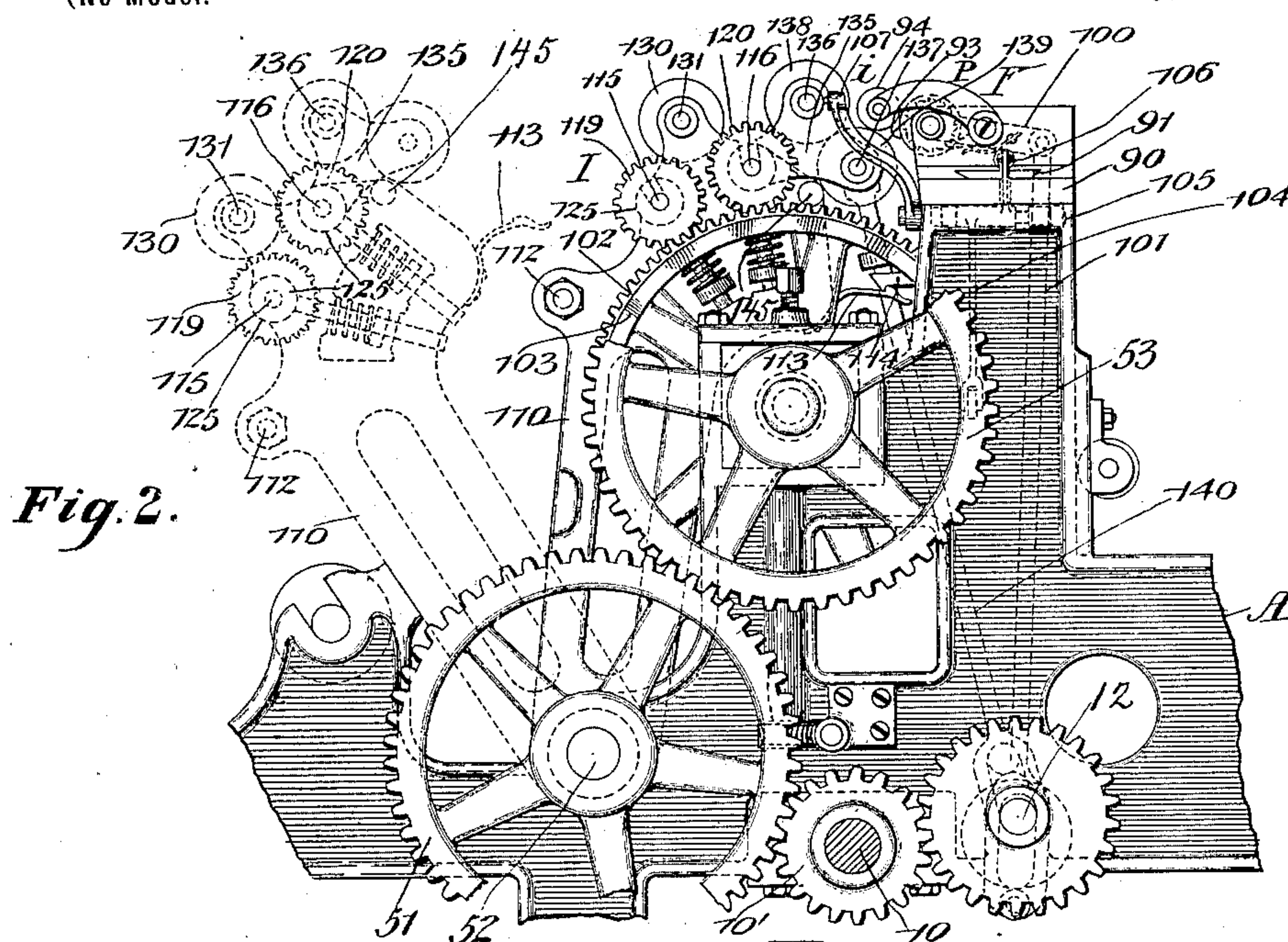
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3 Sheets—Sheet 2.



Witnesses.

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Fig. 4.

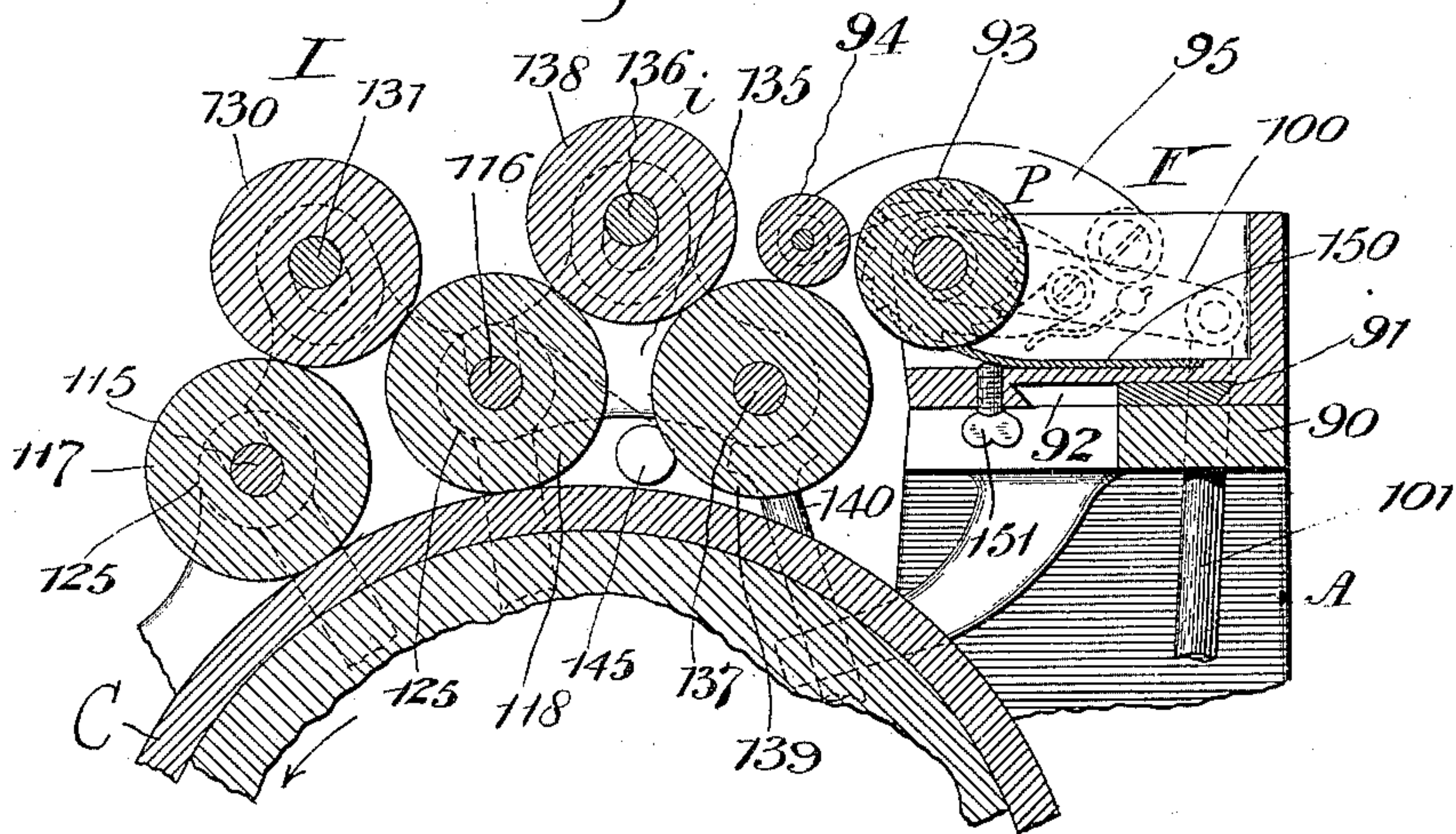
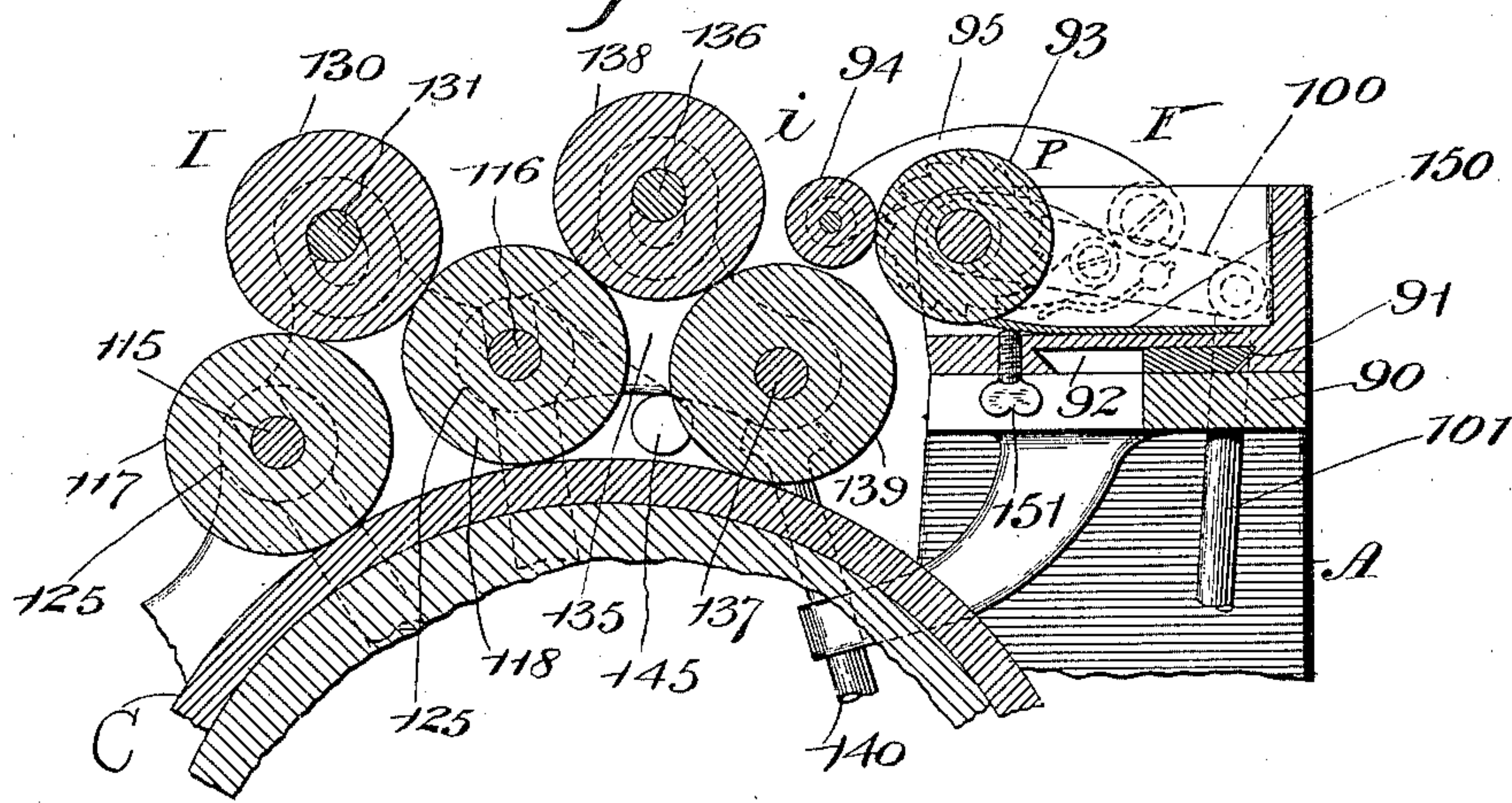


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

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INKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 652,113, dated June 19, 1900.

Application filed September 8, 1899. Serial No. 729,798. (No model.)

To all whom it may concern:

Be it known that I, HERBERT H. JACOBUS, a citizen of the United States, residing in Cedar Grove, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Inking Apparatus for Printing-Machines, of which the following is a specification.

This invention relates to improvements in inking apparatus for printing-machines; and it has for its main objects the provision of an improved apparatus of this class by means of which ink may be transferred from a suitable supply-fountain and thoroughly and uniformly distributed over all of the rollers of the inking apparatus and to facilitate the transfer of the ink from the receiving-roller to the more remote rollers of the inking apparatus.

In order to obtain the above results, I make use of an inking apparatus made up of a main inking device and a second inking device carried on the main one and movable relatively thereto, this second inking device being preferably so constructed that one of its inking-rollers will always be in contact with one of the rollers on the main inking device and yet will have a movement other than the ordinary movement of rotation which serves to permit the transfer of the ink from the one roller to the other. In the present case both the main and the second inking devices are oscillatory, the second one being mounted for oscillation as a whole on the main inking device during the time when the latter has no movement as a whole. One of the rollers of this second inking device serves as a transfer-roller for taking the ink from the ordinary transfer-roller in contact with a ductor-roll at the ink-fountain, and this transfer-roll on the second inking device may not only serve to lead the ink-film onto the other rollers of the series, but may also be employed to apply ink directly to the printing cylinder or form with which the inking apparatus co-operates.

Other novel features of this inking apparatus not heretofore specifically referred to will be pointed out in the specification and are clearly shown in the accompanying drawings, in which—

Figure 1 is a side elevation of one end of a

printing-machine embodying an inking apparatus constructed in accordance with my present invention. Fig. 2 is a similar view of a portion of the same, illustrating the inking apparatus and its coacting devices in detail, parts being broken away in order to illustrate more clearly the construction. Fig. 3 is a sectional plan of the same broken in the center. Fig. 4 is an enlarged transverse section of the ink-fountain and the inking-rollers, illustrating one position of the latter for feeding ink; and Fig. 5 is a similar view illustrating another position of such rollers.

Similar characters of reference designate like parts in all the figures of the drawings.

My improved inking apparatus may be employed in connection with any suitable printing-machine—such, for instance, as that of which one end is shown in the drawings. In this case the supporting-framework embodies two heavy side frames or castings, such as A A, suitably connected and supporting at the left-hand end the material to be printed, which will usually be carried in the form of a large roll, such as R, suitably supported for rotation, as by a shaft 2. From this roll R the paper is fed by any suitable feeding mechanism (not shown) between a pair of impression members or printing-cylinders, the lower one of which may be carried on a shaft preferably driven by a pinion on the main driving-shaft 10 of the printing-machine. The pinion 10' on the shaft 10 will in this case drive the lower impression-cylinder c directly through the medium of a large spur-gear 51, carried by a shaft 52, suitably journaled in the side frames A A, and the movement of the gear 51 will be transmitted to a gear 53 of the same size on one part of a rotary member or shaft S, which will preferably be mounted in such a manner as to be capable of adjustment toward and from the shaft 52 in order that the surfaces of the two printing-cylinders C and c may be shifted toward or from each other to control the impression or inspect the work. In addition to this it is also desirable that the upper cylinder C, which in this case is the main or printing cylinder proper, should be capable of removal from the machine readily in order to permit the insertion of a cylinder without disturbing the remainder of the mechanism.

The inking apparatus embodies two essential elements, one of which is the ink-fountain and its cooperating parts and the other the ink-rollers and devices cooperative with the printing-cylinder, to which rollers the ink is transferred from the fountain. The ink-fountain may be of any suitable construction, but I will usually employ a fountain, such as that designated in a general way by F, capable of reciprocation endwise on a support or cross-bar 90, connecting the two side frames A A, so that when the ink is deposited by the transfer-roll onto the form-roller it is also simultaneously "drawn" thereon and in this manner distributed so as to cover the surface of the form-roller longitudinally thereof, a feature which is of especial advantage in newspaper-work, where the cheaper inks are used and where the ductor-scrapers must be frequently adjusted to prevent "lumping" on the form-roller. The connection between the fountain and the cross-beam 90 may be made in any suitable way; but I prefer to mount said fountain on a dovetailed guide, such as 91, bolted to the cross-beam in such a manner as to be removable therefrom toward the right-hand side, as seen in Fig. 3. On this dovetailed guide 91 the fountain may reciprocate endwise, it having in this case a cooperating dovetailed guideway 92 in its under side. This ink-fountain supports therein the usual ductor-roll 93, and a transfer-roll 94 is journaled in the ends of a pair of links 95 and 96, pivoted to opposite sides of the fountain. This transfer-roll will make contact alternately with the ductor-roll and with another roller of the inking apparatus to transfer ink to the latter. The ductor-roll should, of course, turn to lead the ink to the transfer-roll 94, and an intermittent step-by-step rotary movement may be imparted thereto in any suitable manner, as by means of a suitable pawl-and-ratchet connection, (indicated in a general way by *p*,) the ratchet-wheel being secured to a short shaft 97, journaled in a suitable bearing and having at its opposite end a squared longitudinal bore, such as 97', in which a correspondingly-squared end 90' of the ductor-roll shaft 98 may slide as the ink-fountain reciprocates. The link 100, by which motion is communicated to the pawl-and-ratchet connection *p*, may be connected by a suitable spring-pressed rod, such as 101, to the shaft 12 and suitably operated by a cam or wiper thereon, the spring serving to return the parts to their normal positions.

The reciprocatory movement of the ink-fountain may be obtained in any suitable manner; but in this instance a large spur-gear 102 on the shaft S has on one side thereof a circuit of projections and depressions forming a crown-cam, (designated herein by 103,) with which cooperates an antifriction-roll on the end of a lever 104, carried by a shaft 105, suitably journaled in the framework. At its upper end this lever 104 may be connected by a link, such as 105', directly to the ink-

fountain to shift the same in one direction, a suitable spring, such as 106, being employed to effect the return movement of said fountain. Another lever-arm, such as that shown at 107, formed substantially as a shipping-lever, may be secured to the shaft 105 and may serve to impart a reciprocatory movement to one of the inking-rollers which cooperates with the printing-cylinder.

In order to permit access to the cylinder C, especially in removing the latter, I prefer to employ an inking device shiftable toward and away from said cylinder, and the main inking device, which is indicated in a general way by I, may be supported for oscillation on the bearings of the shaft 52. This main inking device will usually embody a pair of side frames or rock-arms, such as 110, which may be connected by a rod 112, and the main inking-frame may be secured in its working position by a latch and a detent, such as 113 and 114.

Any desired number of inking-rollers may be supported on the rock-arms 110, and they may be mounted in any desired manner; but I prefer to support thereon two shafts, such as 115 and 116, carrying inking-rollers 117 and 118, these shafts being geared directly to the spur-gear 102 by pinions 119 and 120. The shafts 115 and 116 are not in this case, however, journaled directly in the rock-arms 110, but are preferably carried at their opposite ends by yielding bearings, all of which are of the same construction. By referring to Figs. 2 and 3 it will be seen that these shafts are journaled directly in spring-pressed bearings, such as 125, suitably guided in the rock-arms 110, and that the bearings in the latter are open at their upper sides in order to permit the shafts to be removed readily with their yielding bearings. A third frictionally-driven ink-roller, such as 130, in contact with the ink-rollers 117 and 118, is carried by a shaft 131 in transversely-elongated bearings in the rock-arms 110.

In addition to the parts just described the main inking device will preferably carry a second inking device supported thereon for oscillation relatively thereto, and in this case the shaft 116 may form the support for the second inking device, this latter having oscillatory side plates or links, such as 135, connected, as by the shafts of the inking-rollers, to form a suitable frame, said side plates or links having proper bearings for ink-roller shafts. Here two of these shafts are journaled directly in such side plates, said shafts being designated by 136 and 137 and carrying corresponding ink-rollers 138 and 139. The shaft 136 may be supported for reciprocation in its bearings and may be reciprocated by the lever 107, hereinbefore mentioned. (See Fig. 3.) Moreover, the bearings for this shaft may also be transversely elongated, as are those of the shaft 131.

The ink-roller 138 is frictionally driven by contact with the ink-rollers 118 and 139, the

latter of which oscillates with the second inking device *i* toward and from the surface of the printing-cylinder. When in its raised or receiving position, this inking-roller 139, which is practically driven from the printing-cylinder, will receive ink from the transfer-roll 94 when the latter is traveling bodily with the ink-fountain during its reciprocation on the ways 29, and since the roller 94 is when in its raised position out of contact with the fountain-roller 93 and in contact with the rotating form-roller 139 ink will be deposited and drawn on the latter at different points of its surface and spread by the roller 138. It will thus be seen that the ink on the roller 139 is distributed thereon to some extent preparatory to the descent and subsequent contact thereof with the form on the cylinder and that a comparatively great amount of ink is deposited on the form to be spread thereon by the rollers 118 and 117 as the form comes into contact with the same. When the roller 139 is in its "inking" position, as shown in Fig. 5, the transfer-roll 94 is entirely clear of the same and in contact with the fountain-roll to receive a fresh supply therefrom.

The oscillatory movements of the device *i* may be obtained in any suitable manner—as, for example, from a rod 140 engaging, but not connected to, some suitable portion of said device *i*, this rod being preferably guided at its upper end, while the lower end thereof may be operated from the shaft 12 by a cam on the latter, the weight of the inking device serving to impart the return stroke to the rod 140.

In order to limit the movement of the inking device *i* relatively to the main device *I*, the latter may have thereon a fixed stop 145 in position to engage some suitable member of the device *i* when the main and second inking devices are thrown back to the position shown in dotted lines in Fig. 2.

The bottom plate or ductor of the ink-fountain, which plate is indicated herein by 150, may be adjusted at its feed end relatively to the ductor-roll by suitable adjusting-screws, such as 151, in order to control the thickness of the ink-film led off by the ductor-roll.

The operation of my improved inking apparatus may be briefly stated as follows, viz: Ductor-roll 93 is intermittently turned by the connections described, and the periphery thereof takes up ink from the fountain *F*. When rollers 117, 118, and 139 are in contact with the printing roller or cylinder *c*, as shown in Fig. 5, the transfer-roll 94 is free from contact with roll 139 and its periphery is in engagement with that of the ductor-roll 93 and receives a layer or coating of ink therefrom, and this ink is transferred to and spread upon the roll 139 when said roll is thrown into contact with the transfer-roll 94, as shown in Fig. 4, and from the roll 139 it is conveyed to the inking-roller 118 by inter-

mediate roll 138 and from said roll 118 to inking-roll 117 by the intermediate roller 130. In this way all of the form or inking rolls are properly and evenly coated with ink in order that the same may be transferred to the form upon the cylinder which rotates beneath them.

Should it be desired at any time to expose the cylinder carrying the form for any purpose, latch 113 is released from catch 114 and the arms 110, in which the inking-rollers are journaled, are swung to the position shown by dotted lines in Fig. 2.

By reciprocating rolls 94 and 138 in the manner described the ink is evenly distributed upon the rollers 118 and 139, and is consequently in the proper condition to be applied to the form.

Having described my invention, I claim—

1. In a printing-machine, the combination, with a printing member, of an ink-fountain; a ductor-roll; an oscillatory transfer-roll; an oscillatory inking device cooperative with the printing member and embodying a second transfer-roll oscillatory between the first transfer-roll and the printing member; and means for oscillating the inking device.

2. In a printing-machine, the combination, with a printing member, of an ink-fountain; a ductor-roll; an oscillatory transfer-roll; an oscillatory inking device cooperative with the printing member and embodying a plurality of contacting inking-rollers, one of which is a transfer-roll and is oscillatory between the first transfer-roll and the printing member; and means for oscillating the inking device.

3. In a printing-machine, the combination, with a printing member, of an ink-fountain; a ductor-roll; an oscillatory gravitative transfer-roll movable into and out of contact with the ductor-roll; an oscillatory inking device cooperative with the printing member and operative for raising the gravitative transfer-roll from the ductor-roll, and embodying a plurality of contacting inking-rollers one of which is a transfer-roll and is oscillatory between the first transfer-roll and the printing member; and means for oscillating the inking device.

4. In a printing-machine, the combination, with a printing-cylinder, and with means for rotating the same, of an ink-fountain; a ductor-roll; an oscillatory transfer-roll; an oscillatory inking device cooperative with the printing member and embodying a plurality of contacting inking-rollers one of which is a transfer-roll and is oscillatory between the first transfer-roll and the printing member, and another of which is geared for rotation in unison with the printing-cylinder; and means for oscillating the inking device.

5. In a printing-machine, the combination, with a removable printing-cylinder, and with means for rotating the same, of an ink-fountain; a ductor-roll; an oscillatory transfer-roll; a main inking device shiftable toward

and away from the printing-cylinder to permit the removal of the latter, and embodying an oscillatory second inking device coöperative with the printing-cylinder, said oscillatory inking device having a second transfer-roll oscillatory between the first transfer-roll and the printing-cylinder and coöperative with other inking-rollers of the main and second inking devices; and means for oscillating such second inking device.

6. In a printing-machine, the combination, with a removable printing-cylinder, and with means for rotating the same, of an ink-fountain; a ductor-roll; an oscillatory transfer-roll; a main inking device oscillatory toward and away from the printing-cylinder to permit the removal of the latter, and embodying an oscillatory second inking device coöperative with the printing-cylinder, said second oscillatory inking device having a second transfer-roll oscillatory between the first transfer-roll and the printing-cylinder and coöperative with other inking-rollers of the main and second inking devices; and means for oscillating such second inking device.

7. In a printing-machine, the combination, with a printing member, of an ink-fountain; a ductor-roll; an oscillatory transfer-roll; an oscillatory inking device coöperative with the printing member and embodying a plurality of contacting inking-rollers one of which is a transfer-roll and is oscillatory between the first transfer-roll and the printing member; means for oscillating the inking device; and means for reciprocating one of the inking-rollers of the inking device endwise.

8. In a printing-machine, the combination, with a printing member, of a reciprocatory ink-fountain; a ductor-roll reciprocatory endwise with said ink-fountain; an oscillatory transfer-roll also reciprocatory endwise with

said ink-fountain; means for reciprocating the ink-fountain; an oscillating inking device embodying a plurality of inking-rollers; and means for raising said transfer-roll out of contact with the ductor-roll by the oscillation of the inking device in one direction.

9. In a printing-machine, the combination, with a printing member, of a reciprocatory ink-fountain; a ductor-roll reciprocatory endwise with said ink-fountain; an oscillatory transfer-roll also reciprocatory endwise with said ink-fountain; an oscillatory inking device coöperative with the printing member and embodying a plurality of contacting inking-rollers one of which is a transfer-roll and is oscillatory between the first transfer-roll and the printing member and another of which is reciprocatory endwise; means for oscillating the inking device; and means for reciprocating the ink-fountain and said reciprocatory inking-roller of the inking device.

10. In a printing-machine, the combination, with a printing-cylinder, and with means for rotating the same, of an ink-fountain; a ductor-roll; an oscillatory transfer-roll; an oscillatory inking device coöperative with the printing-cylinder and embodying a plurality of contacting inking-rollers one of which is a transfer-roll and is oscillatory between the first transfer-roll and the printing-cylinder and another of which is geared to move in unison with the printing-cylinder, said last-mentioned inking-roller also having yielding bearings spring-pressed toward the axis of the printing-cylinder; and means for oscillating the inking device.

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