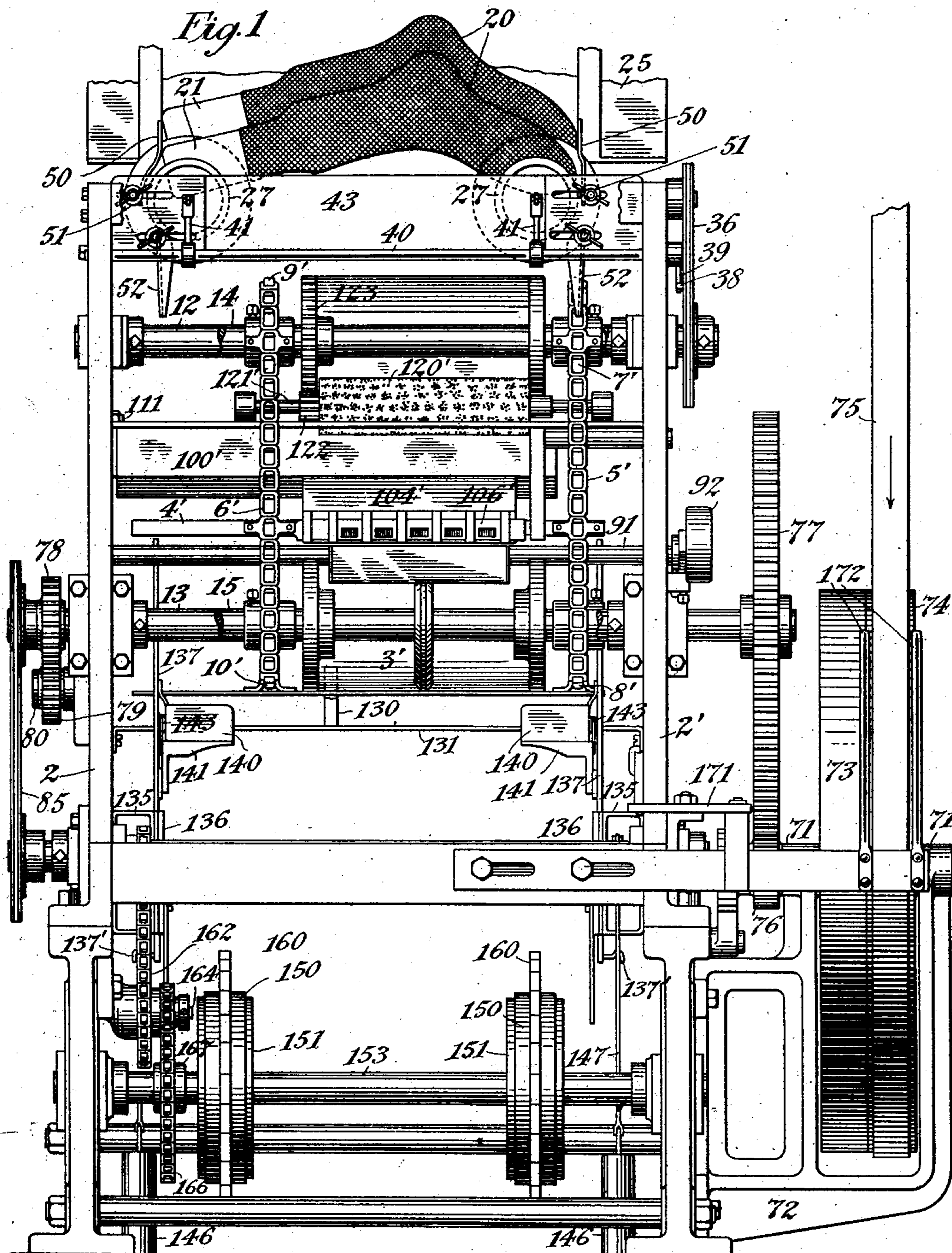


R. BAIRD.
HOSIERY PRINTING MACHINE.

APPLICATION FILED JUNE 24, 1902.

NO MODEL.

6 SHEETS—SHEET 1.



Witnesses:
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No. 747,355.

PATENTED DEC. 22, 1903.

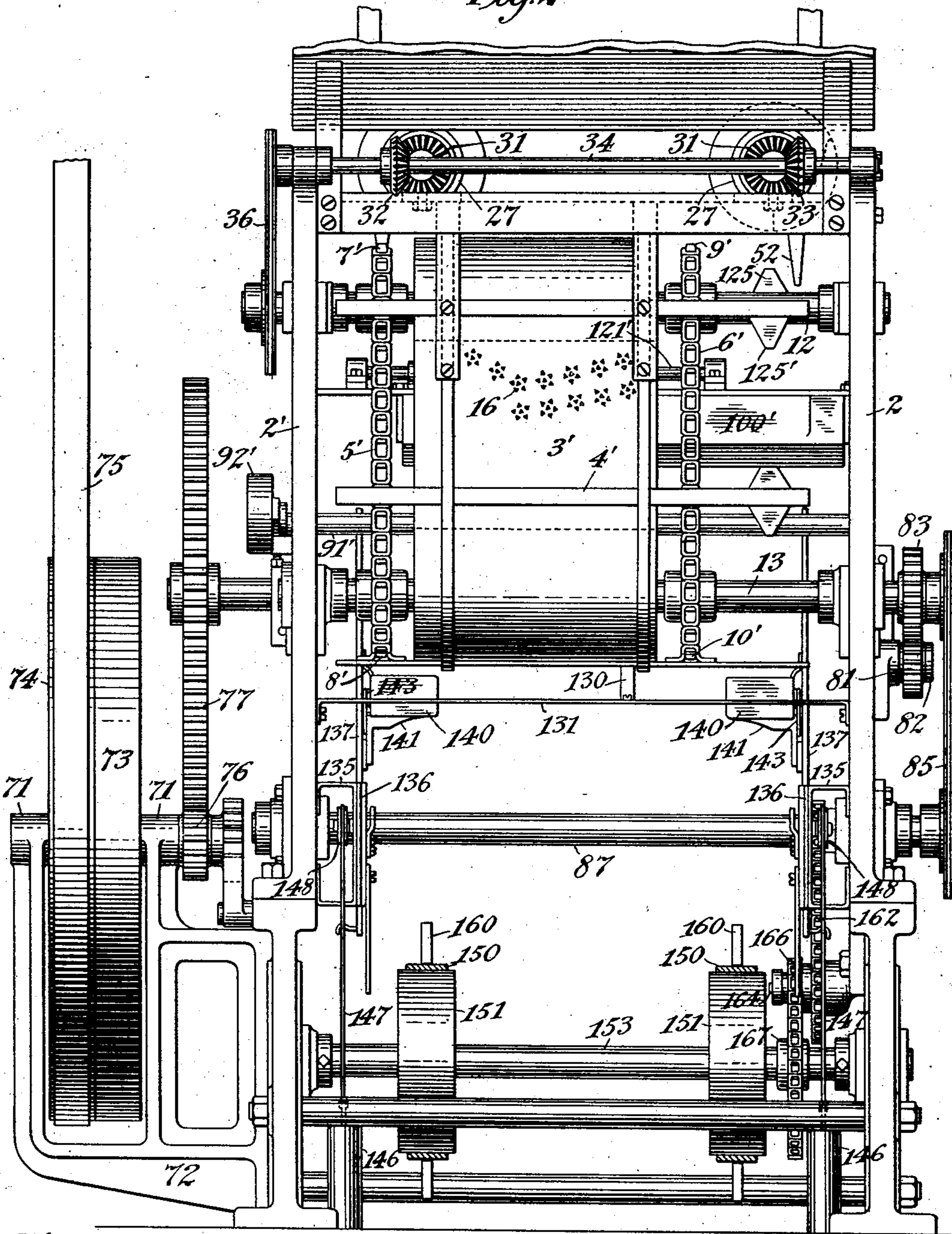
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6 SHEETS—SHEET 2.

Fig. 2



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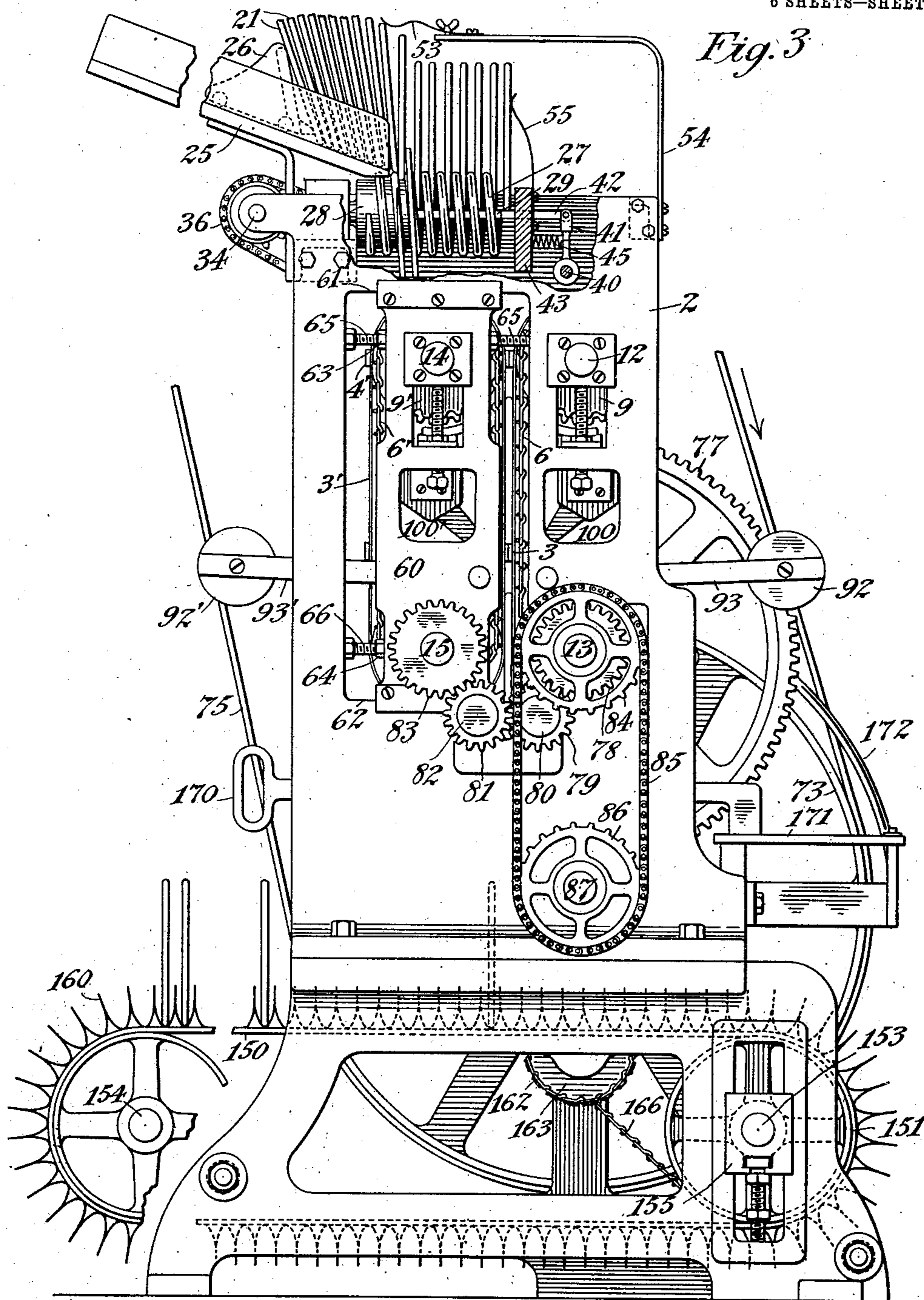
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NO MODEL.

6 SHEETS—SHEET 3.



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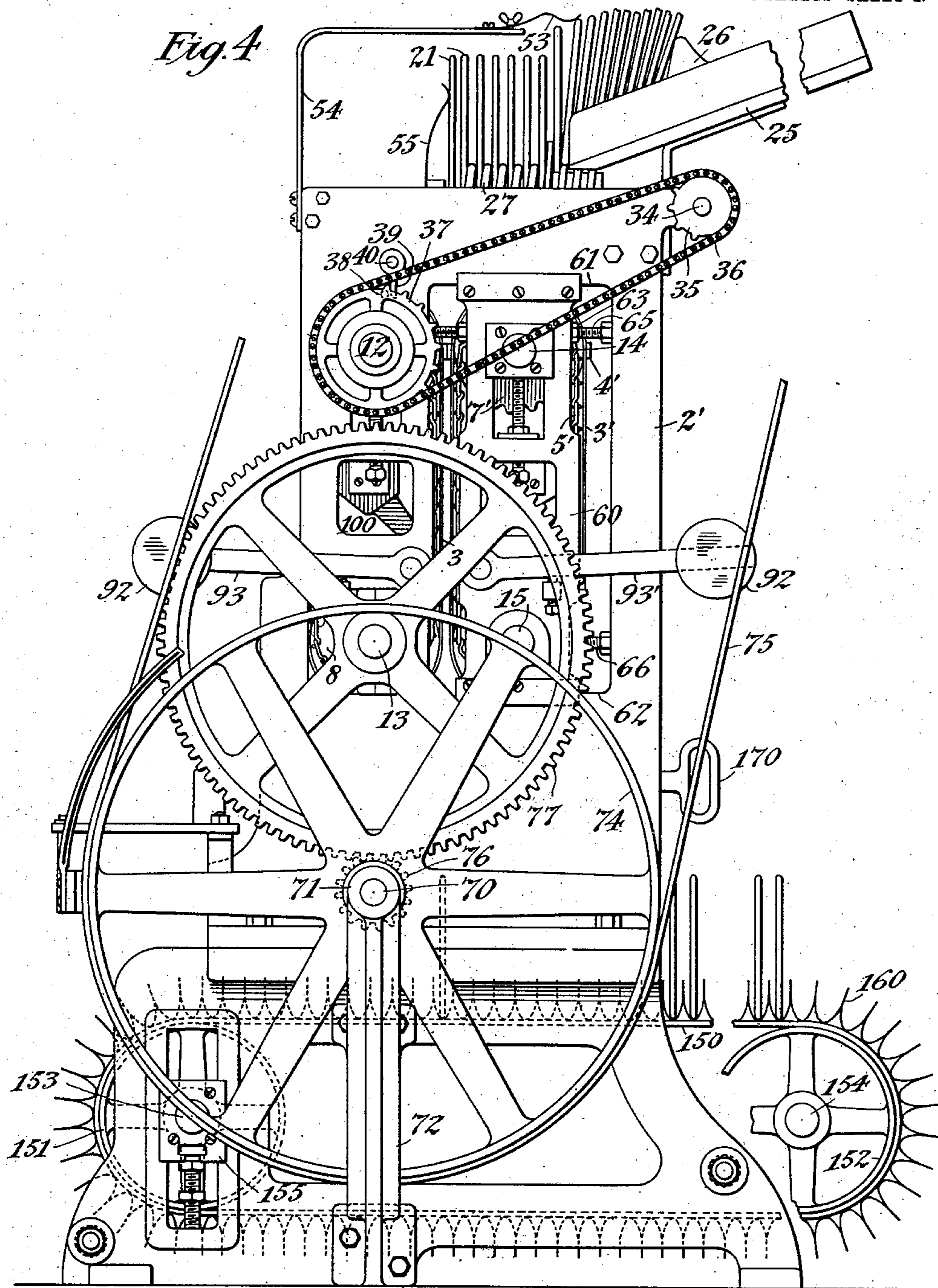
PATENTED DEC. 22, 1903.

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APPLICATION FILED JUNE 24, 1902.

NO MODEL.

6 SHEETS—SHEET 4.



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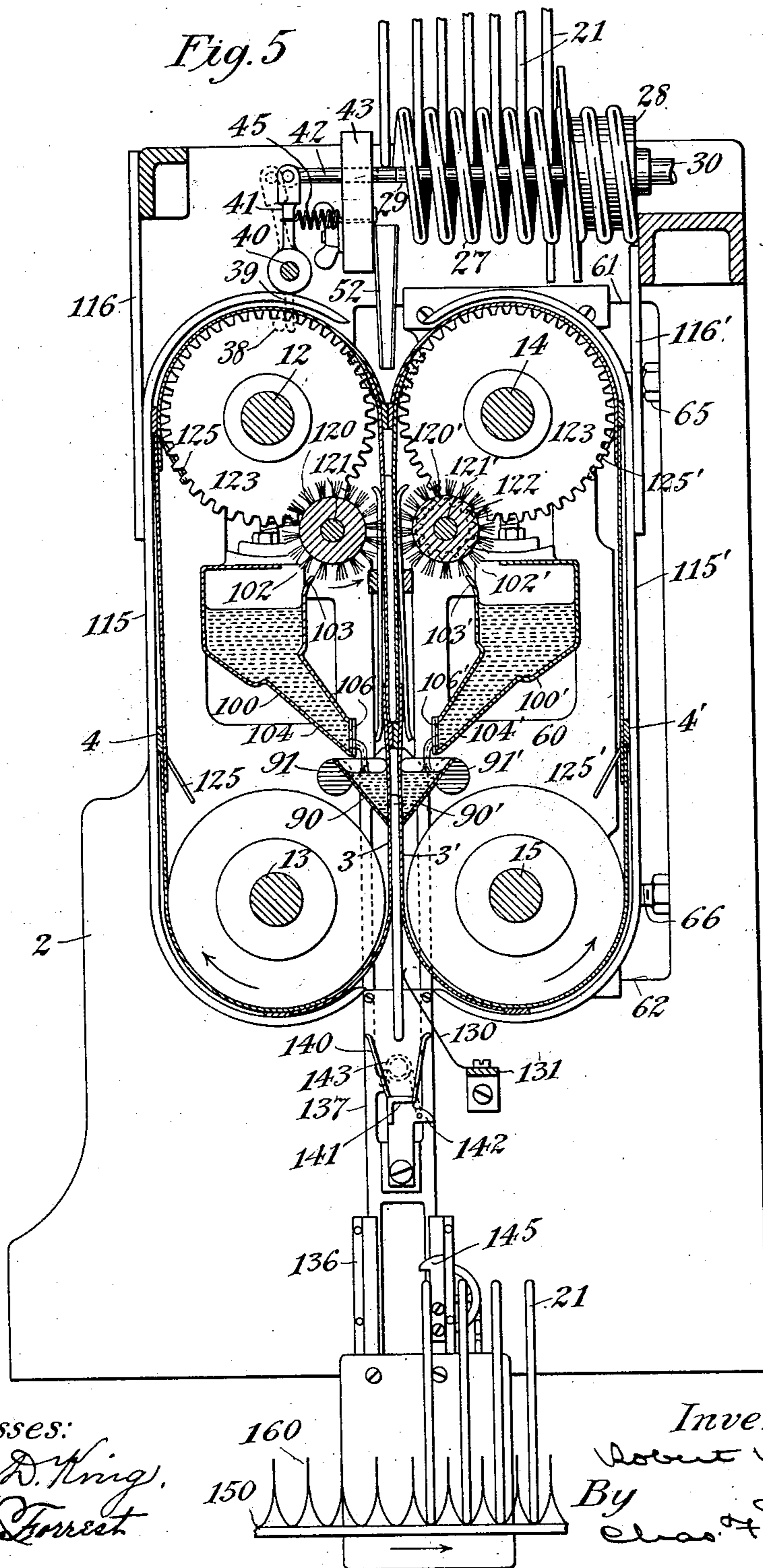
PATENTED DEC. 22, 1903.

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HOSIERY PRINTING MACHINE.

APPLICATION FILED JUNE 24, 1902.

NO MODEL.

6 SHEETS—SHEET 5.



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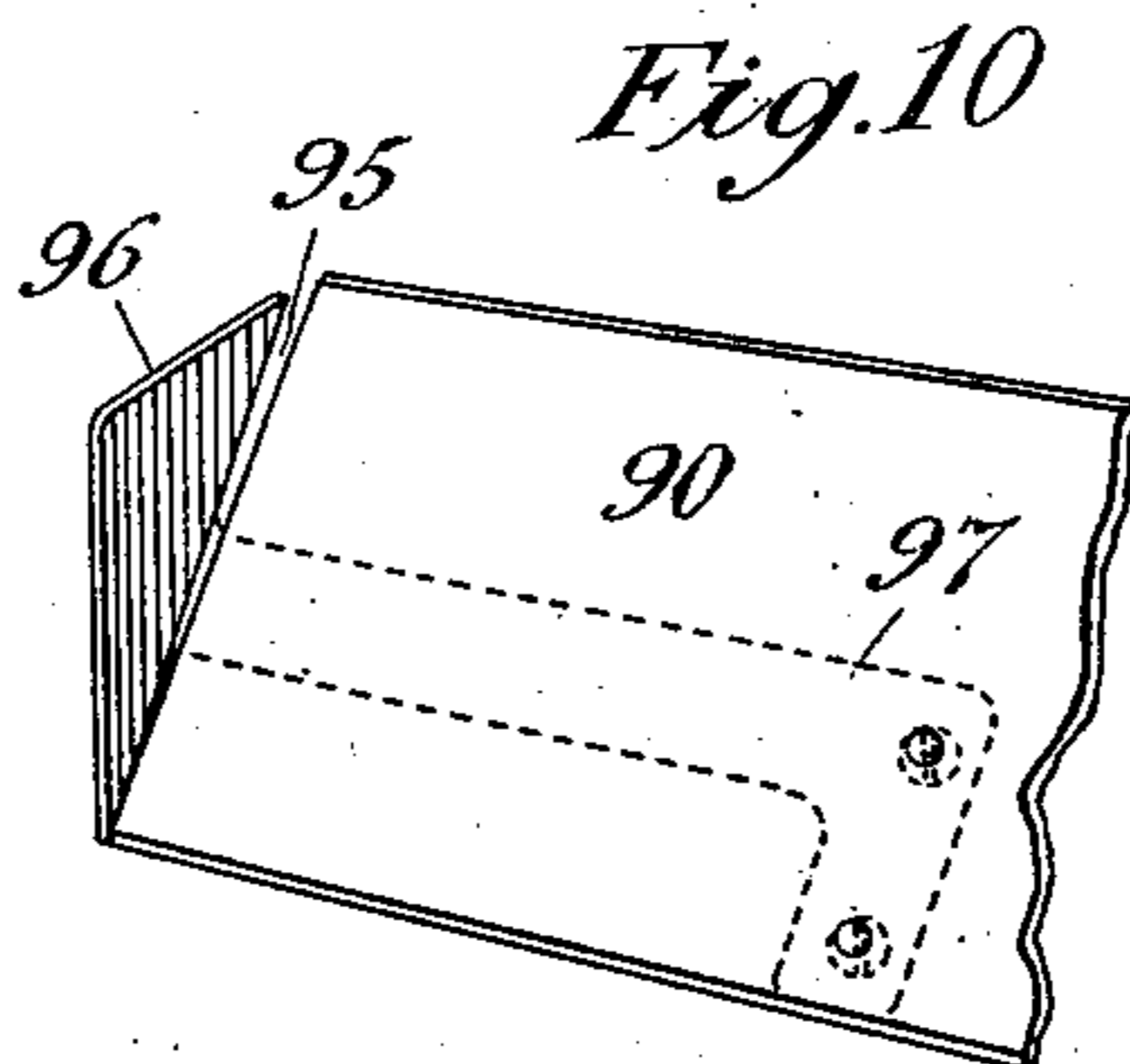
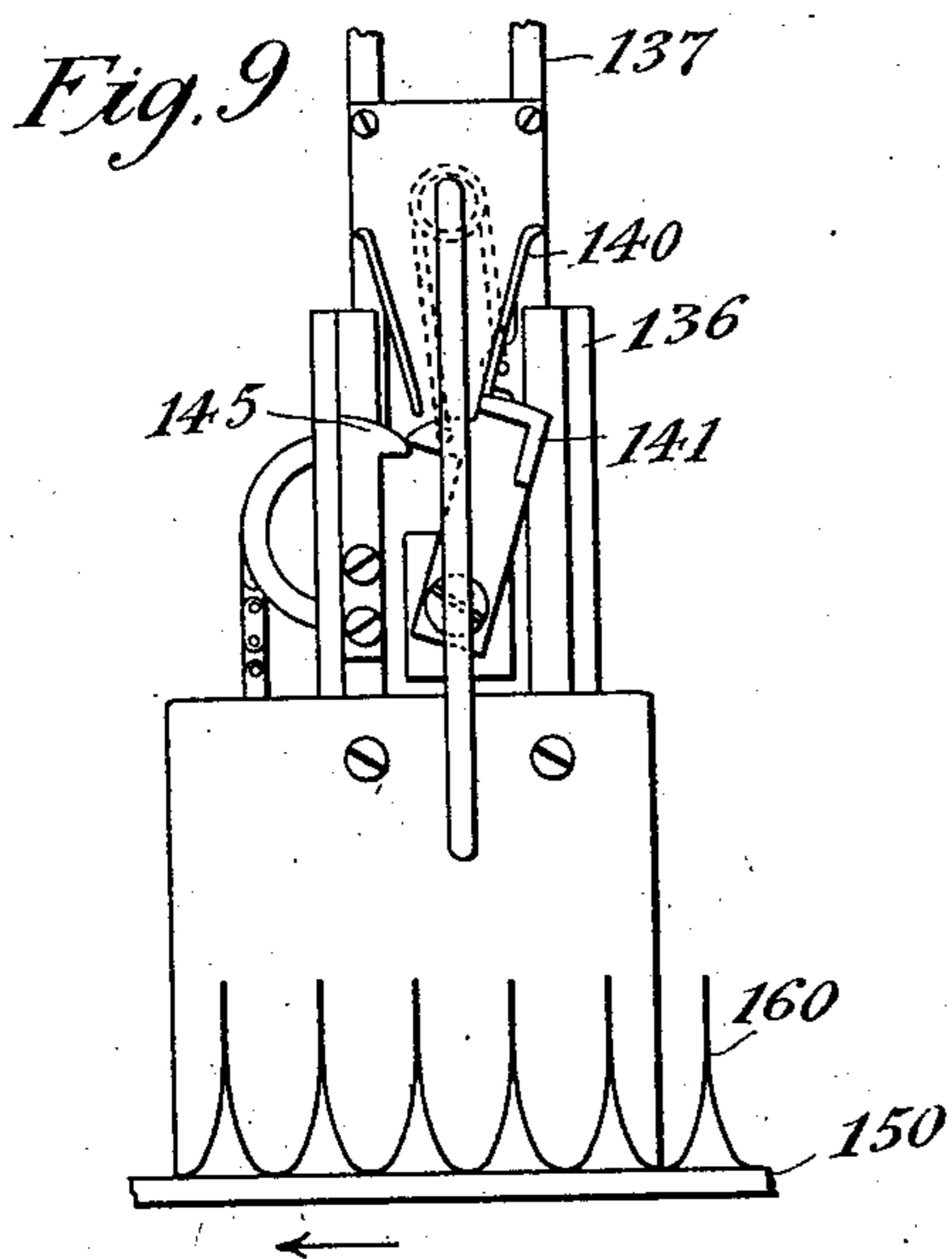
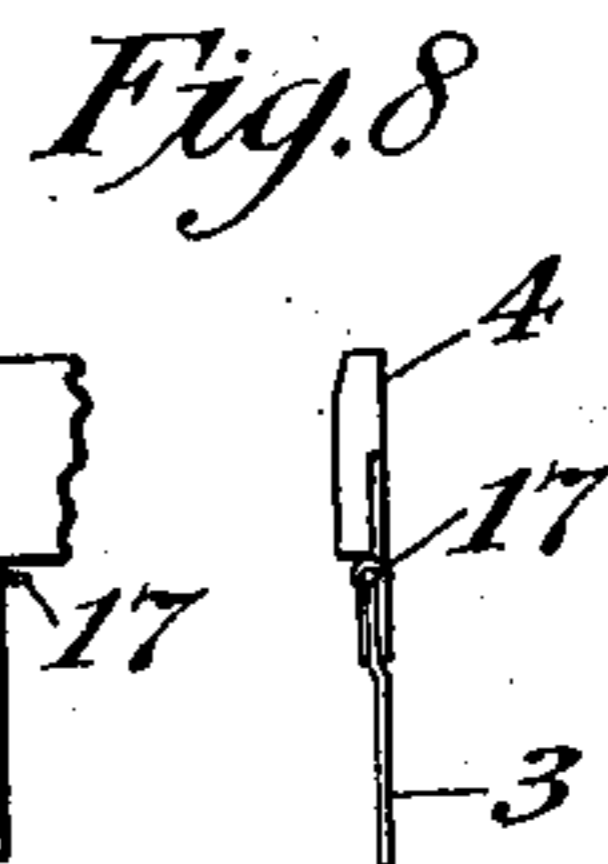
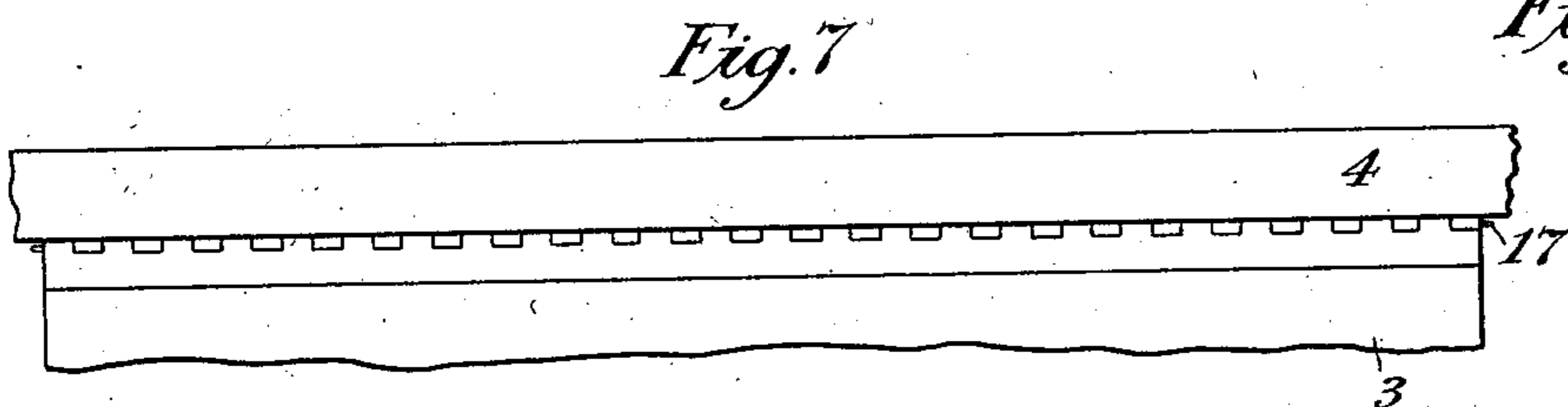
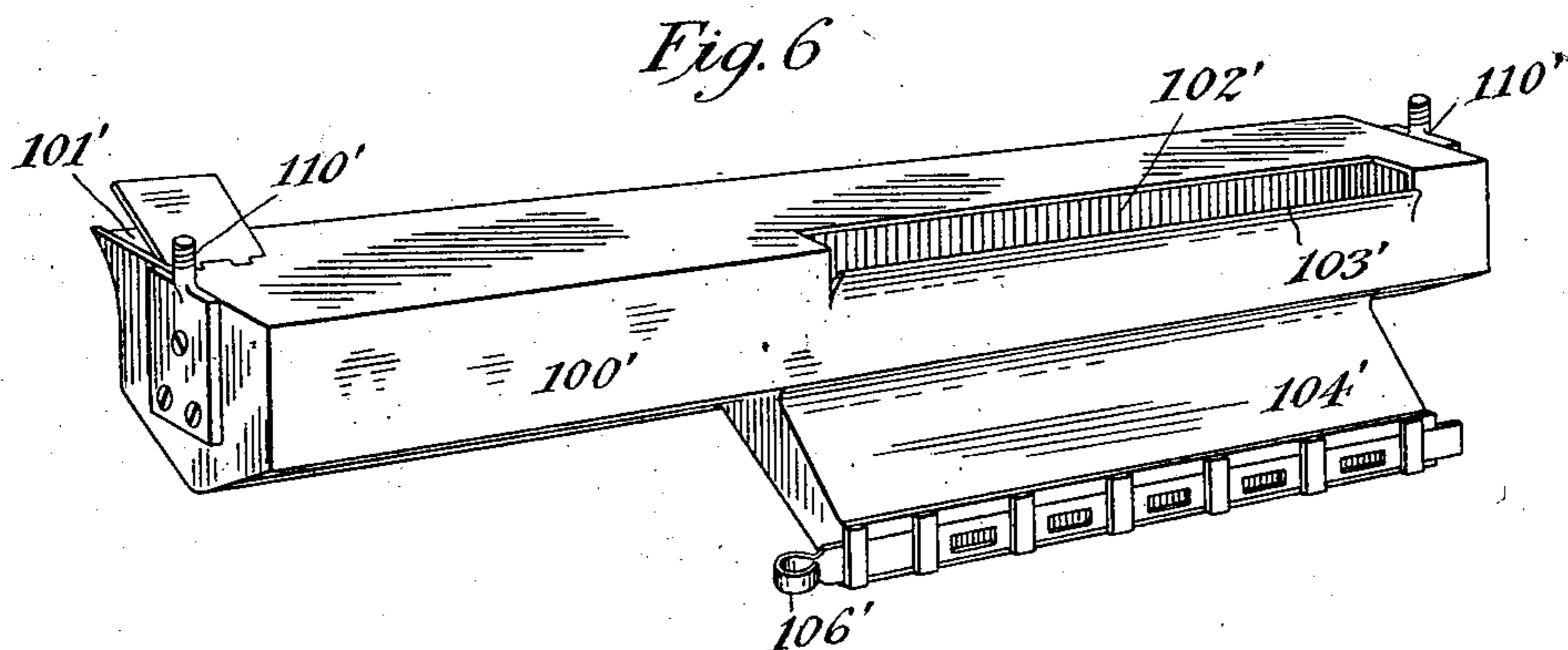
PATENTED DEC. 22, 1903.

R. BAIRD.
HOSIERY PRINTING MACHINE.

APPLICATION FILED JUNE 24, 1902.

NO MODEL.

6 SHEETS—SHEET 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

ROBERT BAIRD, OF WEST ORANGE, NEW JERSEY.

HOSIERY-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 747,355, dated December 22, 1903.

Application filed June 24, 1902. Serial No. 113,046. (No model.)

To all whom it may concern:

Be it known that I, ROBERT BAIRD, a subject of the King of Great Britain, residing at West Orange, Essex county, State of New Jersey, have invented certain new and useful Improvements in Hosiery-Printing Machines, of which the following is a specification.

This invention relates to hosiery-printing machines; and its main object is to provide a machine by means of which half-hose, stockings, and other articles may have applied thereto a printed ornamentation of any required design.

In carrying the invention into effect I make use of a pattern member having stencil-openings therein representing a pattern or ornamentation to be printed on the article, the printing operation being effected by supplying ink through the stencil-openings to the surface of the article. In the preferred construction duplex pattern members and inking devices will be employed in order to permit the printing of both sides of the hosiery or other articles at one operation, in which case the hosiery or other article stretched on form-boards will be fed into position between a pair of pattern members or pattern-belts, inked or printed on both sides simultaneously, and shifted away by suitable mechanism after the printing operation is finished, endless pattern-belts being preferably employed in order to feed the form-boards, with the hosiery or other article stretched thereon, through the machine one after the other while such articles are being printed. These belts have their working runs so close together that they are held firmly in contact with opposite sides of the article to be printed during the travel of such article through the machine. Moreover, during the printing period the pattern member or the working portion of the pattern-belt preferably travels downward in a substantially vertical direction, and the ink is fed by gravity through the backs of the openings of the patterns onto both sides of the article.

Another feature of the invention is the provision of means for cleaning the pattern member or pattern-belt to remove ink adhering thereto after each stencil-opening has performed its work and before a new supply of ink is fed therethrough. This cleaning means

is usually a brush, and it is preferably so located as to be capable of performing the additional and important function of forcing the surplus ink from one printing operation through the stencil-openings at the beginning of the next printing from such pattern and applying such surplus ink to a succeeding article as the first coat or layer of ink, the main layer or film being afterward applied directly from the main ink-supply in the manner hereinbefore described. It should be noted here that the term "ink" is employed to indicate any substance suitable for printing the articles, whether it be the ordinary ink or size, pigment, or other substance.

In printing articles stretched on form-boards suitable provision must be made for feeding the same to and away from the pattern members, and the devices employed for this purpose are important elements of this machine. The feeding of the articles to the printing mechanism may be accomplished by means of a force-feeder or feed-screw so constructed as to space the form-boards at equal intervals and advance them one by one into the space between the pattern members, while suitable conveying mechanism embodying a transferring device controlled by the travel of the pattern members may be employed to remove the printed articles.

These features of my invention and others not hereinbefore mentioned, but which will be hereinafter described, are illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a hosiery-printing machine constructed in accordance with my invention with parts broken away to show the construction clearly. Fig. 2 is a rear elevation of the same, partly in section. Fig. 3 is a side elevation of the machine as viewed from the left in Fig. 1 with parts removed and with the feed-board and conveyer broken in the center. Fig. 4 is a similar view of the opposite end of the machine. Fig. 5 is an enlarged vertical substantially central section of the principal parts of the feeding, printing, and transferring devices. Fig. 6 is an enlarged perspective view of one of the ink-reservoirs. Fig. 7 is a detail illustrating in side elevation the manner in which a pattern-member is secured to a cross-bar of the feed-belt. Fig. 8 is an

end view of said detail. Fig. 9 is an enlarged detail of the transferring device in its position for releasing a printed article. Fig. 10 is a detail illustrating in perspective a yielding end wall of the ink-trough.

Similar characters designate like parts in the different figures of the drawings.

The various cooperating parts of the machine may be mounted in any proper manner on a suitable framework; but I prefer to locate the feeding means above and the transferring and conveying devices below, a vertically-disposed printing mechanism supported by and between a pair of end frames, such as 2 and 2', here made in sections and connected by suitable cross-frames and tie-rods. As before stated, the stenciling means will embody one or more pattern members, preferably in the form of endless pattern-belts, and two of these pattern-belts are shown herein. In order to provide for positive location of each group of stencil-openings at each operation, it is desirable to make use of a plurality of pattern members or sheets, such as 3 and 3', and to secure these directly to cross-bars, such as 4 and 4', fastened, preferably, at equal distances apart to the sprocket-chains, such as 5 and 6, and 5' and 6', traveling around sprocket-wheels, such as 7, 8, 9, and 10 and 7', 8', 9', and 10', carried by shafts, such as 12, 13, 14, and 15, journaled in suitable bearings in the main side frames 2 and 2' and in a sliding carrier, which will be hereinafter described. Each of the pattern members 3 and 3' is preferably a wide sheet of zinc, brass, steel, or other suitable material, having stencil-openings therein of such contour as to form the desired stenciled ornamentation on opposite sides of the material to be printed. In the preferred construction the upper edge is turned over and cut away to form a long hinge-knuckle, through which is passed a pin 17, which also passes through a complementary hinge member, carried by the corresponding cross-bar 4 or 4'. (See Figs. 7 and 8.)

In connection with the printing mechanism I employ suitable feeding means, preferably a force-feeder in the form of a feed-screw, for feeding the articles to be printed successively into the vertical plane of the working runs of the pattern-belt. The articles so fed are in this case half-hose, such as 20, stretched on form-boards, such as 21, all preferably of the same size and shape, and these form-boards control the movements of the articles to be printed and are themselves the articles directly controlled and manipulated by the feed mechanism and the other operating devices. These form-boards 21 are preferably supplied by an inclined feed-board or feed-trough 25, (see Figs. 3 and 4,) having a weighted follower 26 therein to push the form-boards forward to an article-spacing feed-screw 27, which in this case is a heavy coiled spring secured to and surrounding a hub 28, having a central rod 29 projecting therefrom and ex-

tending through the center of the coils of the spring 27. In order to feed both ends of the form-boards evenly, the construction just described is duplicated at the other end of the machine, both of said feed screws or springs being turned in the same direction by suitable gearing. Here the springs 27 and the hubs 28 are secured to shafts 30, mounted in bearings at the rear upper end of the machine and carry bevel-gears 31, (see Fig. 2,) meshing with corresponding bevel-gears 32 and 33 on a shaft 34, journaled at its ends in the tops of the side frames 2 and 2' and receiving motion from the sprocket-chain 36, passing around a sprocket-pinion 35 on the shaft 34 and around a larger sprocket-wheel 37, secured to the forward upper shaft 12 for the pattern-belt that is supported directly by the side frames 2 and 2'. The sprocket-wheel 37 may also serve as the means for releasing the form-boards one by one as they reach the forward ends of the feed-screws 27. In this construction said sprocket-wheel has a pin 38 projecting laterally therefrom into the path of a rock-arm 39, depending from a rock-shaft 40, journaled at its opposite ends in the side frames 2 and 2' and having a pair of rock-arms 41 rising therefrom in the vertical planes of the rods 29, these rock-arms being pivoted at their upper ends to the ends of rods 42, mounted to slide in openings in the upper cross-bar 43 of the framework. When in the position shown in Fig. 3, the slides 42 form continuations of the rods 29, and the adjacent ends of the rods 29 and 42 support the foremost form-boards positioned by the feed-screw. The form-board 21 at the extreme forward end of the row rests on the rear ends of the slides 42, and when said slides are moved forward to the position shown in dotted lines in Fig. 5 the slides cease to support said board and a narrow opening is formed, through which the foremost board drops into engagement with the working runs of the pattern-belts. The form-boards are preferably guided at their ends during their travel down the feed-trough and also while supported by the feed-screws and during their descent to the printing-point. In Fig. 1 I have illustrated at 50 end guides adjustable by the nuts 51 for different lengths of form-boards and similarly-adjustable converging end guides 52, preferably trough-shaped, to direct the falling board to the printing-point after the slides 42 are moved forward by the pin 38, it being understood that some suitable means, such as a spring 45, will immediately return such slides to their normal positions to form a support for the next form-board in the row. I have also shown at 53 on a bracket-arm 54 a spring for engaging the upper ends of the form-boards and preventing the toppling over of the same and a similar spring 55 at the extreme forward end of the row to support the foremost board until it is released by the slides 42.

From the foregoing it will be seen that the release of each form-board is controlled by the printing mechanism, and the cross-bars 4 and 4' are so spaced and project such a distance from the surfaces of the pattern-sheets as to close the space above a form-board each time one of the boards is fully engaged between the pattern members and prevent the engagement of a succeeding board with the one already engaged and also form a support for such succeeding board, as will be evident by referring to Fig. 5. Each board will of course be firmly engaged by and move in unison with the working runs of the pattern-belts while located between such runs.

The upper shafts 12 and 14 for the pattern-belts are preferably supported in vertically-adjustable bearings, and the shafts 14 and 15, with their sprocket-chains, pattern-sheets, and all coacting devices assembled directly therewith, are preferably mounted on a carrier shiftable toward the front or the rear of the machine to advance one pattern-belt into close proximity to the other or to withdraw it therefrom. This slide is designated by 60 and is guided at its upper and lower ends on ways formed by the walls 61 and 62 of openings in the side frames 2 and 2'. Adjusting-nuts, such as 63 and 64, on screw-bolts 65 and 66 are shown for determining the position of this sliding carrier 60.

Near the lower end of the main framework is a main driving-shaft 70, mounted in bearings 71 in a heavy bracket 72, secured to the side of the main framework, this shaft having thereon the usual fast and loose pulleys 73 and 74, coöperating with the driving-belt 75. The shaft 70 is a short one and has secured thereto a pinion 76, meshing with the large spur-gear 77 on one end of the shaft 13, which shaft therefore constitutes the direct means for driving one of the pattern-belts, the other belt being driven in this case by a gear-train at the opposite end of the machine from the spur-gear 77. Said gear-train consists of a spur-gear 78 on said opposite end of the shaft 13, the teeth of which gear are in mesh with those of the spur-pinion 79, mounted on a stud 80 on the framework, this pinion meshing in turn with another pinion 81, similarly mounted on a second stud 82 and meshing with a spur-gear 83 on the end of the shaft 15. In order to drive the mechanism for conveying printed articles away from the machine, I provide on the end of the shaft 13 a sprocket-wheel 84, around which passes a sprocket-chain 85, which serves to drive a corresponding sprocket-wheel 86 on the end of a long shaft 87, journaled at its opposite ends in the side frames 2 and 2'.

The inking means employed herein should coact with the pattern member or members in such a manner as to lie close to and feed ink through the ink-receiving sides of the stencil-openings, it being evident that when a pattern-belt is used the inking means should coact with and be located at the in-

ner side of each pattern-belt. Here duplex inking devices are employed, one for each pattern-belt, the discharge nozzle or wall of each inking device being located in juxtaposition with the inner face of the working run of a pattern-belt and substantially in contact therewith.

The main inking means preferably embodies a supply-reservoir and a distributing-trough, one of the ink-troughs being supported on the main framework, while the other is supported on the carrier 60. The two ink-troughs are designated by 90 and 90' and are preferably oscillatory about rock-shafts 91 and 91', journaled in bearings on the main framework and on the carrier 60, respectively. Suitable counterpoises or counterweights, such as 92 and 92', are secured to long rock-arms 93 and 93', extending from the rock-shafts 91 and 91', to hold the inner edges of the feed-troughs firmly against the pattern-sheet. These counterweights also serve to close the space between each yielding end wall 96 of an ink-trough and its adjacent main wall, these end walls being secured to spring-arms 97, as shown in Fig. 10, and yielding sufficiently to assure close contact of the forward walls of each ink-trough with the adjacent pattern-sheet. The ink-troughs may be supplied from suitable ink-reservoirs mounted similarly to the ink-troughs just described and designated herein by 100 and 100'. Each of said reservoirs, as here shown, consists of a long horizontal main portion with a filling-opening, such as 101, and a long slot 102 or 102', at the edge of which is a scraper 103 or 103' for removing or scraping surplus ink from an adjacent brush (the purpose of which will be hereinafter stated) and restoring such surplus to the reservoir. An oblique or inclined supply-spout, such as 104 or 104', leads from the main portion of the ink-reservoir, and these supply-spouts terminate just above the ink-troughs 90 and 90', the delivery-opening being controlled by slides, such as 106 and 106', having a series of slots therein adapted to register with corresponding slots in the delivery end of each supply-spout when the slide thereof is moved a short distance. Each reservoir has at its ends a pair of screw-threaded short hangers, such as 110, on which may be screwed corresponding nuts 111 for fastening the ink-reservoirs in place.

I prefer to place guards, such as 115 and 115', around the pattern-belts to engage the pattern-sheets and keep them from springing out at their free ends. These guards are fastened to suitable supports or hangers, such as 116 and 116'.

The inking means just described—viz., the reservoirs and the ink-troughs—constitute the principal means for applying ink through the stencil-openings of the pattern-sheets to the articles stretched over the form-boards. In connection therewith, however, I make use of an auxiliary device or devices for applying a first layer of ink to each article, and

each of these I term a "preliminary" inking device. The preliminary inking devices are located above the main inking means and are preferably a pair of cylindrical brushes, such as 120 and 120', the axles 121 and 121' of which are journaled in suitable bearings (see Fig. 1) and have pinions, such as 122, which are driven positively by spur-gears, such as 123, carried by the shafts 12 and 14. These brushes rotate rapidly and serve to clean off the surplus ink from the inner sides of the working runs of the pattern-sheets and force a sufficient quantity of such surplus ink through the stencil-openings onto the articles descending between the pattern-belts to form a first layer or coat of ink on each article before the main layer of ink is fed through such stencil-openings directly from the ink-trough. Thus each brush coöperates with a main ink-trough in such a manner that two layers or coats of ink are forced through the stencil-openings onto each side of each article printed, and in addition to this each brush cleans all the sheets of its pattern-belt and returns all unused ink to the ink-reservoirs, the scrapers 103 and 103' operating to remove such unused ink therefrom.

By referring to Fig. 5 it will be seen that the various pattern members or sheets secured to the sprocket-chains 5, 5', 6, and 6' overlap in such a manner that the sheets form a practically continuous surface and that the adjacent working runs are located at a uniform distance from each other, except at the points where the cross-bars 4 and 4' close the space between the belts and support the form-boards. Each of these cross-bars preferably has at the end thereof which coacts with the long ends or tops of the form-boards a guide for locating and supporting the form-board properly as it enters between the pattern-belts. These guides are turned oppositely on the cross-bars 4 and 4' in order to form a trough-shaped guide, which is made up in this case of two wing-pieces, (designated, respectively, by 125 and 125'.) The working runs of the pattern-belts, if desired, may be caused to travel between or in contact with a guide or guides near the printing-point in order to obtain a better contact between the pattern-belts and the articles to be printed.

As each form-board passes beyond the ink-troughs the supporting cross-bars 4 and 4' of course diverge from each other and permit the form-board with the printed article stretched thereon to drop as soon as such board is released by the coacting pattern-sheets. In its descent the board should be guided to prevent toppling of the same, and I have shown at 130 on a cross-rod 131 a light spring for this purpose. In this construction as soon as a form-board containing a printed article is released it drops into a transferring device, which in this case is a vertically-reciprocatory frame the working or downward stroke of which is controlled by the cross-bars 4 and 4' of the pattern-belts, although any element

moving in unison with a pattern member may be employed for this purpose. Here the transferring device consists, substantially, of two separated but like parts coacting, respectively, with opposite ends of the cross-bars 4 and 4'. On the inner side of the frame-pieces 2 and 2' are a pair of box-shaped brackets 135, one portion of each of which is a guide 136, in which works a corresponding slide 137. The upper ends of the slides 137 are preferably beveled or cam-shaped slightly in opposite directions to permit the cross-bars 4 and 4' to leave the same easily near the lower ends of the working runs of the pattern-belts. (See Fig. 5.) The straight portion of the upper end of each slide 137 is in position to be engaged and carried down by the cross-bars 4 and 4' of a pair of coacting pattern-sheets at about the time that a form-board containing a printed article is released by said sheets. These slides also serve to receive and support the form-board as soon as the latter drops, and said receiving means consists in this case of a pair of trough-shaped guides 140, secured to the slides 137 and having shiftable bottom walls 141. (See Figs. 5 and 9.) Each of these bottom walls forms part of a pivoted pawl 142, which is normally held by a spring 143, with the bottom wall 141 closing the space at the bottom of the guides 143, the upper sides of the pawls 142 being rounded to constitute them by-pass pawls. At a suitable point in the descent thereof each of the pawls 142 may be released by a tripping device, such as the fixed pawl 145, whereupon the bottom walls 141 will be swung aside, as shown in Fig. 9, and the form-board will be released from the transferring device. Thereupon the cross-bars 4 and 4' will leave the upper ends of the slides 137, and said slides may be returned to their normal positions in any suitable manner—as, for example, by weights 146, attached to chains 147, passing over pulleys 148, supported in the box-brackets 135. The lower end of each slide 137 has a hook 137', which engages the end of the chain 147 opposite the weight 146, and hence the weight is raised on the descent of the slide and will raise the slide again when the chain is released by the cross-bars of the pattern-belts.

From the transferring device each printed article, with its form-board, drops onto a conveyer and is moved away from the mechanism hereinbefore particularly described. This conveyer may be of any suitable construction, but in this case consists of a pair of narrow leather belts 150, passing around band-wheels 151 and 152, secured to a pair of shafts 153 and 154, the former of which is the driving-shaft of the conveyer and is journaled in vertically-adjustable bearings 155 at the bottom of the main frame, while the shaft 154 may be suitably supported at a considerable distance in the rear of the main frame. Each of the belts 150 has a circuit of article-spacing fingers projecting therefrom, and these fingers may be formed by properly bending

narrow strips of sheet metal to form the guides 160. The conveyer is driven in this case from the shaft 87, and hence its movements are timed with those of the pattern-belts. The driving connections between the shafts 87 and 153 are a sprocket-wheel on the shaft 87, from which a sprocket-chain 162 passes to another sprocket-wheel 163 on a stud 164 on the framework, and a smaller sprocket-wheel in fixed relation with the sprocket-wheel 163, transmitting movement in turn to another sprocket-chain 166, which passes around a large sprocket-wheel 167 on the shaft 153.

15 A handle 170, operating the usual shipping-lever 171 to shift the shipper-fingers 172, is shown for starting and stopping the machine.

It will be understood, of course, that the details of many of the operating parts—such, for example, as the pattern-supporting disks on the shafts 13 15, &c.—may be varied at will and that many other features may be varied also without departing from the invention.

25 What I claim is—

1. In a machine of the character described, the combination of an endless pattern-belt comprising a plurality of independently-supported overlapping pattern members or sheets having stencil-openings therein, and inking means coacting with the stencil-openings of the said pattern members or sheets.

2. In a machine of the class specified, the combination of a pattern-belt comprising a plurality of independently-supported hinged pattern members or sheets having stencil-openings therein, and inking means coacting with the stencil-openings of said pattern members or sheets.

3. In a machine of the class specified, the combination of a pair of pattern-belts, each comprising a plurality of independently-supported overlapping pattern members or sheets having stencil-openings therein, the working runs of said pattern-belts being in substantially parallel lines, means coöperative with the pattern members at their working runs and causing them to engage with an interposed article to be printed, and inking means coacting with the stencil-openings of said pattern belts.

4. In a machine of the class specified, the combination of a pair of like pattern-belts, each comprising a plurality of independently-supported hinged pattern members or sheets having stencil-openings therein, and inking means coacting with the stencil-openings of the pattern-belts.

5. In a machine of the class specified, the combination of a pair of pattern-belts, each comprising a plurality of independently-supported pattern members or sheets arranged with their adjacent edges overlapping each other and having stencil-openings therein, the working runs of said pattern-belts being in substantially parallel lines, means coöperative with the pattern-belts at their working

runs and causing them to closely engage with an interposed article to be printed, and inking means coacting with the stencil-openings of said pattern-belts.

6. In a machine of the class specified, the combination of a pair of pattern-belts, each comprising a plurality of pattern members or sheets having stencil-openings therein, endless carriers provided with a series of independent supports to which the members or sheets constituting the pattern-belts are attached, and inking means coacting with the stencil-openings of said pattern-belts.

7. In a machine of the class specified, the combination of a pair of endless pattern-belts, each comprising a plurality of independently-supported pattern members or sheets arranged with their adjacent edges overlapping each other and having stencil-openings therein, the working runs of said pattern-belts being in substantially parallel lines and adjacent to each other, means engaging with the pattern-belts at their working runs and causing them to closely engage an interposed article to be printed, and inking means coacting with the stencil-openings of said pattern-belts.

8. In a machine of the class specified, the combination with a pattern member having stencil-openings therein, of inking means coacting with said stencil-openings and located at the ink-receiving side of the pattern member and having an ink-outlet one of the walls of which is in juxtaposition with the pattern member and is adjustable relatively thereto.

9. In a machine of the class specified, the combination with a pattern member having stencil-openings therein and also having its working run in a substantially vertical plane, of gravity-feed inking means coacting with said stencil-openings at the working run of the pattern member and having an ink-outlet disposed obliquely thereto, one of the walls of which outlet is in juxtaposition with said pattern member and adjustable relatively thereto.

10. In a machine of the class specified, the combination with a pair of endless pattern-belts having stencil-openings therein and coöperative with opposite sides of an article to be printed, the working runs of said pattern-belts being in parallel lines, of pattern-carriers one of which is shiftable toward and from the other, and inking means coacting with said stencil-openings.

11. In a machine of the class specified, the combination with a pattern member having stencil-openings therein, and with means for moving said pattern member in a circuit, of a preliminary inking device coacting with the back of said pattern member to force surplus ink through said stencil-openings onto an article to be printed, and main inking means for forcing a second layer of ink through said stencil-openings onto such article.

12. In a machine of the class specified, the combination with a pattern member having

stencil-openings therein, of means coacting with the back of said pattern member to force ink through said stencil-openings onto an article to be printed.

5 13. In a machine of the class specified, the combination with an endless pattern-belt having stencil-openings therein and with means for feeding said pattern-belt, of ink-supplying means, and a combined cleaning
10 and inking brush coating with the inner side of said pattern-belt to force ink through said stencil-openings onto the article to be printed.

14. In a machine of the class specified, the combination with an endless pattern-belt
15 having stencil-openings therein and with means for feeding said pattern-belt, of an inking-brush coacting with the inner side of said pattern-belt to force ink through said stencil-openings onto an article to be printed,
20 and main inking means coacting with said stencil-openings at another point to apply another layer of ink to such article.

15. In a machine of the class specified, the combination with an endless pattern-belt
25 having stencil-openings therein and with means for feeding said pattern-belt, of a combined cleaning and inking brush coacting with the inner side of said pattern-belt to force surplus ink through said stencil-openings onto an article to be printed, and main
30 inking means coacting with said stencil-openings at another point to apply another layer of ink to such article.

16. In a machine of the class specified, the combination with a pair of pattern members having stencil-openings therein and coöperative with opposite sides of an article to be printed, of a pair of inking-brushes coacting respectively with the inner sides of said pattern members to force ink through said open-
40 ings onto opposite sides of an article to be printed, and main inking means coacting with said stencil-openings at another point to apply another layer of ink to such article.

45 17. In a machine of the class specified, the combination with a pattern member having stencil-openings therein, of a pattern-carrier shiftable toward and from the printing-point, and means supported by said pattern-carrier
50 and coacting with said stencil-openings for applying two layers of ink to one side of an article to be printed.

18. In a machine of the class specified, the combination with a pattern member having
55 stencil-openings therein, of a pattern-carrier shiftable toward and from the printing-point, an inking-brush supported on said carrier and coacting with said stencil-openings at one side of said pattern member to force ink through
60 said stencil-openings onto an article to be printed, and main inking means also supported on said carrier and coacting with said stencil-openings at another point to apply another layer of ink to such article.

65 19. In a machine of the class specified, the combination with an endless pattern-belt having stencil-openings therein, of a pattern-belt

carrier shiftable toward and from the printing-point, an inking-brush on said carrier and coacting with said stencil-openings at the inner side of said pattern-belt to force ink
70 through said stencil-openings onto an article to be printed, and main inking means also supported on said carrier and coacting with said stencil-openings at another point to ap-
75 ply another layer of ink to such article.

20. In a machine of the class specified, the combination with an endless pattern-belt made up of a plurality of removable pattern members each having stencil-openings there-
80 in, of a pattern-belt carrier shiftable toward and from the printing-point, an inking-brush on said carrier and coacting with said stencil-openings at the inner side of said pattern-belt to force ink through said stencil-open-
85 ings onto an article to be printed, and main inking means also supported on said carrier and coacting with said stencil-openings at another point to apply another layer of ink to such article.

21. In a machine of the class specified, the combination with a pattern member having stencil-openings therein, of a pattern-carrier shiftable toward and from the printing-point, an ink-reservoir supported by said pattern-
95 carrier, and an ink-trough also supported by said pattern-carrier and coacting with said stencil-openings at one side of said pattern member to force ink through said stencil-openings onto an article to be printed.

22. In a machine of the class specified, the combination with a pattern-belt having stencil-openings therein, of means for operating said pattern-belt, means for feeding a plu-
100 rality of articles to be printed, means controlled by the travel of said pattern-belt for releasing said articles successively, and inking means coacting with said stencil-openings.

23. In a machine of the class specified, the combination with a sprocket-chain, of a plu-
110 rality of pattern members carried by said sprocket-chain and having stencil-openings therein, means for feeding a plurality of articles to be printed, means controlled by the
115 travel of said sprocket-chain and coacting with each of said pattern members for releasing said articles successively, and inking means coacting with said stencil-openings.

24. In a machine of the class specified, the combination with a pair of pattern-belts hav-
120 ing stencil-openings therein and coöperative with opposite sides of an article to be printed, of means for operating said pattern-belts in unison, means for feeding a plurality of arti-
125 cles to be printed, means controlled by the travel of said pattern members for releasing said articles successively, means for directing said articles between the pattern-belts, and inking means coacting with said stencil-open-
130 ings.

25. In a machine of the class specified, the combination with a pair of sprocket-chains, of a plurality of pattern members carried by

each of said sprocket-chains and having stencil-openings therein coöperative with opposite sides of articles to be printed, means for feeding a plurality of articles to be printed, means controlled by the travel of one of said sprocket-chains for releasing said articles successively, means for directing said articles between the sprocket-chains, and inking means coacting with said stencil-openings.

26. In a machine of the class specified, the combination with a pair of pattern members having stencil-openings therein and coöperative with opposite sides of an article to be printed, of means for feeding, and presenting between said pattern members, a plurality of articles to be printed, end guides for locating said articles during such feeding movement, and inking means coacting with said stencil-openings.

27. In a machine of the class specified, the combination with a pair of pattern members having stencil-openings therein and coöperative with opposite sides of an article to be printed, of an article-spacing feed-screw for spacing and feeding a plurality of articles to be printed, means for releasing said articles successively, end guides for locating said articles and directing them into position between the pattern members, and inking means coacting with said stencil-openings.

28. In a machine of the class specified, the combination with a pattern member having stencil-openings therein, of means for feeding a plurality of articles to be printed, inking means coacting with said stencil-openings, and an endless article-spacing conveyer having its movements timed with those of the pattern member and operative for conveying the printed articles away from said pattern member.

29. In a machine of the class specified, the combination with a pattern member having stencil-openings therein, of means for feeding a plurality of articles to be printed, inking means coacting with said stencil-openings, an endless conveyer for removing the printed articles, and a transferring device between the pattern member and the conveyer for receiving and transferring the printed articles.

30. In a machine of the class specified, the combination with a pattern member having stencil-openings therein, of means for feeding a plurality of articles to be printed, inking means coacting with said stencil-openings, an endless conveyer located below the pattern member for removing the printed articles, and a transferring device below the pattern member and above the conveyer for receiving and transferring the printed articles.

31. In a machine of the class specified, the combination with a pattern member having stencil-openings therein, of means for feeding a plurality of articles to be printed, inking means coacting with said stencil-openings, and a transferring device controlled by

said pattern member and operative for shifting the printed articles.

32. In a machine of the class specified, the combination with a pattern member having stencil-openings therein, of means for feeding a plurality of articles to be printed, inking means coacting with said stencil-openings, and a reciprocatory transferring device having a working stroke derived from the movement of the pattern member and operative for shifting the printed articles.

33. In a machine of the class specified, the combination with a pair of pattern-belts having stencil-openings therein and coöperative with opposite sides of an article to be printed, of means for feeding into position between said pattern-belts a plurality of articles to be printed, inking means coacting with said stencil-openings, and a transferring device controlled by said pattern-belts conjointly and operative for shifting the printed articles.

34. In a machine of the class specified, the combination with a pair of pattern-belts having stencil-openings therein and coöperative with opposite sides of an article to be printed, of means for feeding into position between said pattern-belts a plurality of articles to be printed, inking means coacting with said stencil-openings, a transferring device having a working stroke controlled by said pattern-belts conjointly and operative for shifting the printed articles, and means for imparting a return stroke to said transferring device.

35. In a machine of the class specified, the combination with a pair of pattern-belts having stencil-openings therein and coöperative with opposite sides of an article to be printed, of means for feeding into position between said pattern-belts a plurality of articles to be printed, inking means coacting with said stencil-openings, a transferring device in position to receive each printed article as it emerges from the pattern-belts and be shifted by the pattern-belts, and means for imparting a return stroke to said transferring device.

36. In a machine of the class specified, the combination with a pair of pattern-belts having stencil-openings therein and coöperative with opposite sides of an article to be printed, of means for feeding into position between said pattern-belts a plurality of articles to be printed, inking means coacting with said stencil-openings, a transferring device in position to receive each printed article as it emerges from the pattern-belts and be shifted by the pattern-belts, and a tripping device for releasing said article.

37. In a machine of the class specified, the combination with a pair of pattern-belts having stencil-openings therein and coöperative with opposite sides of an article to be printed, of means for feeding into position between said pattern-belts a plurality of articles to be printed, inking means coacting with

said stencil-openings, a transferring device in position to receive each printed article as it emerges from the pattern - belts and be shifted by the pattern-belts said device having a shiftable bottom wall, and a tripping device for shifting said bottom wall to release said article.

38. In a machine of the class specified, the combination with a pair of pattern-belts having stencil-openings therein and coöperative with opposite sides of an article to be printed, of means for feeding into position between said pattern-belts a plurality of articles to be printed, inking means coacting with said stencil-openings, a transferring device in position to receive each printed article as it emerges from the pattern-belts and be shifted by the pattern - belts said device having a shiftable bottom wall, a tripping device for shifting said bottom wall to release said article, and an endless article-spacing conveyer for receiving said printed articles from the transferring device and spacing them.

39. In a machine of the class specified, the combination with a pair of pattern-belts embodying complementary pattern members having projecting supports for locating articles to be printed and also having stencil-openings coöperative with opposite sides of such articles, of means for feeding into position between said pattern members articles to be printed, and inking means coacting with said stencil-openings.

40. In a machine of the class specified, the combination with a pair of pattern-belts em-

bodying complementary pattern members having projecting supports for locating articles to be printed and also having stencil-openings coöperative with opposite sides of such articles, of means for feeding into position between said pattern members articles to be printed, inking means coacting with said stencil-openings, and a transferring device operated by one pair of said supports on the release of an article by the preceding pair of supports and operative for shifting the printed articles.

41. In a machine of the class specified, the combination with a pattern member having stencil-openings therein, of a pivoted ink-trough having an outlet-wall in juxtaposition with said pattern member, and a counterpoise for holding said wall up against said pattern member.

42. In a machine of the class specified, the combination with a pattern member having stencil-openings therein, of a pivoted ink-trough having yielding end walls in juxtaposition with said pattern member, and a counterpoise for holding said walls up against said pattern member.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 17th day of June, 1902.

ROBERT BAIRD.

Witnesses:

CHAS. F. DANE,
M. L. FORREST.