

No. 680,III.

Patented Aug. 6, 1901.

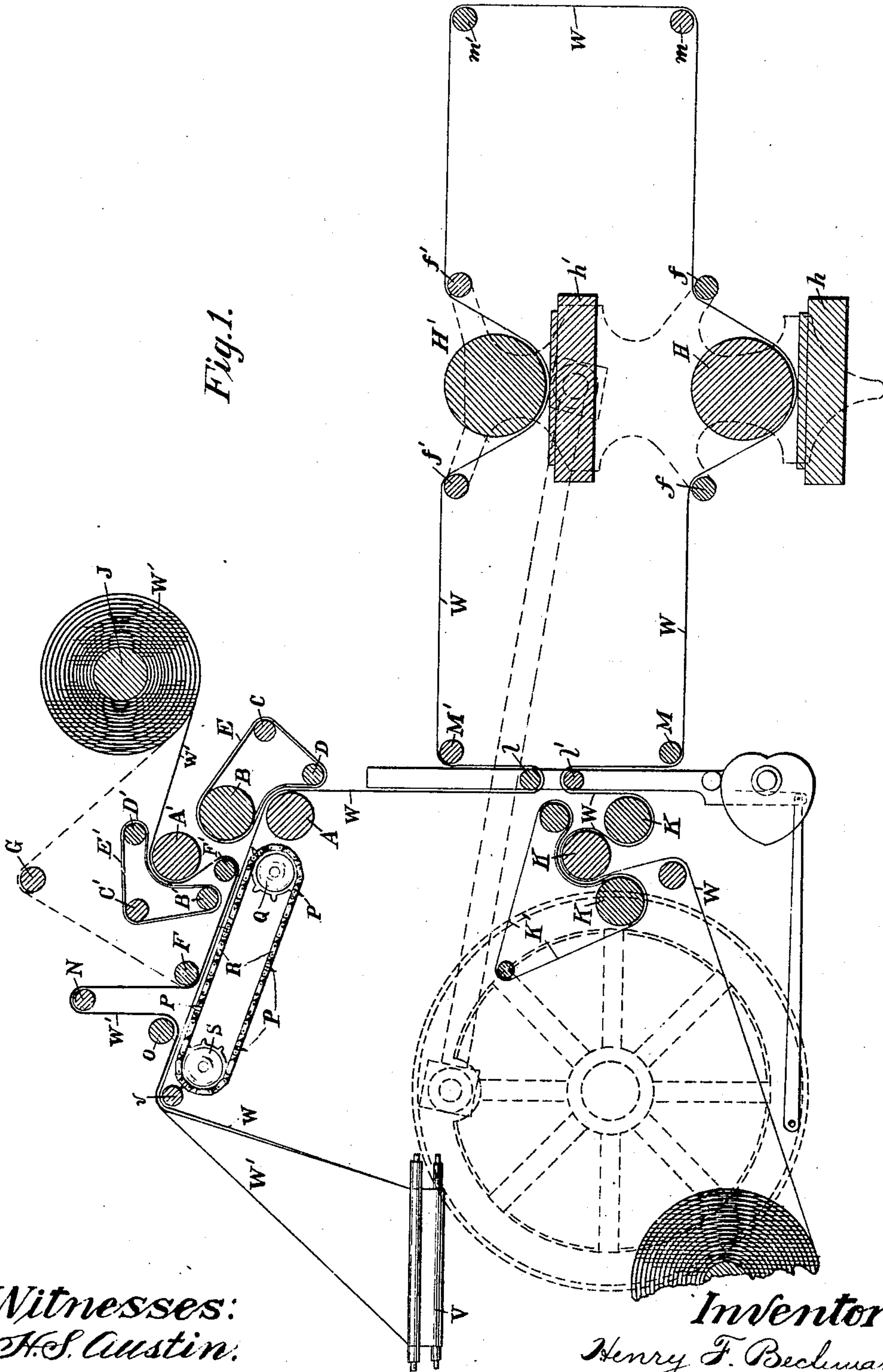
H. F. BECHMAN.  
REWINDING AND INSERTING MECHANISM.

(Application filed Dec. 4, 1899.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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James R. Mansfield.

Inventor:  
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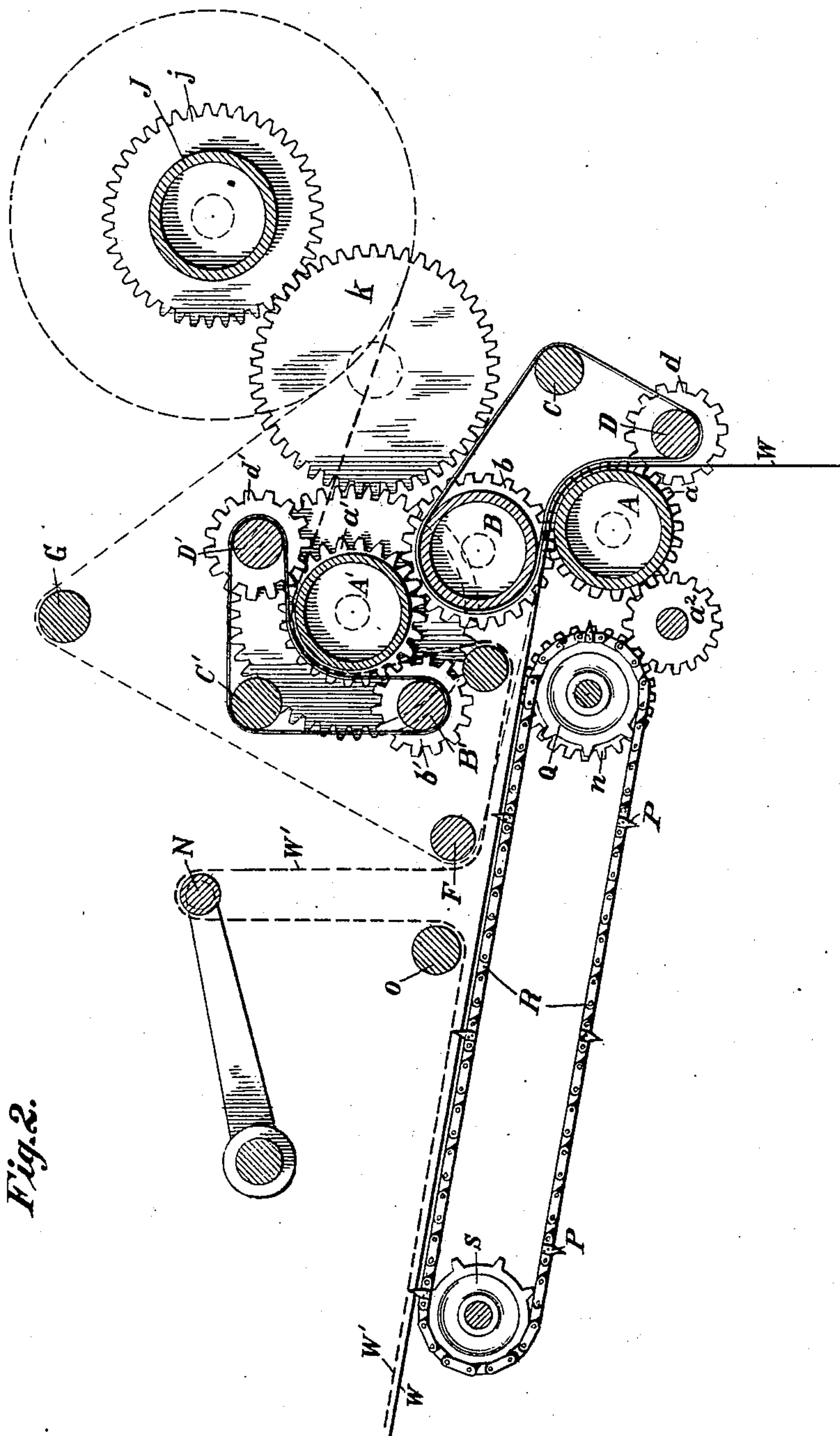


Fig. 2.

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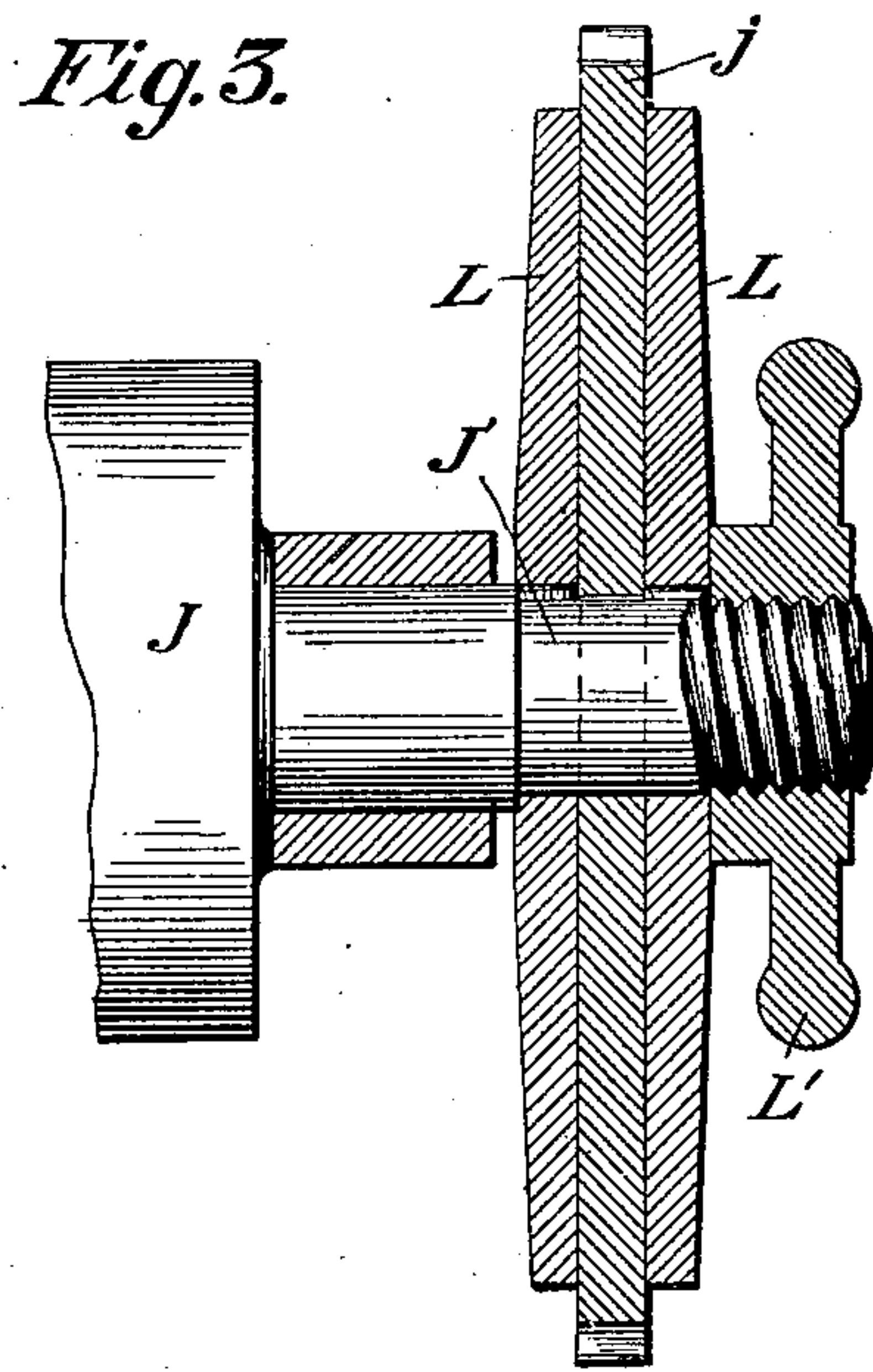
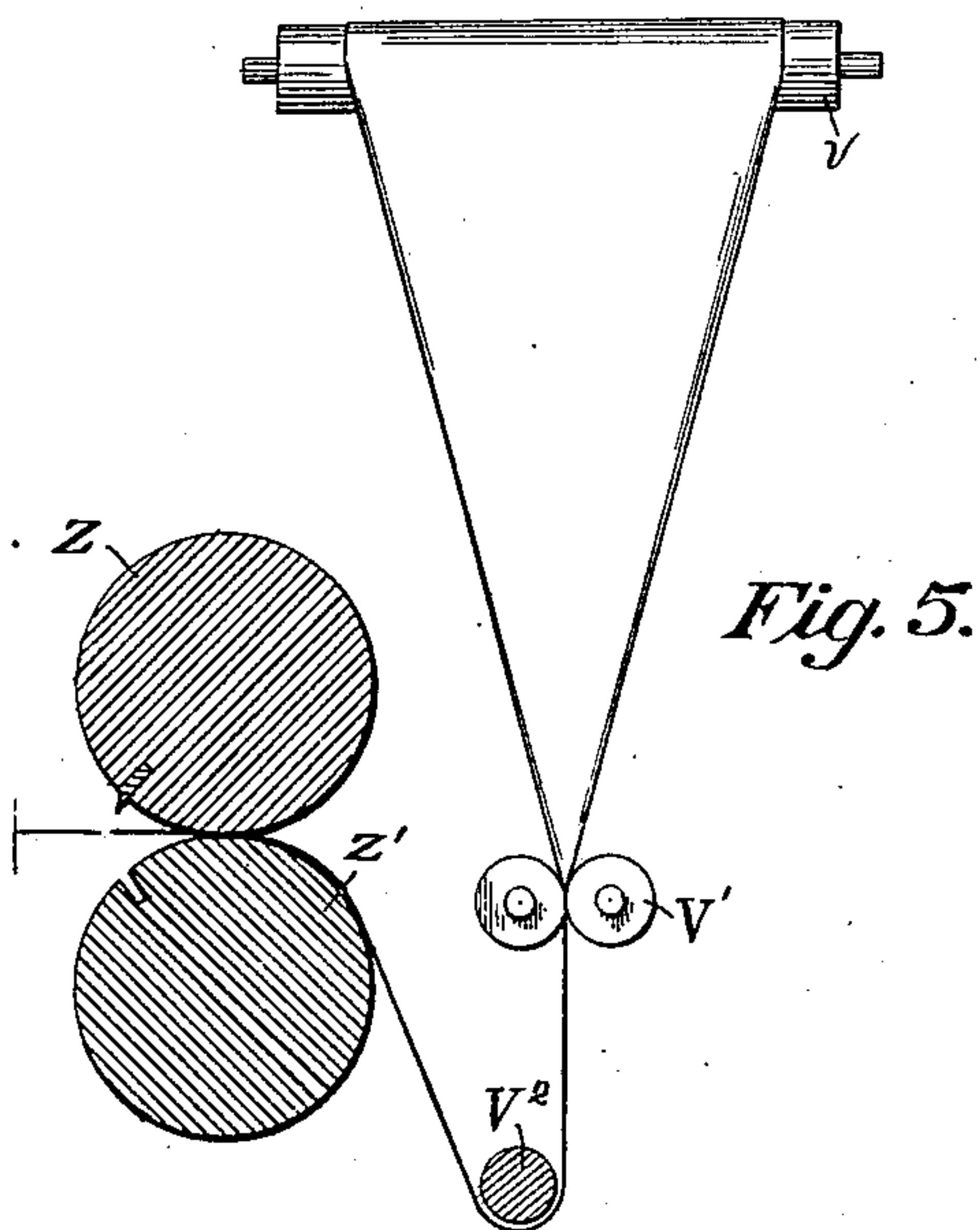
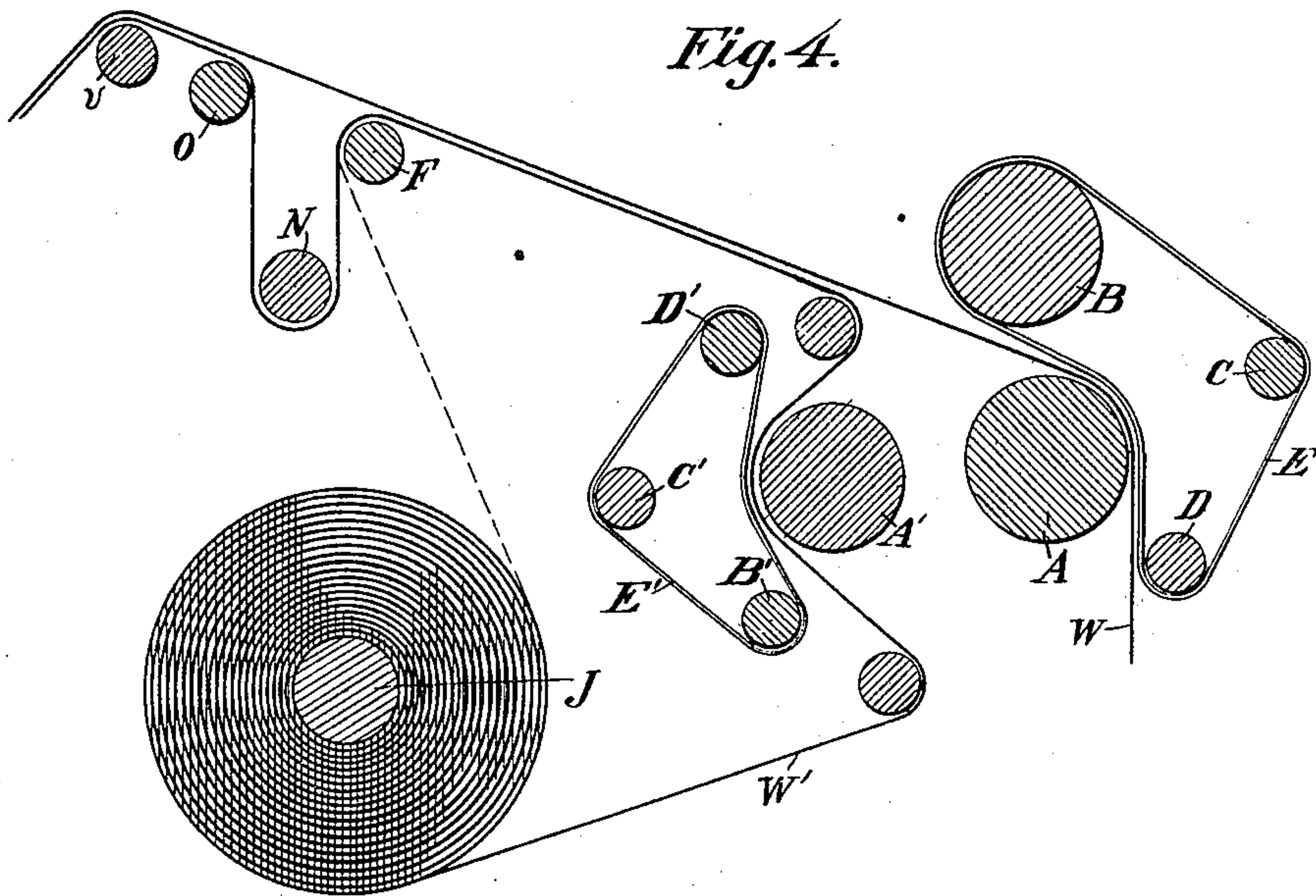
H. F. BECHMAN.

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3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

HENRY F. BECHMAN, OF BATTLECREEK, MICHIGAN, ASSIGNOR TO EDWIN C. NICHOLS, OF SAME PLACE.

## REWINDING AND INSERTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 680,111, dated August 6, 1901.

Application filed December 4, 1899. Serial No. 739,171. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY F. BECHMAN, of Battlecreek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Rewinding and Inserting Mechanism; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in stationary-bed reciprocating-cylinder type-printing web-perfecting presses of the type shown in United States Patent No. 478,503, of July 5, 1892, and commonly known as the "Cox" duplex presses. The larger presses of this type can only print papers of, at most, eight pages; and it is the object of this invention to enable a publisher to print and deliver from an ordinary duplex machine (whose maximum capacity, as stated, is eight pages) ten, twelve, fourteen, or sixteen pages, which may be cut, folded, and delivered as one paper. In brief, by this invention the size of the paper delivered from the press can be actually doubled, although the time required to produce the papers will be proportionately increased.

Many publishers of daily papers find it frequently necessary to print issues of more than eight pages, and heretofore in order to do this with an eight-page duplex machine it has been necessary either to run two or more sections of the paper separately and deliver them to the subscribers in separate sections, which is very objectionable, or else to discard the old machine and purchase one capable of printing and folding at one operation more than eight pages.

In order to produce papers of extra size or from ten to sixteen pages on an ordinary duplex press, I first print, say, eight pages of the paper on an endless web of paper and without severing these papers from the web automatically rewind the same as printed upon a spool by suitable rewinding mechanism connected with the machine and then subsequently print the other sheets or portions of the paper upon another web and lead the previously-printed web from the spool on which it was rewound into the folding mechanism simultaneously and together with the

second web as the latter is being printed and pass the said webs together to and through the cutting, folding, and delivering mechanisms of the machine, whereby all the pages of the paper will be assembled and folded together and a complete paper, consisting of ten, twelve, or sixteen pages, as the case may be, will be delivered from the press as a whole and not in detached or separate parts or sections.

The operation of printing and rewinding the first section of the paper, while involving some extra time and labor, will really not be a serious matter, as most of the papers printed on such presses do not have a circulation exceeding four thousand to six thousand, and the section of the paper to be rewound can thus be run through the press and printed in about an hour at very little expense, while the saving in the original cost of a machine capable of printing sixteen pages and the room occupied by it and in the expense of operating it will more than offset the loss of time.

The invention consists in the novel constructions and combinations of parts hereinafter claimed, and described with reference to the accompanying drawings, in which—

Figure 1 is a diagrammatic sectional elevation of a Cox duplex press with my improved rewinding and inserting mechanism applied thereto. Fig. 2 is an enlarged view of the rewinding and inserting mechanism detached. Fig. 3 is a detail section of the mechanism for driving the rewinding-spool shaft. Fig. 4 is a detail view illustrating the rewinding and inserting mechanisms in a different location in the press. Fig. 5 is a detail view of the folder.

Referring to said drawings, K K' designate the infeed rolls and tapes; *l l'*, the movable web-looping rollers; M M' m m', the stationary web-guiding rollers on the frame of the press; *h h'*, the lower and upper type-beds; H H', the lower and upper cylinder cooperating with the type-beds; *f* and *f'*, the movable web-guide rollers beside the cylinders, and W designates the web of paper. These parts are constructed and operated substantially as described in the patent to Cox, No. 478,503, aforesaid, and need not be more particularly described herein, the same being



well understood. After passing the upper looping-roller *l* the web is led through a continuously-operating delivery mechanism, which is similar to the infeed mechanism, but driven slightly faster than the latter, and, as shown, is composed of the rolls A B and coacting tapes E, which tapes pass over rolls B, C, and D and coact with the roll A and feed the printed web continuously from the press, as usual in the duplex presses. From the delivery-roll A the web ordinarily is led directly to the folder V, being guided thereto over a roller *v*, as shown.

At a suitable point, preferably intermediate the delivery-roller A and the folder, is located a rewinding and inserting mechanism, which may be arranged either above the folding and delivery mechanisms, as shown in Fig. 1, or below and intermediate the delivery and folding mechanisms, as indicated in Fig. 4.

Referring to Fig. 1, F and G are rolls around which the web of paper is carried from the roll A to the spool J when rewinding same. W' is the web of paper rewound upon the spool J. A', B', C', and D' are rolls and E' tapes for again feeding the web W' of paper from the rewound roll to a guide-roller F', at which point it is brought into register with the new web W of paper being printed in the press and delivered through the delivery-rolls A and B.  $a a' b b' d d'$  are gears upon the rolls A A' B B' D D' and serve to keep the various rolls moving at the proper peripheral velocity. The gear *j* is loosely mounted on gudgeon J' of rewinding-spool J. L and L' are friction-disks secured to the gudgeon J' by keys and are made to press against the faces of gear *j* by means of the nut L', threaded on the gudgeon J'. The gear *j* is driven by gears *k* and *k'*, the latter being secured to the roll A'. The gear *j* has a tendency to turn the spool J at a greater rate than the web is delivered to it; but as the spool J during rewinding is caused to turn by the friction between the gear *j* and disks L L' rupture of the web is prevented by properly adjusting nut L'.

In a Cox duplex press the delivery-rolls A and B are slightly larger in diameter than the rolls feeding the paper into the press. This feature may be retained in the present instance; but the roll A' is preferably made of the same diameter as the feed-rolls in order that as nearly as possible equal lengths of paper may be fed into the press by the feed-rolls K and from the rewound roll by roll A' and tapes E'. Of course previous to unwinding the printed web from the spool J the friction-disks L L' are loosened, so as to permit the roll A' and tapes E' to draw the web therefrom.

The webs W and W' pass on from the roll F' to the folder; but for the purpose of obtaining easy register of the margins on the webs web W' is looped over an adjustable roller N, between stationary rollers F and O, as shown.

The roll N is for the purpose of adjusting the web W' so that the margins of the sheets will coincide with the margins of the web W. Sprocket Q is driven by gears *n* and  $a^2$  from gear *a*. The pointers P are secured to the chain R at equidistant points, the distance between any two points being the length of one sheet of paper. The chain R is also caused to move at an exact speed with the web W.

The margins on web W are indicated by pointers P P on a sprocket-chain R, which is supported on sprockets Q and S. This enables the operator to locate the margins on web W by pointers P, and by adjusting the roll N, thereby lengthening or shortening the loop of web W' between the rollers F and O, and cause the margins on web W' to coincide with the pointers P, and consequently with the margins on web W. After the two webs are associated they pass to the folder V, composed of the ordinary angle-plate of the cow-catcher type, having a pair of folding-rolls V' at its apex, so that the associated webs are given a first fold before they are severed into sheets. They are then passed through the cutting-cylinders Z Z', by which the webs are severed. The webs may pass under a guide-roller V<sup>2</sup>, between the rolls V' and the cutting-cylinders, if desired; but it is desirable not to sever the webs until they are associated and given this first fold.

Operation: If it is desired to produce an extra-large paper—say a sixteen-page paper—on a duplex press, which as ordinarily constructed is only capable of printing eight pages, the operation is as follows: The forms for eight pages (the full capacity of the press) are placed in the press, these forms being selected from those pages which do not contain the latest matter for publication. The press is then operated to print the web, as usual, with the exception that instead of the web being led on from the delivery-roll A to the folder it is switched off around the rolls F and G and rewound upon the spool J until the desired number of impressions have been made upon the web and rewound upon the spool J. The forms are then removed from the press and replaced by the remaining type-forms for the other pages of the paper, and the web is then broken and led from the delivery-roll A directly to the folder V, as indicated by the web W, and at the same time the end of the previously printed and rewound web W' is led from the spool J (the friction-disks L L' being previously loosened) to and between the feeding-roll A' and tapes B', under the rolls F and F', looped over the roller N, and passed thence under the roller O, at which point it is finally associated with the web W and passes therewith over roller *v* to the folder V, where they are given the first fold and thereafter are cut into sheets, so that from the roller O onward the webs W W' pass and are handled as one. Consequently a sixteen-page paper can be folded, cut, and delivered.



ered as one instead of being delivered in sections. While this operation of course requires running double the length of time which would be required if the press were capable of printing the sixteen pages simultaneously, yet the time necessary for this operation is not great and the first eight pages can be printed while the forms for the other pages are being made up. The users of these presses generally would have no serious objection to printing a part of the paper an hour or two before the rest is printed, and the large saving in the cost of the press would more than compensate for the extra time required, and a press of this kind would be generally preferred on account of its smaller size, greater simplicity, and less cost. This is particularly true in offices where extra-sized papers are only needed occasionally.

In Fig. 4 I have indicated an arrangement of the rewinding and inserting mechanism below and intermediate the delivery and folding mechanisms. The construction and operation of the parts being, however, substantially similar to that already described, it is unnecessary to enlarge thereupon.

Having thus described my invention, what I therefore claim as new is—

1. In a web-printing press, the combination of the feeding, printing, delivering, folding and cutting mechanisms; with mechanism for rewinding the web, located between the delivering and folding mechanisms whereby a web of paper after it is printed may be rewound, and mechanism for subsequently unwinding the rewound web, without change of position thereof, and associating the same with a second web, as the latter issues from the press, at a point between the delivery and the folder, the two webs being then passed through, and handled as one web in, the folding and cutting mechanisms, substantially as described.

2. In a printing-press, the combination with the feeding, printing, delivering, folding and cutting mechanisms for a web, of a secondary web-feeding mechanism located beside the delivery, a web-spool beside the secondary feeding mechanism, frictional gearing for driving said web-spool, and guide-rollers whereby a web of paper may be diverted from the folder to said spool and rewound thereon as it is being printed, said web being subsequently broken when a sufficient amount is accumulated on the spool, and led back to the secondary feed and associated with the freshly-printed web coming from the press and carried therewith through the folding and cutting mechanisms, substantially as described.

3. In a web-printing press, the combination of the web feeding, printing, delivering, folding and cutting mechanisms; a secondary feeding mechanism located beside the delivery and gearing for operating the secondary feed from the delivery mechanism, a web-spool beside the secondary feed, and frictional

gearing for driving said web-spool from said secondary feed, with guide-rollers whereby a web of paper may be diverted from the folder to said spool and rewound thereon as it is being printed, said web being subsequently broken when a sufficient amount is accumulated on the spool, the frictional gearing then loosened, and mechanism whereby the rewound web is led back through the secondary feed and associated with a second web coming from the press and carried therewith through the folding and cutting mechanisms, substantially as described.

4. In a web-printing press, the combination of web feeding, delivering, printing, folding and cutting mechanisms; with a combined rewinding and web-feeding mechanism located intermediate the delivery and folding mechanisms, said mechanism being constructed first to divert a web from the folder and to rewind the same as it is being printed and thereafter, without changing the position of the rewound web, to unwind the same and feed it forward to the folder at the same speed as, and together with, a second web being then printed on the machine and fed directly to the folder by the press-delivery mechanism, said two webs being associated as one web, given the first fold and subsequently severed, for the purpose and substantially as described.

5. In a web-printing press, the combination of the web feeding, delivering, printing, folding and cutting mechanisms and a combined rewinding and web-feeding mechanism intermediate the delivery and folding mechanisms, adapted first to divert a web from the folder and to rewind the same as it is being printed and thereafter, without changing the position of the rewound web, to unwind the same and feed it forward to the folder at the same speed as, and together with, a second web then being printed on the machine, said two webs being associated and subsequently handled as one web; with margin-indicating mechanism for the web passing directly from the press to the folder, and mechanism for looping the rewound web before it is associated with the second web to insure register of the margins of the two webs, substantially as described.

6. The combination of a pair of stationary beds, a pair of reciprocating impression-cylinders coacting with such beds and the web feeding, printing, delivering and folding mechanisms of a press, a secondary feed mechanism, a web-rewinding spool and gearing to drive the same; with web-guiding rolls the construction being such that a web may be diverted from the folder and directed to said spool to be rewound thereon as printed, said web to be subsequently broken and fed by the secondary feed toward the folder and associated with a second web issuing from the press and fed directly therefrom to the folder, the two webs being associated and passing through the folding mechanism as one web, substantially as described.



7. The combination of a pair of stationary beds, a pair of reciprocating impression-cylinders coacting with such beds and the web feeding, printing, delivering, folding and cutting mechanisms of a press, a secondary feed mechanism located beside the delivery mechanism and driven by gearing therefrom, and a web-rewinding spool and gearing to drive the same from the secondary feed mechanism; with web-guiding rolls whereby a web may be diverted from the folder and rewound upon said spool as printed, said web to be subsequently broken and fed by the secondary feed toward the folder and associated with a second web issuing from the press and fed directly therefrom to the folder, the two webs being associated and passing through the folding and cutting mechanisms as one web, substantially as described.

8. The combination of a pair of stationary beds, a pair of reciprocating impression-cylinders coacting with such beds and the web feeding, printing, delivering and folding mechanisms of a press, a secondary feed mechanism, and a web-rewinding spool, and web-guiding rolls whereby a web may be diverted from the folder and rewound upon said spool, said web to be subsequently broken and fed by the secondary feed toward the folder, and associated with a secondary web issuing from the press and fed directly therefrom to the folder; with mechanism for indicating the margins of the second web, and mechanism for looping the rewound web, whereby the margins between the impressions on the rewound web may be caused to register with the margins on the secondary web at the point of association thereof, for the purpose and substantially as described.

9. The combination of a pair of stationary beds, a pair of reciprocating impression-cylinders coacting with such beds and the web feeding, printing, delivering, folding and cutting mechanisms of a press, a secondary feed mechanism located beside the delivery mechanism and driven by gearing therefrom, a web-rewinding spool and frictional gearing to drive the same from the secondary feed mechanism, and web-guiding rolls whereby the web may be diverted from the folder and rewound upon said spool, said web to be subsequently broken and fed by the secondary feed toward the folder, and associated with a second web issuing from the press and fed directly therefrom to the folder; with mech-

anism, comprising an endless sprocket-chain and a series of pointers thereon, for indicating the margins of the secondary web, and web guiding and looping rollers for looping the rewound web, whereby the margins between the impressions on the rewound web may be caused to register with the margins on the secondary web at the point of association thereof; said webs being associated and given a first fold together and subsequently severed into sheets, for the purpose and substantially as described.

10. In a printing-press, the combination of web feeding, printing, delivering, folding and cutting mechanisms; with web-rewinding mechanism whereby a web of paper run through the press and printed may, before folding or cutting, be rewound, between the delivery and the folding mechanisms, and mechanism whereby the rewound web may without change of position be unwound and associated with freshly-printed web issuing from the press before it reaches the folder, the two webs being then passed together onto the folding mechanism and partly folded prior to the cutting thereof into sheets, substantially as and for the purpose described.

11. In a printing-press, the combination of web printing, delivering, folding and cutting mechanisms, and a rewinding mechanism comprising a frictionally-driven spool and gearing for operating the same from the delivery mechanism, whereby a web of paper may be printed in the machine and immediately rewound as a web; with a second feeding mechanism located beside the delivery mechanism, and gearing for driving said secondary feed mechanism from the delivery mechanism, said secondary feed mechanism being adapted to withdraw the rewound web from said spool without changing the position of the latter and feed the web to the folding mechanism simultaneously with a second web fed from the press directly to the folding mechanism, the two webs being associated prior to reaching the folder and being handled as one web in the folding and cutting mechanisms, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HENRY F. BECHMAN.

In presence of—

CHAS. GRAMES,

CHARLES H. WHEELLOCK.