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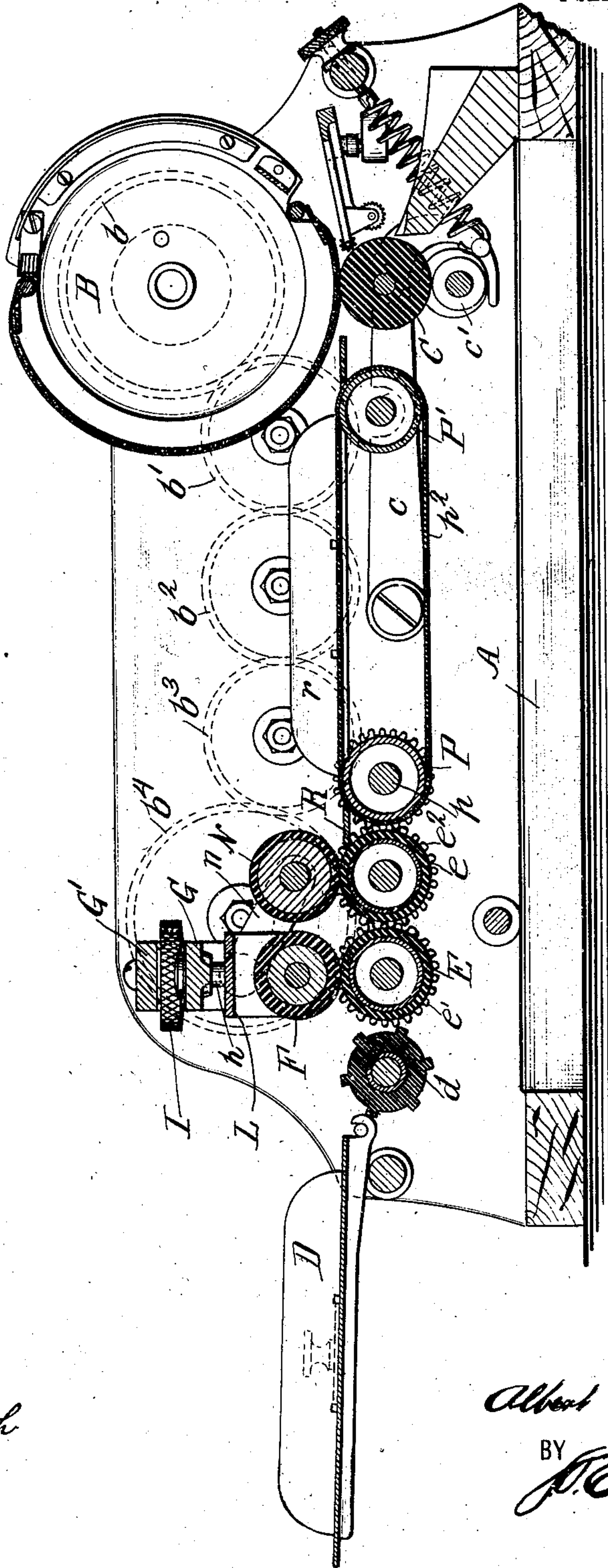
A. B. DICK.

PAPER FEEDING AND STENCIL DUPLICATING APPARATUS.

APPLICATION FILED FEB. 4, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

L. Nork  
J. McInlooh

INVENTOR

Albert B. Dick

BY

J. Edwards

ATTORNEY

No. 828,465.

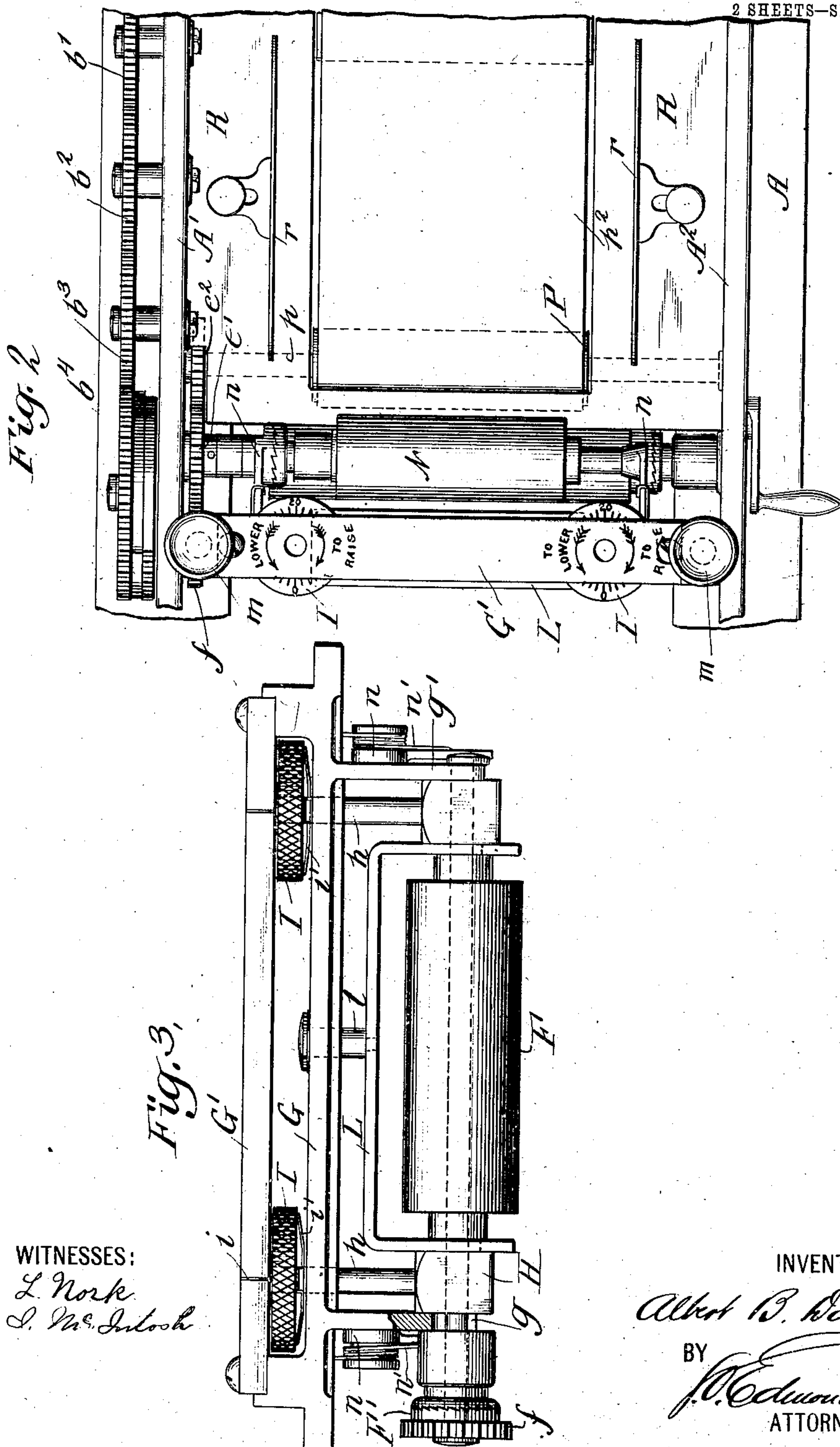
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2 SHEETS—SHEET 2.





# UNITED STATES PATENT OFFICE.

ALBERT B. DICK, OF LAKE FOREST, ILLINOIS, ASSIGNOR TO A. B. DICK COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## PAPER-FEEDING AND STENCIL-DUPLICATING APPARATUS.

No. 828,465.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed February 4, 1905. Serial No. 244,140.

*To all whom it may concern:*

Be it known that I, ALBERT B. DICK, a citizen of the United States, residing at Lake Forest, in the county of Lake and State of Illinois, have invented a certain new and useful Improvement in Paper-Feeding and Stencil-Duplicating Apparatus, of which the following is a description.

The present invention relates generally to subject-matter similar to that disclosed in Letters Patent No. 749,984, granted to me January 19, 1904. Its object is to perfect apparatus of the character there referred to, chiefly with regard to the mechanism for separating and feeding successive sheets of impression-paper from the under side of a pile and forwarding the same to the stencil-printing or other apparatus, by means whereof such sheets are to be printed or otherwise treated.

More specifically, the present invention relates, therefore, to improvements in the mechanism whereby successive sheets are fed from the under side of the pile, the passage of more than one sheet at a time is effectively prevented, and the sheet being fed is passed continuously and uniformly to the printing or other device.

The invention further includes provision for adjustment of certain members of the feeding mechanism to allow for variation in the thickness or character of the sheets.

In carrying out the invention I employ generally a separator-roll underlying the forward end of the sheet pile and one or more feed-rolls adapted to receive a sheet from such pile and pass the same rearwardly toward the printing or other device. By suitable mechanism of any desired form I preferably give to the separator-roll and to one or more of the feed-rolls an intermittent movement, and over one of the feed-rolls I arrange a paper-stopping device, preferably (although not necessarily) in the form of a roll or rolls operating (either continuously or intermittently) in the direction opposite that of the movement of the feed-roll and between the periphery whereof and that of such feed-roll the sheets are adapted to pass.

One part of the present invention concerns the means whereby such a paper-stopping device may be readily regulated with respect to its relation to the feed-roll in order to

adapt the mechanism for feeding sheets of varying thickness.

Another feature of the invention concerns means for passing a sheet from the separating and feeding mechanism to a stencil-printing or other device, and this in the present instance takes the form of an endless belt suitably driven and adapted to receive the sheet from the feeding mechanism proper and to pass the same continuously rearward to the point of coaction with the stencil-printing or other device.

Other features of the invention will be referred to in connection with the description of the two here mentioned.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal central section of a combined paper-feeding and stencil-printing apparatus employing my invention. Fig. 2 is a plan view illustrating the major portion of the mechanism shown in Fig. 1; and Fig. 3 is an end elevation, on enlarged scale, of the paper-stopping device illustrated in Figs. 1 and 2 and its adjusting mechanism.

Referring to the drawings, in which similar letters denote corresponding parts, the mechanism is here shown as comprising generally the base A, carrying a supporting-frame consisting of side plates A' A<sup>2</sup>. In these are mounted in the present embodiment of the invention the rotary stencil-duplicating drum B, having a stencil upon the periphery thereof, and underlying such drum a pressure-roll C, mounted in hinged arms c, having coacting cams c', whereby the pressure-roll C is thrown to operative or inoperative position. The drum B is rotated in any suitable manner and is provided with a pinion b, which through intermediate pinions b' b<sup>2</sup> b<sup>3</sup> transmits movement to a pinion b<sup>4</sup>, forming part of the sheet-feeding apparatus now to be described.

D designates a feed-board adapted to receive a sheet pile, the forward end whereof rests upon a separator-roll d, driven (directly or indirectly) by the pinion b<sup>4</sup>.

E designates a feed-roll, and e a sheet-passing roll, the feed-roll E being driven (directly or indirectly) from the pinion b<sup>4</sup> and carrying loosely mounted thereon a pinion e'. The passing-roll e is also driven from the pinion b<sup>4</sup> and has a pinion e<sup>2</sup>, meshing with the loosely-



mounted pinion  $e'$  to transmit movement to the paper-stopping apparatus presently to be explained. Preferably the connections between the rolls referred to and the power-transmitting device (represented by the pinion  $b^4$ ) will be generally similar to those described in my former patent, with the result that the movement of the separator-roll  $d$  and of the feed-roll  $E$  will be intermittent, while that of the passing-roll  $e$  will be continuous.

$F$  designates the paper-stopping device (here shown in the form of a single roll, although this may be in the form of two separated rolls, as shown in my former patent, if desired) having, preferably, a rubber-covered periphery. The shaft of said reverse-roll is preferably mounted in bearing-blocks  $H$  (presently to be described) and passes through elongated vertical slots  $g$ , formed in hangers  $g'$ , depending from the reverse-roll support  $G$ . Said shaft is also provided at one end with a pinion  $f$ , meshing with the pinion  $e'$ , loosely mounted upon the shaft of the feed-roll  $E$ , and therefore receiving in the preferred form of the invention continuous movement, but in a direction the reverse of the direction of movement of said feed-roll.

If desired, there may be a clutch device  $F'$  between the shaft of the reverse-roll  $F$  and the pinion  $f$ , and such device may be the same in construction as the similar devices set forth in my former patent.

Secured to or formed integral with the bearing-blocks  $H$  are rods  $h$ , the upper ends whereof pass through openings in the support  $G$  and into or through similar openings in a cross-bar  $G'$ , secured by any suitable means, such as screws, upon said support. The upper ends of said rods  $h$  are screw-threaded for coaction with adjusting-nuts  $I$ , here shown as of circular form and arranged between the support  $G$  and the cross-bar  $G'$ . The upper surfaces of said adjusting-nuts  $I$  are graduated, (see Fig. 2,) and with these graduations may coact a mark or other indication  $i$ , formed upon the edge of the cross-bar  $G'$ . The upper surface of the cross-bar is also preferably provided with arrows indicating the proper direction in which to turn the nuts  $I$  in order to raise or lower the bearing-blocks  $H$ , and consequently the shaft of the reverse-roll  $F$ . It will thus be seen that by the means described the relation of the reverse-roll  $F$  to the feed-roll  $E$  may be very nicely adjusted and also that the former may be raised or lowered evenly, so that its periphery shall at all times lie absolutely parallel with that of said feed-roll. In order to prevent the nuts  $I$  from jarring loose, and thereby throwing the reverse-roll out of adjustment, I preferably arrange below each of said nuts and bearing upon the upper surface of the support  $G$  a spring-washer or other suitable device  $i'$ .

$L$  designates a sheet-guard, here shown as

comprising a U-shaped strap, preferably of metal and provided with elongated vertical slots through which the shaft of the reverse-roll  $F$  extends. Said guard may be supported in either or both of the following ways—to wit, by coaction of the upper portions of the slots with the reverse-roll shaft or by the headed pin  $l$ ; secured thereto and extending through an orifice in the reverse-roll support  $G$  and the head whereof is arranged upon the upper side of said support, such pin being freely movable in such orifice. The extremities of said guard extend very close to, but do not quite touch, the periphery of the feed-roll  $E$ . As in the corresponding part shown in my former patent, the forward lower corners of the paper-guard are curved or beveled in order to give a similar curve or bevel to the advancing forward edge of the sheet pile.

The reverse-roll support  $G$  and mechanism attached thereto may be secured in position in any suitable manner, and, if desired, provision may be made for moving the same forward or rearward in order to obtain an adjustment of the reverse-roll relatively to the feed-roll, such as that suggested in my former patent. In the present instance I have shown said reverse-roll support as secured by means of screws  $m$  to ears formed on and projecting inwardly from the side members  $A A'$  of the frame.

In practice I prefer to employ above and coacting with the passing-roll  $e$  a gravity-roll  $N$ . This may be conveniently supported in arms  $n$ , pivoted upon the hangers  $g'$  and spring-pressed by means of springs  $n'$  to assure close contact between said gravity-roll  $N$  and said passing-roll  $e$ .

Rearward of the feed-roll  $E$  (in the present case rearward also of the passing-roll  $e$ ) is a belt-roll  $P$ , mounted upon a shaft  $p$ , provided with a pinion meshing with the pinion  $e^2$  on the shaft of the passing-roll  $e$ , to receive (preferably continuous) movement therefrom. If desired, however, said shaft may extend through the side plate  $A'$  of the frame and be there provided with a pinion receiving movement from one of the pinions  $b^2 b^3 b^4$  or another pinion driven by one of these.

$P'$  designates a roll similar to the roll  $P$  and mounted upon a shaft journaled in the side members  $A A'$  of the frame. Said rolls  $P$  and  $P'$  carry an endless belt or apron  $p^2$ , the upper surface whereof lies in substantially the same plane as the point of coaction between the reverse-roll  $F$  and feed-roll  $E$  and the point of coaction of the gravity-roll  $N$  and passing-roll  $e$ . Upon shelves  $R$ , projecting inwardly from the side members  $A A'$  of the frame or otherwise suitably supported, are adjustable guides  $r$ , the object whereof is to prevent disarrangement of the sheets in their passage from the sheet-feeding apparatus to the stencil-printing or other device.

The operation of the mechanism has been



indicated to some extent in connection with the foregoing description. The sheet pile is laid upon the feed-board with its forward edge resting upon the separator-roll *d*. The mechanism being then put in operation—as, for instance, by the rotation of the drum B—said separator-roll *d* and the feed-roll E are given intermittent movement in a rearward direction, while the reverse-roll F is given continuous movement in the opposite direction. The sheets are fed successively from the under side of the pile between the reverse-roll and the feed-roll, the former having been so adjusted relatively to the latter as to oppose the passage of any save the lowermost sheet of the pile, and such lowermost sheet is fed continuously between said reverse-roll and feed-roll and between the passing-roll *e* and gravity-roll N upon the endless belt or apron *p*<sup>2</sup>, whereby its rearward movement is continued until said sheet reaches a point where it is grasped or otherwise acted upon by the stencil-printing or other device.

Having now described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. In paper-feeding apparatus, the combination with a feed-roll, of an overlying reverse-roll, a detachable support, a loosely-mounted paper-guard carried thereby, and adjusting mechanism between said reverse-roll and said support, substantially as set forth.

2. In paper-feeding apparatus, the combination with a feed-roll, of an overlying reverse-roll, a support therefor, a cross-bar above and parallel to said support, and adjusting mechanism carried by said support on either side of said reverse-roll and including a graduated member lying between said support and cross-bar, for adjusting said reverse-roll relatively to said feed-roll, substantially as set forth.

3. In paper-feeding apparatus, the combination with a feed-roll and an overlying reverse-roll, of a support for the shaft of said reverse-roll, bearing-blocks receiving such shaft, an adjustable connection between said bearing-blocks and said support, and a paper-stop loosely carried by said support and having portions arranged adjacent to either end of said reverse-roll, substantially as set forth.

4. In paper-feeding apparatus, the combination with a feed-roll and an overlying reverse-roll, of a shaft for said reverse-roll,

bearing-blocks receiving said shaft, a support for said blocks, an overlying cross-bar substantially parallel with said support, and a screw adjustment for said blocks operable between said support and cross-bar, substantially as set forth.

5. In paper-feeding apparatus, the combination with a separator-roll adapted to coact with the under side of a sheet pile, a feed-roll and an overlying reverse-roll adapted to receive the lowermost sheets successively from said separator-roll and sheet pile, of a support for said reverse-roll, a cross-bar parallel with said support, a member lying between said support and bar adapted to adjust the feed and reverse rolls relatively, and an endless belt rearward of said feed and reverse rolls and adapted to successively receive sheets therefrom, said feed-roll, reverse-roll separator-roll and belt being driven from a common source of power, substantially as set forth.

6. In paper-feeding apparatus, the combination with a separator-roll adapted to coact with the under side of a sheet pile, a feed-roll and an overlying reverse-roll parallel with said feed-roll, of a shaft for said reverse-roll, a support, threaded rods connected with said shaft, a bar adjacent to said support, and graduated nuts lying between said support and bar and coacting with said threaded rods and said support for adjusting said reverse-roll relatively to said feed-roll without throwing the same out of parallelism therewith, substantially as set forth.

7. In paper-feeding apparatus, the combination with a feed-roll and an overlying reverse-roll, of a shaft for said reverse-roll, bearing-blocks in which said shaft is mounted, a support, a bar overlying and substantially parallel with said support, threaded rods extending from said blocks, and nuts coacting with said rods and with said support and overlying bar, said nuts having graduated faces, the graduations thereon cooperating with an indicating-mark having a fixed position relatively to said support and overlying bar, substantially as set forth.

This specification signed and witnessed this 30th day of January, 1905.

ALBERT B. DICK.

Witnesses:

W. W. WATERBURY,  
R. R. HARRINGTON.