

No. 749,986.

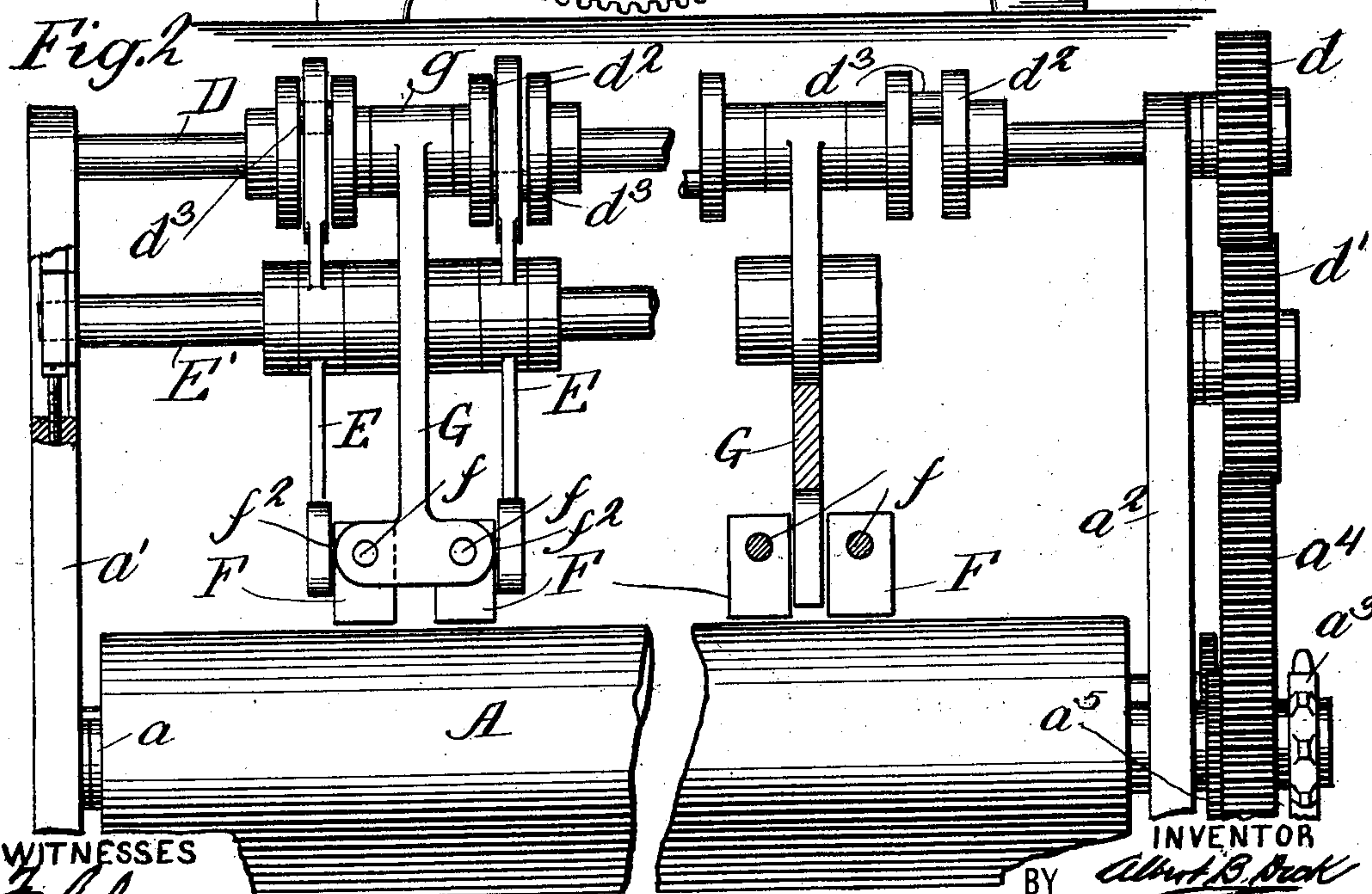
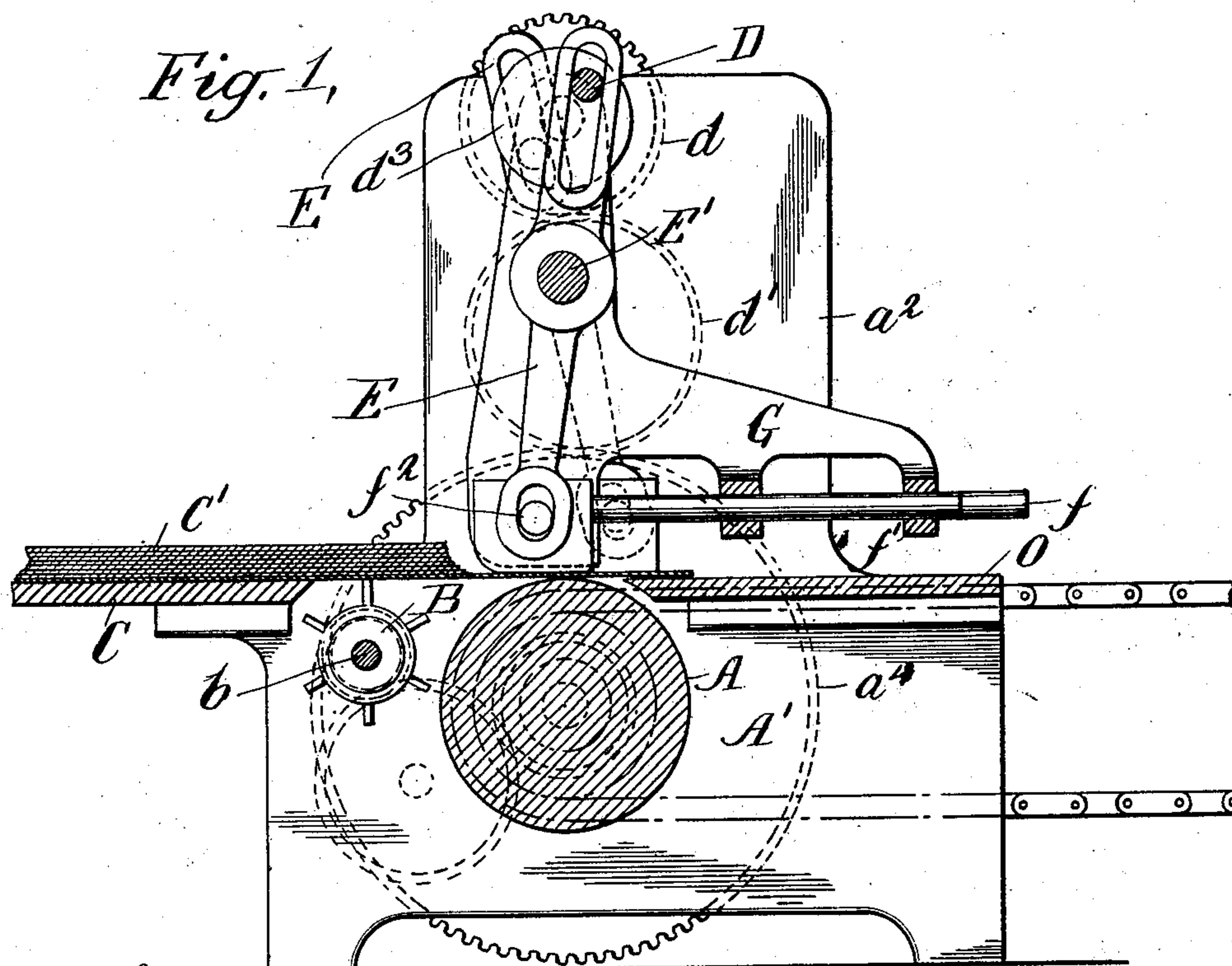
PATENTED JAN. 19, 1904.

A. B. DICK.  
PAPER FEEDING APPARATUS.

APPLICATION FILED AUG. 21, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES

*Raymond B. French*

INVENTOR

BY

*Albert B. Dick*  
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ATTORNEY





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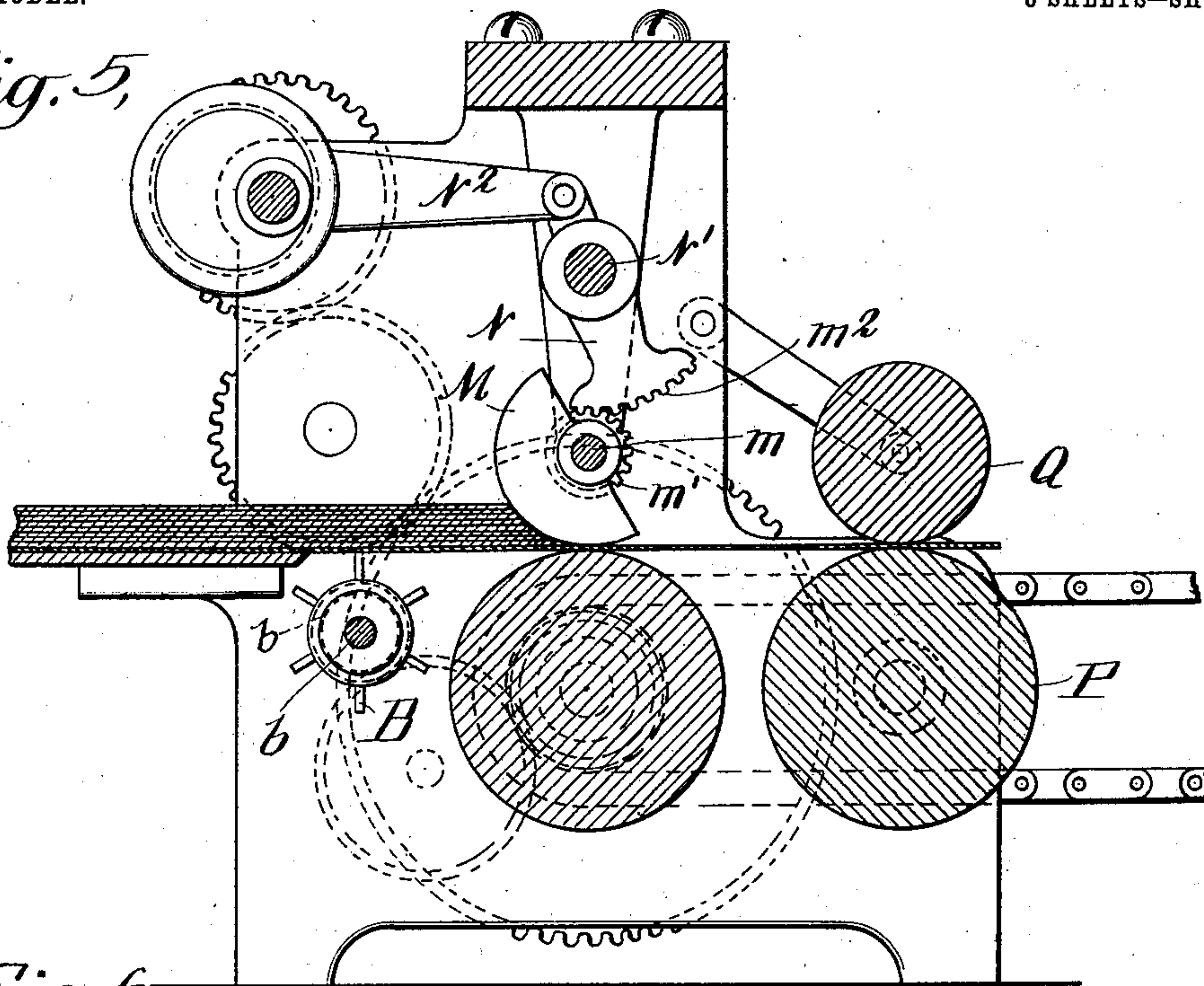
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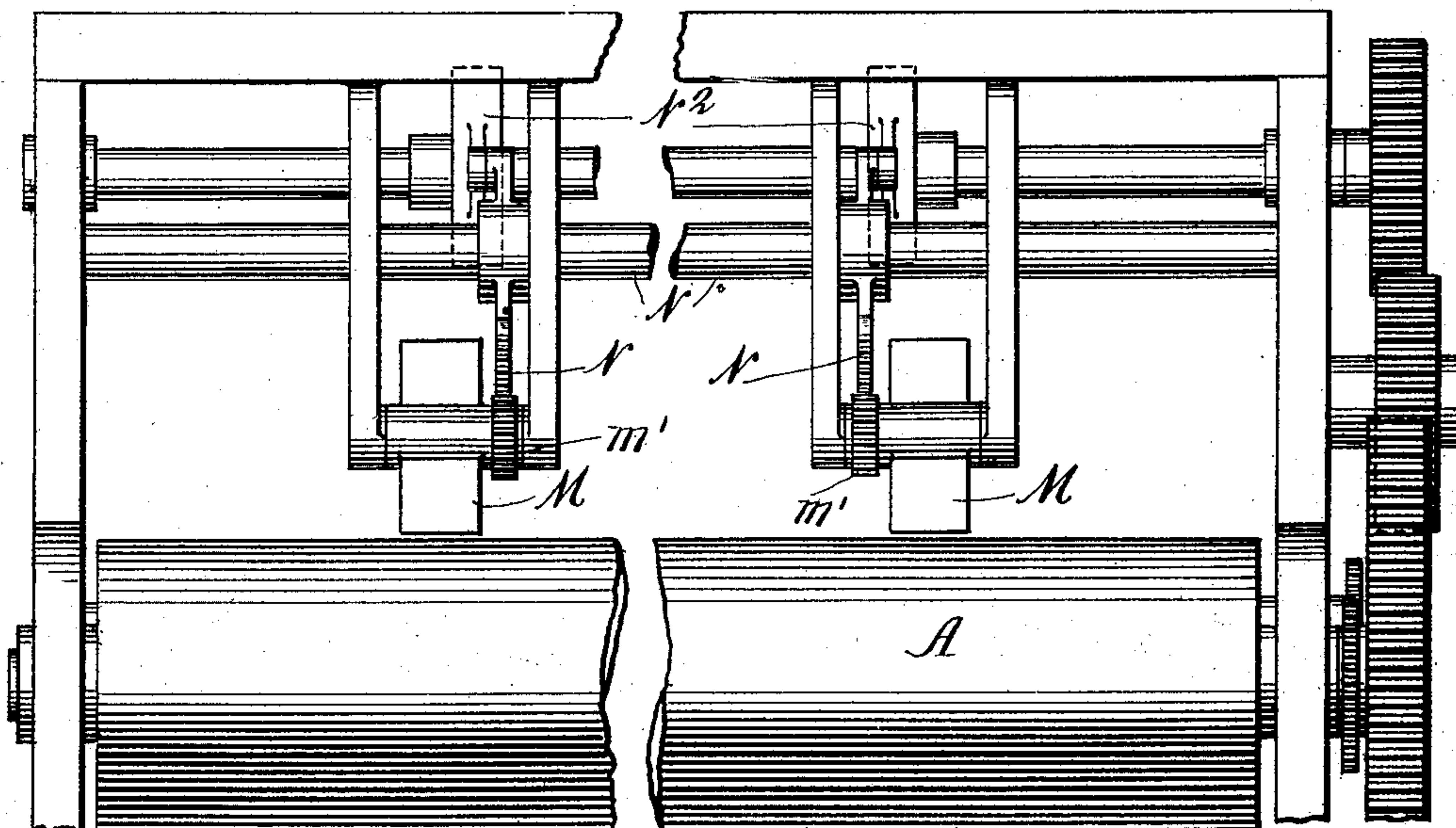
NO MODEL.

3 SHEETS—SHEET 3.

*Fig. 5,*



*Fig. 6,*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## PAPER-FEEDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 749,986, dated January 19, 1904.

Application filed August 21, 1903. Serial No. 170,276. (No model.)

*To all whom it may concern:*

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

The object of the present invention is to provide simple yet reliable apparatus for successively feeding sheets from a pile, and it is designed particularly for use in connection with printing or stencil duplicating machines, as set forth in application, Serial No. 167,901, filed in my name August 1, 1903.

In carrying out the invention a feeding device is employed, preferably in the form of two feed-rolls, to which movement, either continuous or intermittent, is imparted in any suitable manner. One of said feed-rolls coacts with the under side of a pile of sheets to feed the lowermost sheet forward over the other roll and thence to the printing or other mechanism. Obviously means must be provided for assuring the feeding of but a single sheet at a time. In the present instance such means consist of paper-stops located above the main feed-roll and movable relatively thereto into coaction with the paper pile, so as to restrain all of the sheets of such pile save the lowermost sheet from passing over the feed-roll. A plurality of such paper-stops is preferably employed arranged in the general plane of the feed-roll, but differentially operated, in order that the forward edge of the sheet to be fed may be passed squarely and in correct alinement through the machine. Said paper-stops are preferably operated by a connection with the single source of power from which all the parts of the sheet-feeding device are actuated. In a preferred form the paper-stops are given an oscillating movement toward and from the direction of travel of the paper sheets, such movement being imparted by suitable cams and levers. In another embodiment of the invention the same end is achieved by the use of paper-stopping shoes, also actuated by suitable cams and levers and movable, as in the form first referred to, toward and from the paper pile and in the di-

rection of travel of the sheets thereof. These forms of paper-stops operate in the same manner—*i. e.*, to permit only the lowermost sheet of the pile to be fed through the machine, restraining the sheets lying above such lowermost sheet until each in turn becomes lowermost in the pile, and therefore in position to be fed to the printing or other mechanism.

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

Figure 1 is a central vertical section, and Fig. 2 an end view, of a paper-feeding apparatus employing my invention. Fig. 3 is a central vertical section, and Fig. 4 an end view, illustrating a somewhat modified form of such apparatus. Fig. 5 is a central vertical section, and Fig. 6 an end view, illustrating a further modification.

Referring first to that form of the invention illustrated in Figs. 1 and 2, A designates a feed-roll, preferably having a rubbered periphery and carried by a shaft  $a$ , mounted in the side members  $a'$   $a''$  of the frame A'. One end of the shaft A projects through the side member  $a''$  of the frame and is here provided with the driving-sprocket  $a^3$ , the gear  $a^4$ , and the gear  $a^5$ , the purpose whereof will be presently explained. B designates an auxiliary feed-roll, here shown as provided with a fluted exterior and mounted on a shaft  $b$ , one end whereof projects through the side member  $a''$  of the frame, where it is provided with a gear  $b'$ , meshing with an idler-gear, which in turn meshes with the gear  $a^5$ . The movement imparted to the main feed-roll A in the present case is a continuous rotary movement, although a suitable stop device may be employed to give it intermittent movement, as clearly shown and explained in my former application above referred to, and due to the coaction of the gears  $a^5$  and  $b'$  the movement of the auxiliary feed-roll B will also in the present instance be continuous. C designates a feed-board upon which is laid the pile of sheets C', the forward end whereof rests upon the periphery of the auxiliary feed-roll B. D designates a crank-shaft mounted in the side members  $a'$   $a''$  of the frame, one end thereof projecting through



the side member  $a^2$ , where it is provided with a gear  $d$ , meshing with a gear  $d'$ , which in turn meshes with and is driven by the main gear  $a^4$ . Intermediate of its ends the crank-shaft D is provided with crank-disks  $d^2$ , connected by crank-pin  $d^3$ , with which coact the upper slotted ends of paper-stop levers E, a series of which are mounted upon the shaft E', extending between and mounted in the side members  $a' a^2$  of the frame. Each paper-stop F is here shown as provided with a shaft  $f$ , journaled in bearings  $f'$ , formed on the downwardly-depending ends of a bracket G, here shown as loosely mounted, by means of sleeve  $g$ , upon the shaft D and prevented for rotating with said shaft by the shaft E', which passes through such bracket. Each of said brackets G forms a guide and support for a pair of said paper-stops F, and each paper-stop F is provided with a pin  $f^2$ , coacting with the lower slotted end of its actuating-lever E. The crank-pins  $d^3$  of each pair of paper-stops are oppositely arranged in order that upon the rotation of the crank-shaft D one of said paper-stops will be moved forward as the other is moved backward. Each of said paper-stops is here shown in the form of a block, which may, if desired, be of metal, those portions coacting with the paper being suitably faced with rubber or other material. The forward lower edge of each of said blocks is curved, as shown in Fig. 1, in order to bevel the edge of the pile of sheets when said pile is forced against it. In Fig. 1 the pile of sheets is shown as slightly withdrawn from the block for clearness. The curvature of the forward edge of such pile, however, is that which is given to it by the curvature of the blocks or stops F.

In practice I preferably employ two pairs of paper-stops such as those above described, one pair on either side of the machine. Also, preferably, the distance-stops will move in unison and the intermediate stops will move in unison, the former moving forward as the latter are moved backward, this being determined entirely by the position of the crank-pins  $d^3$ . By this means the forward edge of the advancing sheet will be fed squarely to the machine and kept in alinement. For the purpose of varying the relativity of the paper-stops F and the feed-roll A the shaft E' may, if desired, be made adjustable in a vertical plane. This may readily be accomplished by mounting the ends thereof in bearing-blocks carried by the inner faces of the side members  $a' a^2$  of the frame and positioned by means of screws.

Referring now to Figs. 3 and 4, illustrating a construction but slightly different from that shown in Figs. 1 and 2, here the feed and auxiliary rolls may be the same as those above described, the main driving-gear H transmitting movement through the gear H' to a gear  $h$ , carried by the end of the shaft  $h'$ , mounted

in brackets  $h^2$ , extending upwardly from the main frame of the apparatus. Mounted upon the shaft  $h'$  is a series of cams  $h^3$ , coacting with annuli  $h^4$ , carried by the ends of reciprocating bars  $h^5$ . The forward ends of said bars  $h^5$  are guided in a bearing-block I, extending from one end to the other of the apparatus and forward of which are arranged the paper-stops. These are shown in Figs. 3 and 4 as comprising blocks L, mounted in housings  $l$ , secured to the arms  $h^5$ . Each of said paper-stop blocks L is provided with an adjusting-screw  $l'$  and jam-nut  $l^2$ , by means whereof the relativity of such blocks and the subjacent feed-roll may be varied. Here, as before, the paper-stops are arranged in pairs, and the cam movement is such as to make the distant-stops operate in unison and the intermediate stops in unison, the former moving forward as the latter are moved backward.

Referring now to Figs. 5 and 6, a further modification is shown herein, a cam movement very similar to that illustrated in Figs. 3 and 4 being employed and paper-stops M in the form of semicircular shoes substituted for the rectangular blocks F. The stops M (the operative portion of the periphery of each whereof is preferably faced with rubber) are mounted upon a shaft  $m$ , each being provided with a gear (or segmental gear)  $m'$ , meshing with a segmental gear  $m^2$ , formed on the lower end of a lever N, pivoted upon the shaft N' and its upper end connected with the crank-arm N<sup>2</sup>. Here, as in both of the cases previously referred to, the connections with the driving mechanism are such that the outside paper-stops will operate in unison and the intermediate paper-stops in unison, the former being moved forward (see position Fig. 5) while the latter are moved backward.

The operation of the various forms of paper-stopping apparatus above described is substantially the same, certainly so far as concerns the feeding of the sheets therethrough. The paper-stops, whether in the form of oscillating blocks or curved and pivoted shoes, coact with the forward edge of the pile to restrain all the sheets save the lowermost sheet from passing through the machine. The lowermost sheet, fed forward by the auxiliary feed-roll and the main roll, is permitted to pass forward free of the pile before the next sheet above becomes the lowermost sheet and is in turn operated upon. The sheets as passed over the feed-roll may be delivered upon a bed O or, if desired, to another pair of rolls P Q, as illustrated in Figs. 5 and 6, the former being journaled in the side members of the frame, while the latter may take the form of gravity-rolls mounted upon arms loosely pivoted to the frame to permit said rolls to bear with their entire weight upon the passing sheet in order to assure best contact of the rubbered periphery of the roll P therewith.



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

1. In sheet-feeding apparatus, the combination with a bed adapted to receive a pile of sheets, and a feed-roll coacting with the under side of said pile, of a paper-stop in juxtaposition thereto, and means for intermittently moving said paper-stop in a plane substantially coincident with the direction of travel of said sheets; substantially as set forth.

2. In sheet-feeding apparatus, the combination with a bed adapted to receive a pile of sheets, and a feed-roll coacting with the under side of said pile, of a series of paper-stops in juxtaposition thereto, and means for intermittently moving said paper-stops in a plane substantially coincident with the direction of travel of said sheets, substantially as set forth.

3. In sheet-feeding apparatus, the combination with a bed adapted to receive a pile of sheets, and a feed-roll coacting with the under side of said pile, of a series of paper-stops in juxtaposition thereto, and mechanism for intermittently moving certain of said stops in unison in a plane substantially coincident with the direction of travel of said sheets, substantially as set forth.

4. In sheet-feeding apparatus, the combination with a feed-roll, of a series of paper-stops, and means for moving certain of said stops in unison in one direction and certain others in unison in another direction, substantially as set forth.

5. In sheet-feeding apparatus, the combination with a feed-roll, of an auxiliary feed-roll coacting with the under side of the sheet pile, and a paper-stop intermittently coacting with the forward edge of said pile and means for operating the same in a plane substantially coincident with the direction of travel of the sheets, substantially as set forth.

6. In sheet-feeding apparatus, the combination with a feed-roll, of an auxiliary feed-roll coacting with the under side of the sheet pile, a series of paper-stops, and means coacting therewith for moving said stops, in a plane substantially coincident with the direction of travel of the sheets, into operative relation to the forward edge of said pile, substantially as set forth.

7. In sheet-feeding apparatus, the combination with a feed-roll, of an auxiliary feed-roll coacting with the under side of the sheet pile, a series of paper-stops, and means coacting therewith to move said stops intermittently, in a plane substantially coincident with the direction of travel of the sheets, into opera-

tive relation to the forward edge of said pile, substantially as set forth. 60

8. In sheet-feeding apparatus, the combination with a feed-roll, of an auxiliary feed-roll coacting with the under side of the sheet pile, a series of paper-stops, and means coacting therewith for intermittently moving said stops into operative relation to the forward edge of said pile, certain of said stops being simultaneously moved to inoperative position, substantially as set forth. 65

9. In sheet-feeding apparatus, the combination with a feed-roll and means for passing sheets over the same, of a paper-stop in juxtaposition to said feed-roll, and means for moving the same back and forth in a plane coincident with the direction of travel of said sheets, substantially as set forth. 70 75

10. In sheet-feeding apparatus, the combination with a feed-roll and means for passing sheets over the same, of an adjustable paper-stop in juxtaposition to said feed-roll, and means for moving the same back and forth in a plane coincident with the direction of travel of said sheets, substantially as set forth. 80

11. In sheet-feeding apparatus, the combination with a feed-roll and means for passing sheets over the same, of a series of adjustable paper-stops coacting with said sheets, and means for moving the same back and forth in a plane coincident with the direction of travel of said sheets, certain of said stops being moved in one direction while the others are moved in a contrary direction, substantially as set forth. 85 90

12. In sheet-feeding apparatus, the combination with a feed-roll and means for passing sheets over the same, of a paper-stop, and means, including crank mechanism, for intermittently moving said paper-stop, in a plane substantially coincident with the direction of travel of said sheets, to operative position, substantially as set forth. 95 100

13. In sheet-feeding apparatus, the combination with a feed-roll and means for passing sheets over the same, of a series of paper-stops, and means, including crank mechanism, for intermittently moving said paper-stops, in a plane substantially coincident with the direction of travel of said sheets, to operative position, substantially as set forth. 105

This specification signed and witnessed this 14th day of August, 1903. 110

ALBERT B. DICK.

Witnesses:

R. R. HARRINGTON,  
M. H. BURKART.