

No. 815,689.

A. B. DICK.

PATENTED MAR. 20, 1906.

DUPLICATING APPARATUS.

APPLICATION FILED OCT. 4, 1904.

3 SHEETS—SHEET 1.

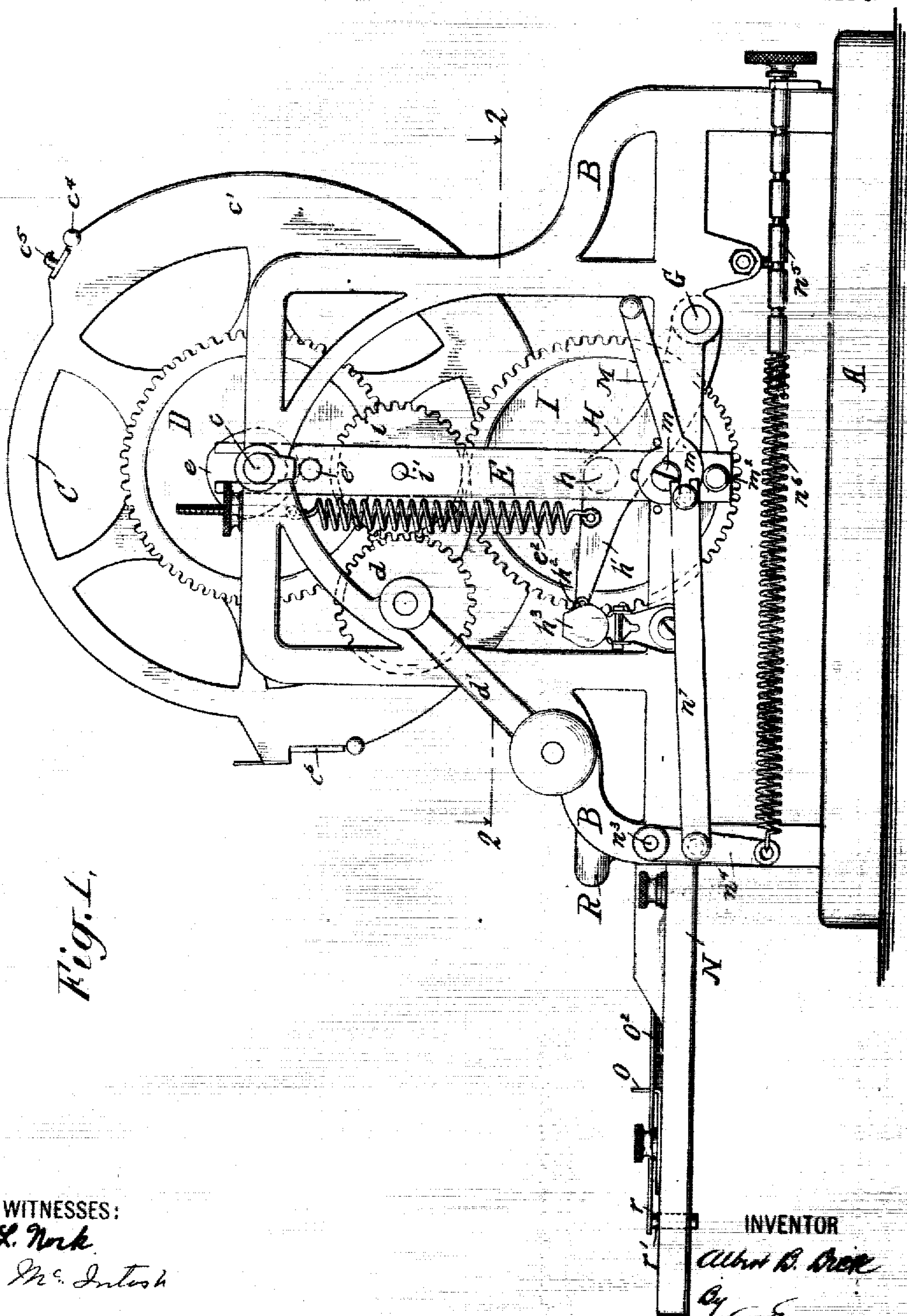


Fig. 1.

WITNESSES:

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3 SHEETS—SHEET 2

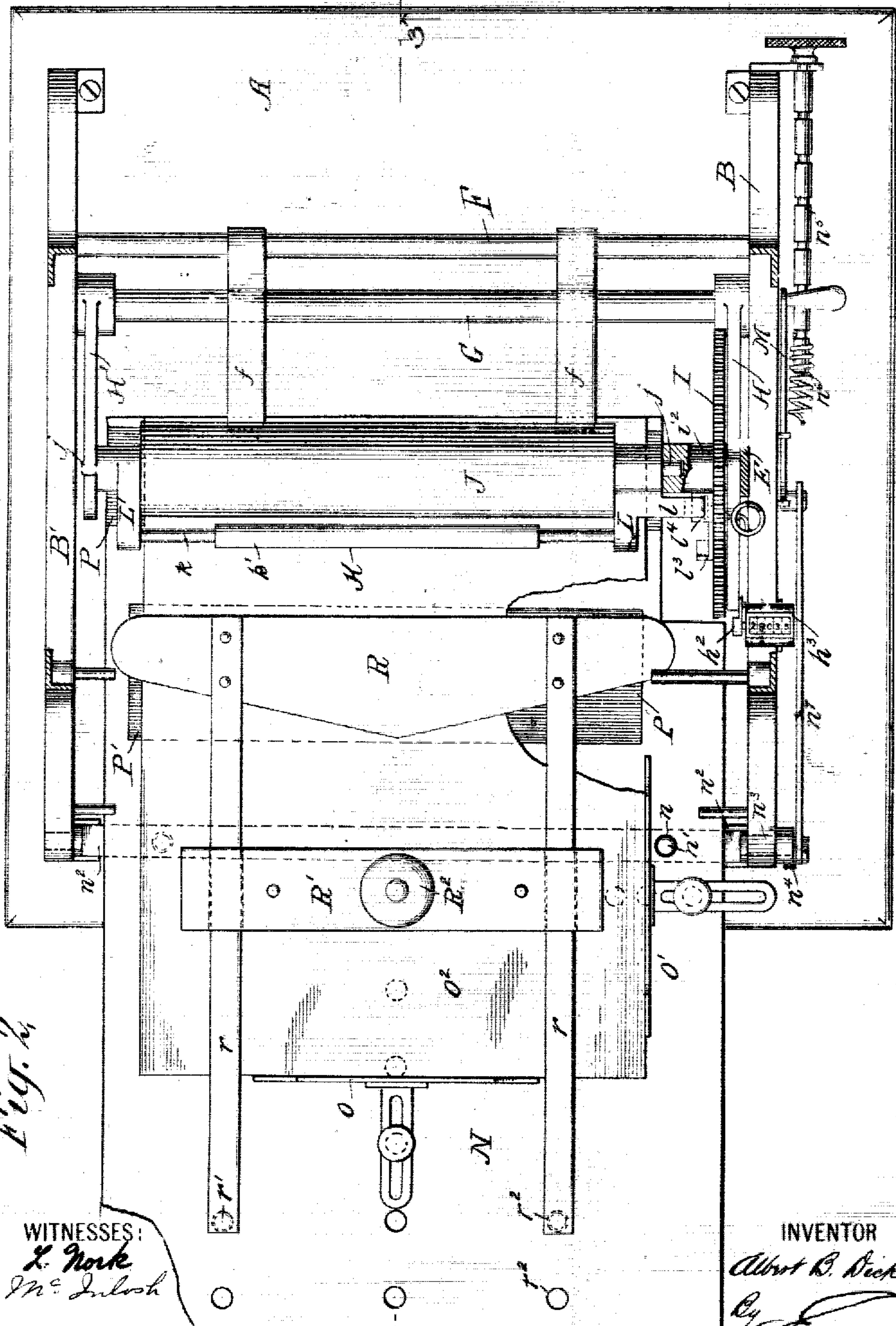


Fig. 2.

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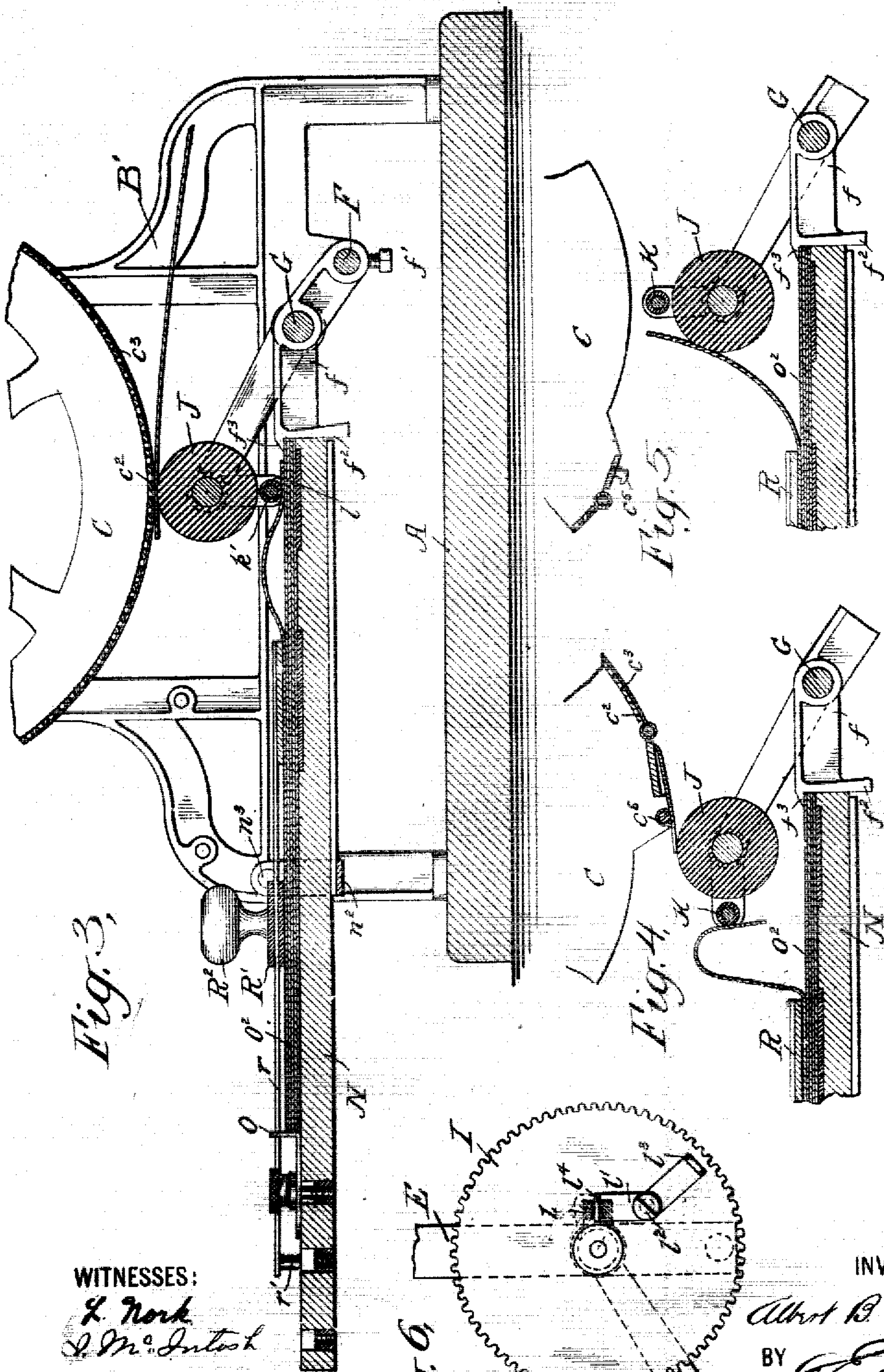
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3 SHEETS—SHEET 3.



WITNESSES:

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Fig. 6

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

DUPLICATING APPARATUS.

No. 815,689.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed October 4, 1904. Serial No. 227,187.

To all whom it may concern:

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

This invention relates generally to apparatus for the duplication of written or typewritten matter, and particularly to that type of such apparatus in which is employed a revoluble drum, upon the surface whereof a stencil-sheet is suitably supported, ink being fed through the interstices therein to the impression-paper with which the periphery of such drum is brought into contact.

The object of the invention is to perfect duplicating apparatus of the type referred to, particularly with respect to the feeding of the impression-paper to the drum, and this is accomplished in a highly efficient manner and without unnecessary complication in the present embodiment of the invention, which will now be described.

In the drawings, Figure 1 is a side view of a duplicating apparatus employing my invention. Fig. 2 is a plan view on the line 2 2, Fig. 1, and looking in the direction of the arrows on the last-named figure. Fig. 3 is a central cross-section on the line 3 3, Fig. 2, and looking in the direction of the arrows on said last-named figure. Figs. 4 and 5 are sectional details illustrating certain steps in the feeding of an impression-sheet for coaction with the stencil on the drum of the machine, and Fig. 6 is a detail view of a latch mechanism hereinafter described.

Referring to the drawings, in which similar letters denote corresponding parts, A designates the base of the machine, upon which are supported the side frames B B', in which is journaled at c the drum C, comprising the heads c' and a stencil-carrier c'', of perforated material, adapted to support an ink-pad c', held in position by bars c', and over which pad is placed the stencil of waxed paper or other material, the forward end thereof being secured on the drum by means of the studs c'' and the rearward end by means of clamp c''. One of the drumheads c' is provided with a pinion D, which meshes with a similar pinion d, supported by the frame-plate B and to which movement is transmitted—as, for instance, by means of the crank

d'. Said drumhead c' also carries a cam e, meshing with a sheave e', carried by a vertically-reciprocating bar E, normally held in its uppermost position and against said cam e by any suitable means, such as the spring e'', as hereinafter described. Said reciprocating bar E is guided and held in place at its upper end by a bifurcation, within which the shaft e of the drum is received.

F designates a cross-rod extending between and connecting the side members B B' of the frame. Mounted upon this cross-rod are paper-stops f, here shown as having set-screws f', by means whereof they may be adjusted upon said cross-rod. Each of said paper-stops is provided with a vertical forward edge f'' and with a projecting lip f'', the purpose whereof will presently be explained. I have shown two of these paper-stops in the present embodiment of the invention, but it will be understood that the number may be varied as desired.

G designates a rock-shaft journaled at either end in the side members B B' of the frame. This rock-shaft is here shown as passing through the paper-stops f; but this construction may be modified, if desired, the shape of such stops being changed to avoid interference between them and said rock-shaft. Adjustably secured adjacent to each end of said rock-shaft G and within the side members B B' of the frame are arms H H'. The vertically-oscillating bar E is pivoted at h to the arm H, as clearly shown in Fig. 1. Said arm H is provided with an extension h', having a link connection h'' with the shaft of the cyclometer h''. Pivoted also upon said arm H is a pinion I, meshing with a similar pinion i, pivoted at i' to the vertically-oscillating bar E and to which motion is transmitted by the pinion D. Mounted upon the inner face of the pinion I is a hub i'', and journaled in said hub is one end of a shaft j, the other end whereof is journaled in a bearing in the arm H', said shaft carrying the pressure-roller J.

K designates the feeder, here shown as comprising a rod k, a portion whereof, k', is rubber-covered, and this rod is supported at its ends in brackets L L', loosely mounted upon the shaft j of the pressure-roller J. The bracket L is provided with an extension l, lying parallel with the hub i'' of the pinion I, and this extension forms part of a latch mechanism,

(best shown in Fig. 2 and in Fig. 6,) which is an inner face view of the pinion I. This mechanism comprises the lever l' , pivoted to the pinion I at l^2 and having the handpiece l^3 .

5 The latch end of said lever is provided with an angular extension l^4 , adapted to coact with a slit formed in the extension l of the bracket L. The operative position of the feeder K is illustrated in the drawings. In
10 order to throw the same to inoperative position, it is only necessary to move the lever l' upon its pivot l^2 , whereupon the extension l^4 being withdrawn from the slit in the extension l of the bracket L the movement of the
15 pinion will not be transmitted to the feeder, but the same will remain idle.

In order that the machine as a whole may be thrown at will to operative or inoperative position, I provide a cam-lever M, pivoted at
20 m to the frame-plate B. This lever is provided with the cam m' , which coacts with a stud m^2 , formed on the lower end of the vertically-oscillating bar E. The operative position of the parts is illustrated in Fig. 1. To
25 throw the machine to inoperative position, it is only necessary to depress the cam-lever M, whereupon the bar E will be lowered out of the path of the cam e upon the drum, and this correspondingly depresses the pressure-
30 roller J, whose coaction with the drum is essential to the production of copies.

N designates the feed-board. This is detachably mounted in order that it may be removed from the position in which it is shown
35 in the drawings and placed in a new position to adapt the machine for hand-feeding, a feature which is not made the subject of this application. As here shown, the feed-board N is provided with perforations n , adapted to
40 receive studs n' , carried by a rock-bar n^2 , pivotally mounted at n^3 in the side members B B' of the frame. One of the pivots n^3 (that passing through the side frame B) is provided outside such side frame with a crank-arm n^4 ,
45 to the lower end of which is secured an adjusting device n^5 and spring n^6 for the purpose of applying yielding pressure to the feed-board N.

n^7 designates a lever extending between
50 and connecting the crank-arm n^4 and the cam-lever M. When, therefore, the free end of said cam-lever is depressed to throw the machine as a whole to inoperative position, the forward end of the feed-board (adjacent to
55 the stops f) is depressed. In the position of the parts illustrated in the drawings the upward movement of the forward end of said feed-board or of the paper-pile carried thereon is limited by the lips f^2 of said paper-stops; but in order to compensate for the diminishing thickness of the paper-pile, the
60 pressure of the spring n^6 is provided.

The feed-board N is preferably provided with an adjustable end guide O and a similar
65 side guide O' for the paper-pile O². Its up-

per surface is also provided with a facing P, of rubber or other suitable material, at a point directly under the pressure-roller J, this being the point of coaction of the feeder K with
70 said pile. Said board is also provided with another and similar facing P', rearward of the facing P, for the purpose presently to be described.

In order to assure reliable feeding and to assist in the buckling of the uppermost sheet, which is an incident of such feeding, I provide the feed-board N with an adjustable pressure device, here shown as comprising a bar R directly overlying the rubber facing P', and to which are secured arms r r , provided
80 at their ends with pins r' , adapted to be received in orifices r^2 r^2 , formed in the feed-board. Of said orifices there may be any desired number in order that the position of the pressure device may be varied at will. Car-
85 ried loosely by the arms r r and adapted to slide thereon is a weight R'. (Here shown as having handpiece R².) Said weight may be conveniently made of two metallic bars secured together by screws on either side of the
90 arms r r , or, if desired, the handpiece R² may take the form of a nut coacting with a bolt projecting upwardly from the lower member of the weight, thus making it possible to clamp the weight in position after it has been
95 adjusted. The pressure device bears downwardly upon the paper-pile, the bar R extending, as shown in Figs. 4 and 5, to the point at which the impression-sheet is buckled. This operation will readily be under-
100 stood from said figures. After the feeder K has been locked in operative position (in which it is shown in all of the figures) and movement applied to the drum such movement is transmitted through the pinions i
105 and I to said feeder, which thereupon revolves around the pressure-roller J. The first portion of the operation of feeding the uppermost sheet of the pile is illustrated in Fig. 3. Here the feeder has seized the forward
110 edge of the uppermost sheet and is pressing the same rearwardly. In Fig. 4 the continued movement of the feeder has resulted in the buckling of such uppermost sheet, while in Fig. 5 it has passed out of en-
115 gagement with the sheet and the latter has sprung upwardly and against the pressure-roller J. This is the position occupied by the sheet just before the stencil-covered periphery of the drum comes into engagement with
120 the pressure-roller. When said parts come into engagement, the impression-sheet is gripped between the drum and pressure-roller and fed along between the same, the upward pressure of the pressure-roller re-
125 sulting in impressing upon the sheet the characters previously cut upon the stencil and through which the ink is fed from the pad c^2 . By reason of the construction of the paper-stops f and of the provision of yielding pres-
130

sure for the feed-board N the sheet-pile may be accurately positioned, preferably when the parts are thrown to inoperative position by the movement of the cam-lever M. The pile is pressed forwardly upon the feed-board until it comes into engagement with the vertical edges f^2 of the paper-stops, whereupon the guides O and O' may be properly positioned and the weight R' adjusted. The parts being then thrown to operative position by elevating the free end of the cam-lever M and power applied as above described all of the sheets in the pile may be successively fed between the pressure-roller and drum and the impression printed upon the same in the usual manner.

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

1. In duplicating apparatus, the combination with a drum and means for supporting and operating the same, of a subjacent pressure-roller mounted upon a shaft movable relatively to said drum, brackets loosely carried by said shaft and supporting a feeder, an extension formed on one of said brackets, and a latch carried by a moving part of the apparatus and adapted to coact with said extension, substantially as set forth.

2. In duplicating apparatus, the combination with a drum and means for supporting and operating the same, of a subjacent pressure-roller, a movable feed-board adapted to receive a sheet-pile, paper-stops having substantially vertical edges terminating in proximity to the end of said feed-board, and lips extending over the edge of said feed-board and means for yieldingly pressing a sheet-pile on said feed-board into engagement with said lips, substantially as set forth.

3. In duplicating apparatus, the combination with a frame and a drum carried thereby, of a rock-shaft journaled in said frame and having arms, means for automatically moving said arms upon the operation of said drum, said means including a pinion, a shaft journaled at one end in a bearing carried by said pinion and at the other end in one of said arms, a pressure-roller carried by said shaft, a feeder mounted in brackets carried by said shaft, and a latch mechanism between said pinion and one of said brackets, substantially as set forth.

4. In duplicating apparatus, the combination with a frame and a drum carried thereby, of a subjacent pressure-roller movable relatively to said drum, a feeder operating around said pressure-roller, a pinion, a latch mechanism between said pinion and said feeder, and connections whereby said pinion may be operated upon the application of power to said drum, substantially as set forth.

5. In duplicating apparatus, the combination with a frame and a drum supported

thereby, of a rock-shaft carried by said frame and having projecting arms, a pressure-roller and feeder carried by said arms, and a vertically-oscillating bar connected with one of said arms and means for transmitting to said bar movement applied to said drum, substantially as set forth.

6. In duplicating apparatus, the combination with a frame and a drum supported thereby, of a rock-shaft carried by said frame and having projecting arms, a pressure-roller and feeder supported thereby, said feeder operating around said pressure-roller, a cyclometer, and a connection between the shaft thereof and one of the projecting arms carried by said rock-shaft, substantially as set forth.

7. In duplicating apparatus, the combination with a frame, a drum supported thereby, and a pressure-roller and feeder underlying said drum, of an adjustable feed-board and means for applying yielding pressure thereto, and facings of elastic material in the surface of said feed-board, one of said facings directly underlying said pressure-roller and feeder and the other being rearward thereof, substantially as set forth.

8. In duplicating apparatus, the combination with a frame, a drum supported thereby, and an underlying pressure-roller, of a feed-board having a facing of elastic material, means coacting with a sheet-pile on said feed-board to feed a sheet therefrom, and a pressure-bar adapted to overlie and bear upon said sheet-pile at the point of location of such facing, substantially as set forth.

9. In duplicating apparatus, the combination with a frame, a drum supported thereby, and an underlying pressure-roller, of a feed-board, and an adjustable pressure device adapted to coact with a sheet-pile placed thereon, said device comprising an adjustable pressure-bar and a sliding weight carried by arms connected with said bar, substantially as set forth.

10. In duplicating apparatus, the combination with a frame, a drum supported thereby, and an underlying pressure-roller, of a feed-board, and an adjustable pressure device connected with said feed-board and adapted to coact with a sheet-pile placed thereon, said device comprising an adjustable pressure-bar and an adjustable weight, substantially as set forth.

11. In duplicating apparatus, the combination with a frame, a drum supported thereby, and an underlying pressure-roller, of a feed-board, and an adjustable pressure device adapted to coact with a sheet-pile placed thereon, said device comprising an adjustable pressure-bar, arms extending therefrom, and a weight carried by and adjustable upon said arms, substantially as set forth.

12. In duplicating apparatus, the combination with a drum and a subjacent pres-

sure-roller, of an adjustable feed-board adapted to receive a sheet-pile, means for spring-pressing the rearward end of said feed-board upwardly, and a paper-stop having a lip adapted to limit the movement of said feed-board or the sheet-pile thereon toward said pressure-roller, substantially as set forth.

13. In duplicating apparatus, the combination with a frame, a drum supported therein, and an underlying pressure-roller, of an adjustable feed-board whose forward end underlies said pressure-roller, means for spring-pressing the rearward end of said feed-

board upwardly, paper-stops carried by said frame and terminating in substantially vertical portions adjacent to the end of said feed-board, and lips formed on said paper-stops and overlying the edge of said feed-board or of a sheet-pile placed thereon, substantially as set forth.

This specification signed and witnessed this 30th day of September, 1904.

ALBERT B. DICK.

Witnesses:

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