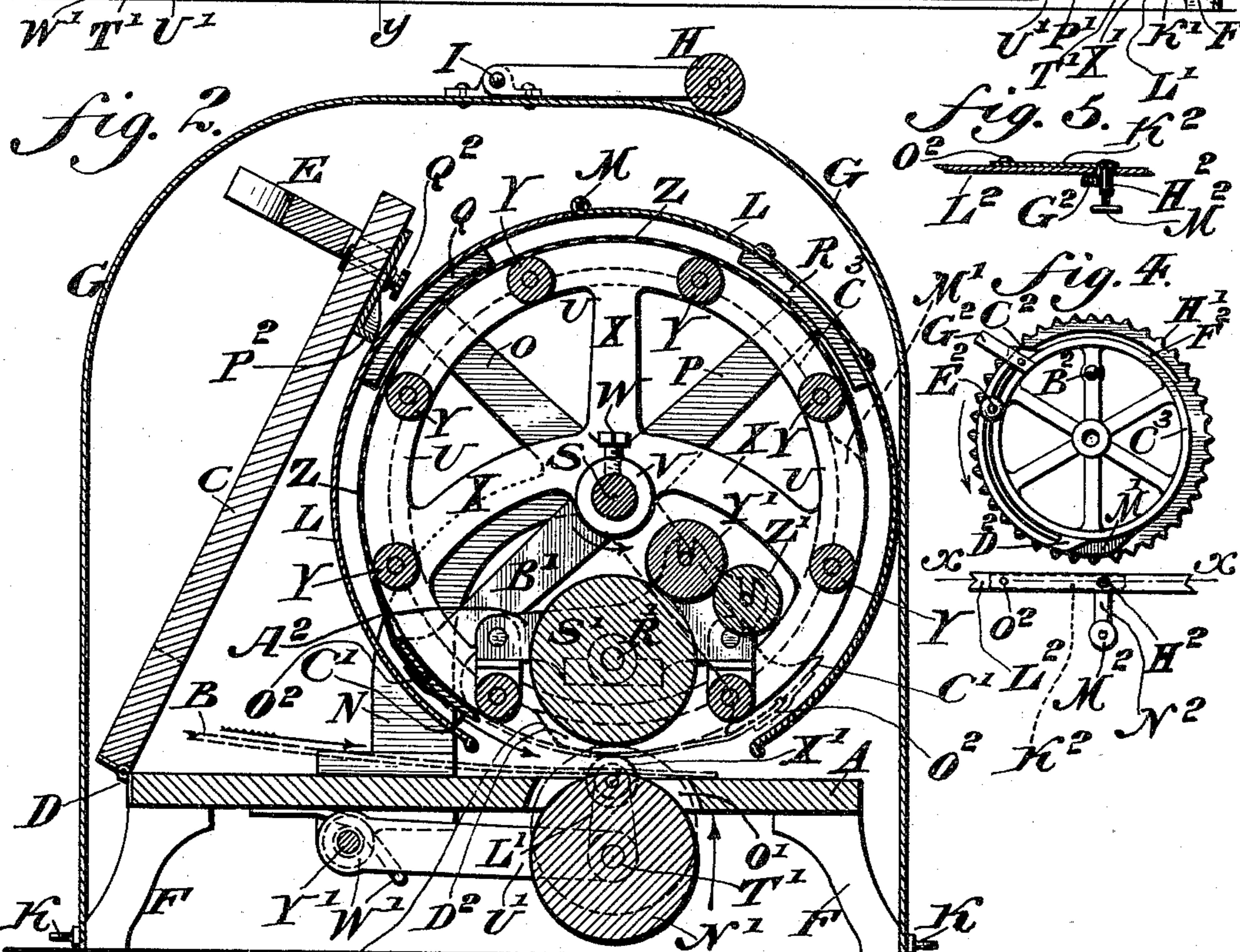


2 Sheets—Sheet 1.

Patented July 9, 1895.



**WITNESSES:**

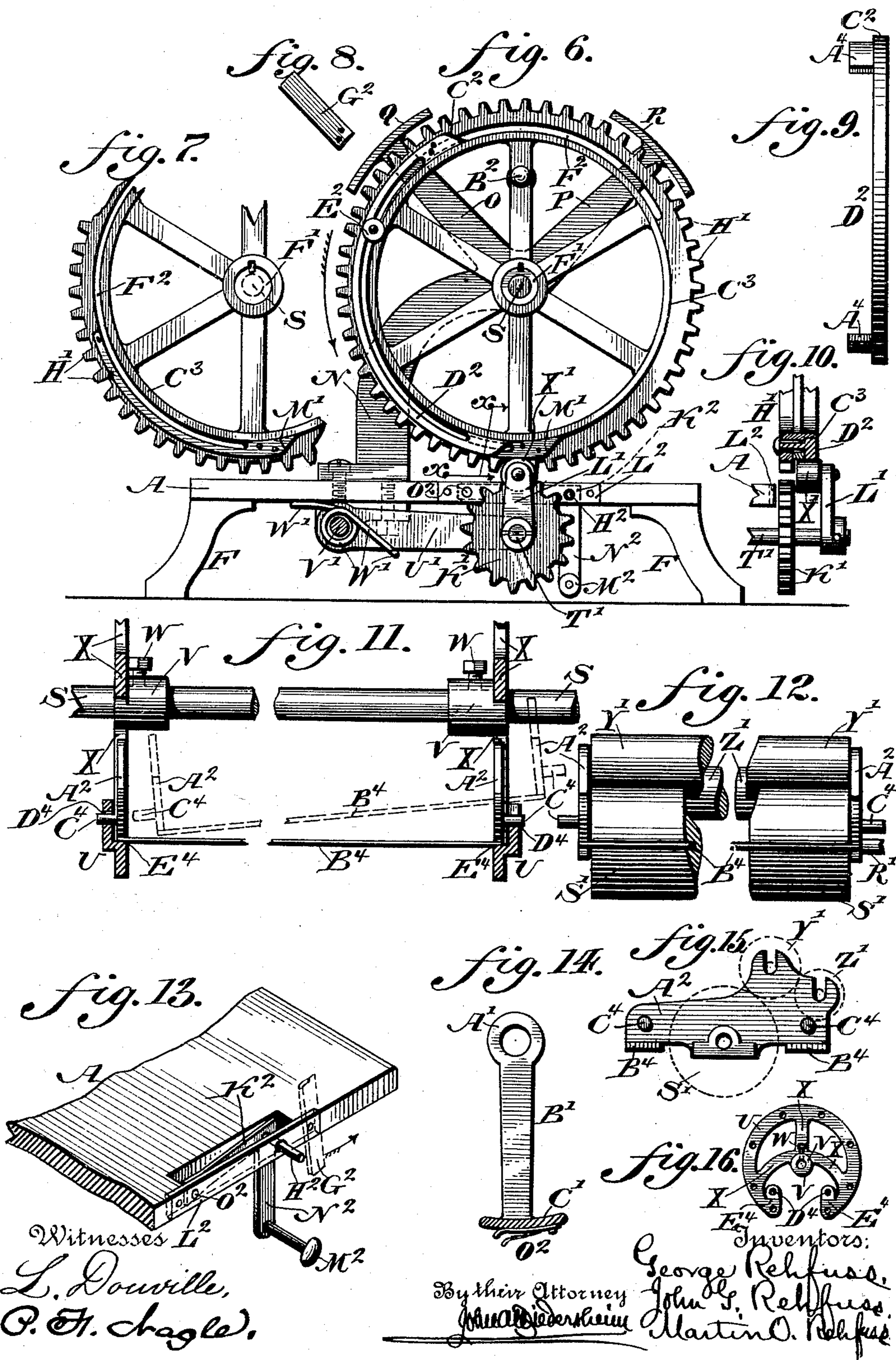
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2 Sheets—Sheet 2.

No. 542,497.

Patented July 9, 1895.



# UNITED STATES PATENT OFFICE.

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## ROTARY COPYING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 542,497, dated July 9, 1895.

Application filed April 23, 1894. Serial No. 508,640. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE REHFUSS, JOHN G. REHFUSS, and MARTIN O. REHFUSS, citizens of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Rotary Copying-Machines, which improvement is fully set forth in the following specification and accompanying drawings.

Our invention consists of a novel construction of rotary copying-machine, whereby a number of impressions can be readily and quickly reproduced from a single sheet of prepared material, means being provided for adjusting the machine according to requirements, all as will be hereinafter set forth.

Figure 1 represents a side elevation, showing the cover in section, of a rotary copying-machine embodying our invention. Fig. 2 represents a vertical section of the same on line *y y*, Fig. 1. Fig. 3 represents a detailed view of the same. Fig. 4 represents an end elevation on a reduced scale, showing the device for actuating the machine and the stop arrangement. Fig. 5 represents a section on line *x x*, Fig. 4. Fig. 6 represents, on an enlarged scale, an end view of Fig. 1, with the outer casing removed, showing the actuating ears, cams, coacting mechanism, &c. Fig. 7 represents a detail showing the bearing for the movable cam. Fig. 8 represents a detail showing the stop detached from the gear. Fig. 9 represents an end elevation of the movable cam, also detached from the gear. Fig. 10 represents an end elevation of the lower portion of Fig. 6. Fig. 11 represents a front elevation of the frame supporting the inking-rolls in position. Fig. 12 represents a similar view of said frame with the rolls journaled therein. Fig. 13 represents a perspective view, on an enlarged scale, of the stop for arresting the motion of the gear-wheel. Fig. 14 represents a side elevation, partially in section, of the revolving arm which carries the sheet of prepared material. Fig. 15 represents an end view of the frame which carries the inking-rolls. Fig. 16 represents an

end view of the frame or spider on which the frame carrying the ink-rolls is supported. 50

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates the bed of the press, adapted to receive a sheet of paper B, which is shown in dotted lines in Fig. 2 in the act of receiving an impression. C designates an extension of said bed, hinged thereto at D, and E designates a foot for the same, which serves as a support when the extension C is turned down. 60

F designates feet supporting the bed A.

G designates a casing adapted to inclose the machine when not in use, and H designates a handle hinged to the casing at I. The casing G may be attached to the feet F at K in any suitable manner when it is desired to transport the press, the extension C being folded up against the casing or housing L, as shown in Fig. 2, said casing L being made in two parts hinged at M. 70

N designates the base of frames or standards suitably secured to each end of the bed A and provided with the arms O and P, which terminate in the arc-shaped heads Q and R, which support the housing or casing L. One portion of the said housing L is riveted to the head R, the other half resting on the head Q, so that it can be readily lifted to provide access to the interior. In each of the frames N, at about the junction of the arms O and P, is supported the shaft S, which is prevented from rotating therein by the key T or some similar device. The shaft S also carries near each end a frame or spider U, which is provided with a hub V, said frame being prevented from rotating on the shaft S by means of the set-screws W and having the arms X radiating from the hub V. 85

In the frames U are journaled the rollers Y, which extend substantially parallel with the shaft S and with the said frames form a skeleton cylinder which serves as a support for the prepared paper or other material Z, by means of which the printing is done. 90

A' designates a hub adapted to be revolved on the shaft S, and is supported thereon in 95

the space between the left-hand frames U and N and the arm O, said hub having the arm B', Fig. 14, which carries the bar C', which, as shown in Fig. 1, extends across the press 5 and joins the arm D', which arm projects from the hub or sleeve E', the latter being on the hub F' and prevented from turning thereon by means of the set-screws G'. The said hub or sleeve F' passes through the right-hand frame or standard N and is adapted to revolve on the shaft S.

H' designates a gear which is integral with the hub F', said gear, therefore, being also adapted to be revolved on the shaft S.

15 K' designates a pinion carried by the shaft T', and is suitably supported below said gear H' and adapted at times to mesh therewith, and L' designates an arm mounted on the same shaft and carrying a roller X', which is at 20 certain times adapted to engage the cam M' on the wheel H'.

N' designates a feed roller journaled below the bed A and partly occupying the recess O'.

25 P' designates a gear adapted at certain times to mesh with the gear Q', which is secured to the same shaft R' as the inking-roll S'. The shaft T', which carries the roll N', gears P' and K', and arm L', is journaled in the arms U', one arm being located near each end 30 of the roll, as shown in Fig. 1, the other end of the arms U' being pivotally secured at V' to lugs on the under side of the bed A. W' designates springs located adjacent to said arms U', and bearing thereon in such man- 35 ner that they normally tend to keep the feed-roll N' in the position shown in Fig. 3, where it is contacting with the paper B, which is receiving the impression from the form or prepared material Z, against which the inking-roll S' presses.

40 Y' and Z' designate inking-rolls, which are adapted to rotate in bearings in a suitable frame, one end A<sup>2</sup> of which is shown in Figs. 12 and 14, which frame also supports the large inking-roll S'. The rolls Y' and Z' and 45 Y' and S' are adapted to be in contact with each other, as shown in Fig. 2.

The frame which supports the inking-rolls S', Y', and Z' consists of the side portions A<sup>2</sup> 50 and the cross-bar B<sup>4</sup>, said sides A<sup>2</sup> having the lugs or studs C<sup>4</sup>, which enter recesses D<sup>4</sup> in the spider U, the latter having ledges E<sup>4</sup>, which also assist to support said frame, one of said recesses D<sup>4</sup> being slotted, so that the 55 rolls and the supporting-frame can be readily removed, as seen in dotted lines in Fig. 11, through the end of the machine.

In the detail shown in Figs. 4 and 6 B<sup>2</sup> designates a handle by means of which the gear-wheel H' is rotated, the said gear having on a portion of its exterior face the cam M', adapted at certain times to come in contact with the roller X' on the arm or dog L'. The 60 said gear H' is faced off, so that it has the annular projection C<sup>3</sup>, on which is adapted

to slide the slotted arc portion D<sup>2</sup> of the cam, whose working face terminates at C<sup>2</sup>, said arc portion being provided with the projections A<sup>4</sup>, which enter the groove F<sup>2</sup>, the latter serving as a guide therefor. 70

The face C<sup>2</sup> of the movable portion D<sup>2</sup> of the cam is held in any desired position by means of the thumb-screw E<sup>2</sup>, which works in the groove F<sup>2</sup> in the gear H', whereby said movable part D<sup>2</sup> of the cam can be made fast 75 to the gear at any desired point, whereby the distance between the faces C<sup>2</sup> and M' can be varied at will.

G<sup>2</sup> designates a stop attached to the movable arc D<sup>2</sup>, which is adapted to abut at certain times against a pin H<sup>2</sup>, which is suitably secured to a flat spring, said spring being riveted at O<sup>2</sup> to a strap L<sup>2</sup>, as shown in Figs. 6 and 1 especially.

M<sup>2</sup> designates a push-button, which is connected to the spring K<sup>2</sup>, which carries the pin H<sup>2</sup>, by means of the part N<sup>2</sup>, so that a pressure upon the button M<sup>2</sup> will force the spring K<sup>2</sup> inwardly, and also the pin H<sup>2</sup>, thus allowing the stop G<sup>2</sup> to move on by it, as seen in 80 Fig. 13. The paper Z, from which the impression is taken, is preferably a sheet of paper coated with wax, upon which the matter to be reproduced is imprinted by means of a type-writer or similar apparatus, in the usual 85 way. The paper is then laid over the skeleton cylinder, and one edge of it is made secure to the part C' in any suitable manner, as at O<sup>2</sup>, Fig. 14. 90 95

P<sup>2</sup> designates a gage on the extension-piece 100 C, which can be held in any desired position by means of the thumb-screw Q<sup>2</sup>. The ink is applied to the rolls Y' and Z'. Thence it is evenly distributed upon the inking-roll S'.

The operation will now be apparent. Assume the parts to be in the positions shown in Fig. 2, the casing G being removed, and the hinged extension-piece C being let down and on a level with the table A. The pressure of the arc portion D<sup>2</sup> of the cam upon the roller 105 X', carried by the dog L', forces down the arms U, in which is journaled the shaft T', which carries the gears P' and K'. The paper B is then inserted between the inking-rollers S' and the feed-roll N', whose top is about on a line with the top of the bed A, and the gear H' is rotated. As the gear revolves in the direction of the arrow the face C<sup>2</sup> of the cam D<sup>2</sup> will leave the roller X', whereupon the parts will assume the position shown in Fig. 110 115 120 3, the arms U being forced upwardly by the spring W'. The gear or pinion K' now meshes with the gear H', and the gear P' meshes with the gear Q', causing the rollers S' and N' to revolve at the same time the prepared paper 125 Z, which is held by the holder O<sup>2</sup> and supported upon the skeleton cylinder, is being revolved adjacent to the sheet B, which is pressed against the same by means of the feed-roll N'. As the paper B passes through the 130

rolls the ink will be forced through the characters on the prepared sheet Z from the inking-roller S' within, so that the said characters will be clearly and sharply reproduced upon the sheet B. By the time all the characters have been reproduced on the paper the revolution of the gear H' will bring the face M' of the cam into contact with the roller X' and the feed-roller N' will be forced down, as in Fig. 2, and a further revolution of the gear H' will bring the stop G<sup>2</sup> up against the pin H<sup>2</sup>. The sheet B can then be removed and another one substituted. The button M<sup>2</sup> is then pushed in, allowing the stop G<sup>2</sup> to pass by the pin H<sup>2</sup>, and the operation can be repeated. The heading or margin at the top and bottom of the sheet to be printed on can be quickly and readily varied by adjusting the gage P<sup>2</sup> and the arc D<sup>2</sup> of the cam, which has the stop G<sup>2</sup> attached to it.

We are aware that reproducing or copying from prepared paper or other material is not broadly new, but it is believed that by adapting the reproducing material to be rotated and locating the inking device within the same, so that the ink is applied only to the inner periphery of the prepared paper, we attain the quickest possible manipulation of the same for performing the function for which it is intended, whereby we are enabled to make duplicate copies much more rapidly than heretofore, and at the same time copies can be made on a continuous sheet, which may be fed into the press from a roll suitably supported adjacent thereto.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. An arm adapted to be rotated, a strip of paper attached thereto, and suitably supported having thereon the characters to be re-produced, an inking roll located between the inner periphery of said paper and the axis of rotation, a feed roll, and means for actuating the arm and the rolls, said parts being combined substantially as described.

2. A skeleton cylinder, inking rolls suitably supported therein, a sheet of prepared paper supported upon said cylinder, a feed roll, means for revolving said paper between said rolls, and means for separating said feed and inking rolls at proper intervals, substantially as described.

3. An arm adapted to be rotated, a strip of paper attached thereto and suitably supported, having thereon the characters to be reproduced, an inking roll located between the inner periphery of said paper and the axis of rotation, and a feed roll, means for actuating said arm and roll, and means for causing said feed roll to approach and recede from the inking device at proper times, said parts being combined substantially as described.

4. A skeleton cylinder, an arm adapted to

be revolved, a sheet of suitably prepared paper attached thereto, a removable inking device supported within said skeleton cylinder, a feed roll, means for revolving the arm and rolls a cam and means for causing said feed device to approach and recede from the inking device at proper intervals, and said parts being combined substantially as described.

5. A skeleton cylinder, an arm adapted to be revolved, a sheet of suitably prepared paper attached thereto, a removable inking device supported within said skeleton cylinder, a feed roll, means for revolving said arm and roll, a cam, and means for causing said feed roll to approach and recede from the inking device at proper intervals, said cam being adjustable, and carrying a stop adapted to engage a spring-actuated pin suitably supported on the frame of the machine, said parts being combined substantially as described.

6. A skeleton cylinder, an arm adapted to be revolved and to carry a sheet of suitably prepared paper, an inking device within said cylinder, a feed roll supported on the spring-pressed arms U', gears Q', K', and P', dog L', gear H' carrying the adjustable cam, having the stop G<sup>2</sup> thereon, and the spring-pressed pin H<sup>2</sup>, adjacent thereto, said parts being combined substantially as described.

7. A skeleton cylinder, an arm adapted to be revolved and to carry a sheet of suitably prepared paper, an inking device within said cylinder, a feed roll supported on the spring-pressed arms U', gears Q', K', and P', dog L', and carrying roller X', gear H' carrying a cam having the stop G<sup>2</sup> thereon, and the spring-pressed pin H<sup>2</sup>, adjacent thereto, said parts being combined substantially as described.

8. A skeleton cylinder, an arm adapted to be revolved, and to carry a sheet of suitably prepared paper, an inking device within said cylinder, a feed roll supported on the spring-pressed arms U', gears Q', K', and P', dog L', gear H', carrying the adjustable cam, and the stop G<sup>2</sup>, the spring-pressed pin H<sup>2</sup> adjacent thereto, and the hinged extension C provided with a gage, said parts being combined substantially as described.

9. In a rotary copying machine, a movable arm, adapted to actuate a sheet of suitably prepared material, a frame about which said material is adapted to be revolved, an inking device supported within said frame, a feed roll adjacent said inking device, means for actuating said feed roll, and arm in unison, and means for causing said feed roll to approach and recede from said inking device at proper intervals, substantially as described.

10. In a rotary copying machine, a bed, a frame mounted thereon, an inking roll supported within said frame, a feed roll, said bed being interposed between said rolls, a movable arm, adapted to actuate a strip of suitable material, said material being adapted to

be passed between said rolls, in combination with means for actuating said arm, substantially as described.

11. In a device of the character described,  
5 a rotatable element, a strip of prepared material attached thereto, and suitably supported, having thereon the characters to be reproduced, an inking device located between  
10 the inner periphery of said paper and the axis of rotation, a feed roll, and means for actuat-

ing said rotatable element and said roll, the above parts being combined substantially as described.

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