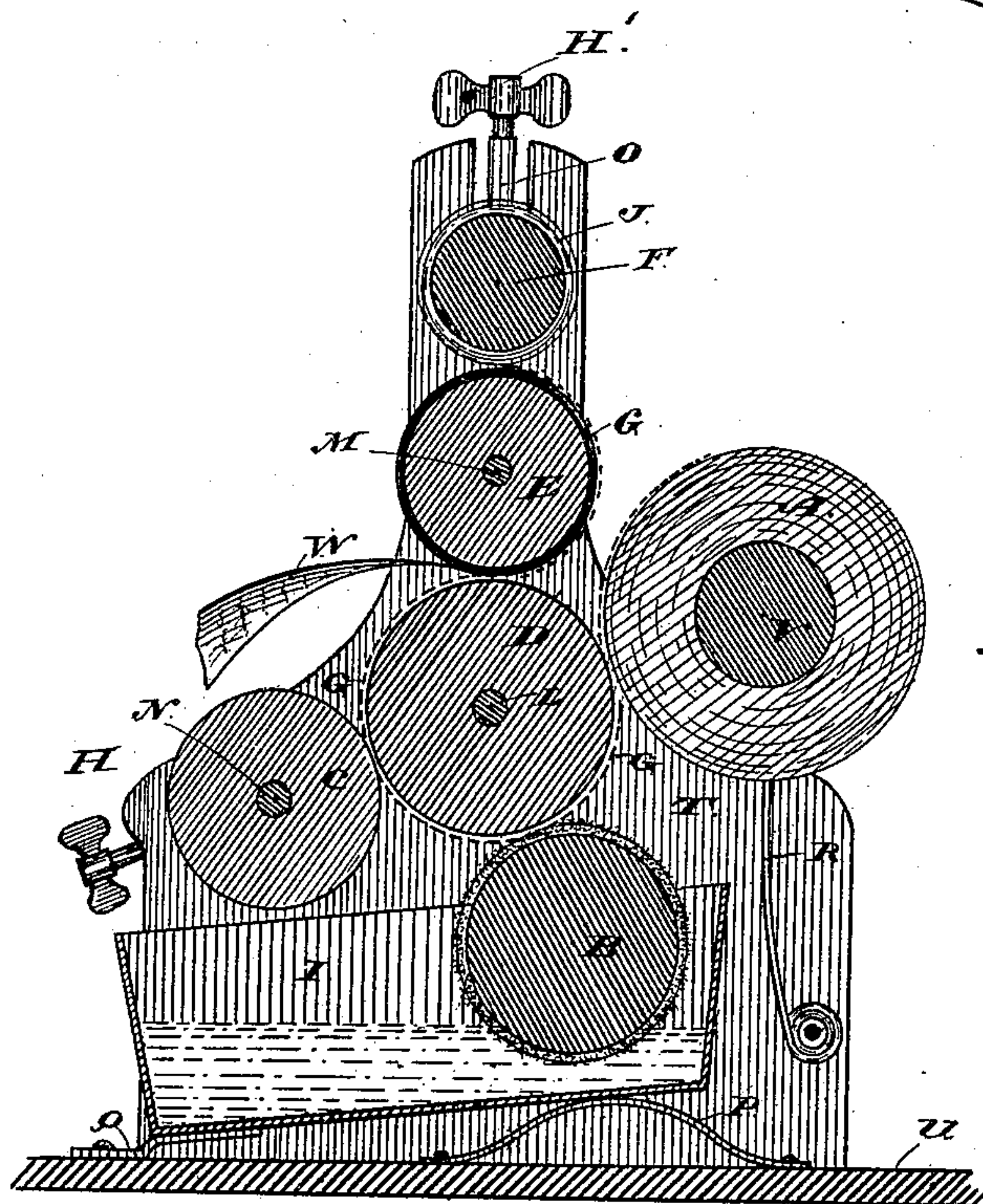
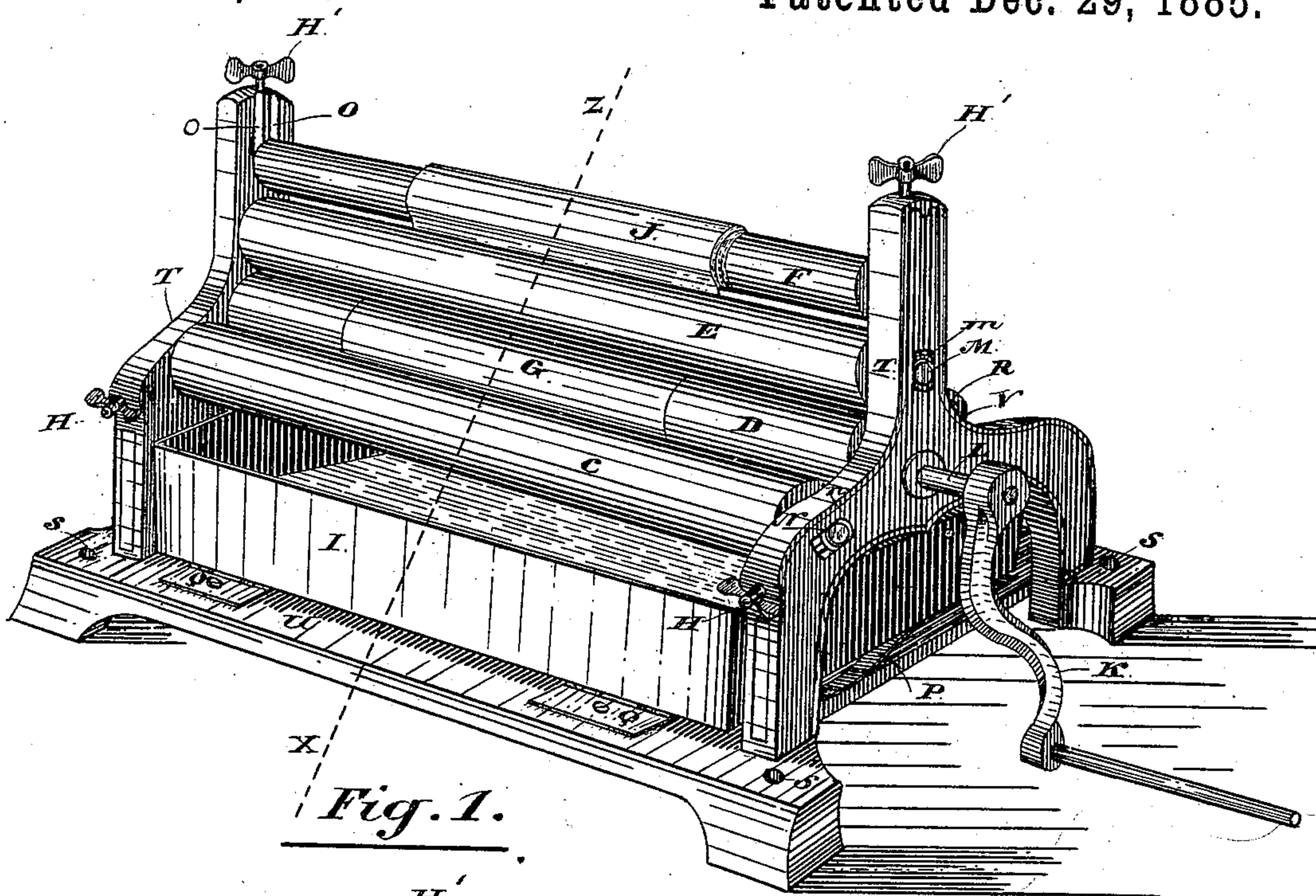


(No Model.)

J. F. LASH.
LETTER COPYING MACHINE.

No. 333,312.

Patented Dec. 29, 1885.



Witnesses.

Charles C. Baldwin
Jas. E. Mayhew

Inventor.

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by
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Attys

UNITED STATES PATENT OFFICE.

JOHN F. LASH, OF TORONTO, ONTARIO, CANADA, ASSIGNOR TO ZEBULON
AYTON LASH, OF SAME PLACE.

LETTER-COPYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 333,312, dated December 29, 1885.

Application filed August 25, 1884. Serial No. 141,448. (No model.)

To all whom it may concern:

Be it known that I, JOHN FANNON LASH, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, merchant, have invented certain new and useful Improvements in Letter-Copying Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

The invention relates to that class of machines known as "letter-copying machines or presses," whereby duplicates or copies of written matter may be made without the labor of transcribing; and it consists in the peculiar combinations and the construction and arrangement of parts hereinafter more fully described and claimed.

Figure 1 is a front perspective view of my letter-copying machine. Fig. 2 is a transverse or cross section of the same through X Z.

My invention is intended to be firmly attached to a table, desk, or counter, or other suitable stand, by means of screws or bolts, which may be inserted in the screw-holes at the four corners of the base or frame U, or by means of clamps or vises, or other suitable method.

The standards T and base or frame may be made of wood, but preferably of cast-iron, of any suitable or ornamental design or pattern, and the letter-press, when fixed in position, would occupy a space of about ten by fifteen inches.

A is a continuous roll of letter-copying paper, G, wound on a drum or cylinder, V, of about one inch in diameter, which drum is held in position by means of the wire springs R, which press the paper roll gently up against the main roller D as the paper becomes gradually unwound from the drum V, which drum is permitted to revolve, carrying with it the paper roll, by means of a circular lug at either end working in a bearing on the upper end of the spring R.

B is a damping-roller, about one and three-quarters inch in diameter and about twelve inches long, covered with a porous cloth or other flocculent material, which will readily absorb the water in the bottom of the drip-pan I. It presses gently against the main

roller, which communicates its motion to the damping-roller by friction. The damping-roller is held in position by means of a circular lug resting in a circular hole pierced in the metal drip-pan I in a suitable position.

C is a wringer, and is composed of a cylinder of vulcanized rubber. It is about one and three-quarters inch in diameter and about a foot in length. It presses gently against the main roller, which communicates to it by friction a revolving motion when the handle K of the machine is turned. Its function is to press out the surplus water which remains in the copying-paper G after it has passed between the damping-roller B and main roller D, the water pressed out falling again into the drip-pan I. This rubber cylinder C is formed around a metal axle, N, which is journaled in the standards T, and it may be adjusted or pressed closer to the main cylinder by means of the thumb-screws H and H'; or the contact-pressure may be lessened as occasion may require.

D is the main roller, made of vulcanized rubber around a circular metal shaft, L, which is journaled in the standards T. One end of this metal shaft is connected with the crank-handle K. It is the largest of all the cylinders, and is about a foot long and a little over two inches in diameter. It is the driving-cylinder of the machine, and communicates its motion to the rollers B, C, and E by frictional contact. The uncoiled paper G passes about three-fourths round the cylinder until it is taken up by the copying-roller E.

E is the copying-roller, of about the same size and form as the wringing-roller C. Its metal axis M is journaled in the standards T, and the cylinder may be adjusted and pushed closer to the main roller D by the thumb-screws H'; or the contact may be eased by unscrewing said thumb-screws as occasion may require. The uncoiled paper G passes about one-half way round this cylinder, when it is taken up by the gathering-up roller F, the letter or paper writing having been previously copied during the passage of the paper G and the said letter or paper writing between the copying-roller E and the main roller D.

F is the gathering-up roller, of about the same size as the roller on which the continuous coil of paper is placed, and, journaled by means of a circular lug at each end, works in slots O, open at the upper end. On this roller all the matter which has been printed or copied is automatically wound up, being pushed round by the adhesion of the dampened paper to its surface, the roller rising in the slots O as the printed paper on the roll increases.

I may here mention that before the machine is ready to be put in operation it is necessary to thread the end of the continuous roll of paper between the main roller D and damping-roller B, then between the wringer C and main roller D, then between the main roller D and copying-roller E, then half round the copying-roller E, and between the copying-roller E and gathering-up roller F, the course taken by the copying-paper unwound from the continuous roll being indicated by the dotted line G. (Shown in the cross-section in Fig. 2.) When the end of the copying-paper has reached the gathering-up roller F, the end of the copying-paper is wetted, and it is then wound once or twice round the roller F. This will afford sufficient adhesion. The motion of the revolving cylinder is of course sufficient to thread or carry the end of the copying-paper between the rollers; but in case the rollers are too closely or loosely in contact their contact may be adjusted, as aforesaid, by means of the thumb-screws H' H'.

In Fig. 1 the letter J indicates where the copying-paper has been gathered up on the roller F.

I is the damping or drip pan, made, preferably, of metal, and is tilted up to the front, the near side of the pan being kept up by two metal springs, P, on either end of the pan, so that the bottom of the pan may be nearly in contact with the damping-roller B. The pan I is partially filled with water, so that the damping cloth or material on the roller B may be fully saturated with the water during its revolutions. The pan also serves to receive the drip from the wringer C after it has wrung the surplus water out of the copying-paper G after passing between the main roller D and damping-roller B. The front of the said drip-pan I is hinged to the base or frame of the machine by the hinges Q, as shown in Fig. 1, or by the spring-metal pieces Q, as shown in Fig. 2.

R are wire springs, of ordinary construction, attached to the standards T of the machine, the upper end forming itself into a circular bearing of coiled wire for the circular pivots at either end of the cylinder, in which the continuous coil of paper is wound to work in. The thumb-screws or adjusting-screws H H' work through screw-holes cut in the standards, and the screw ends press against a movable journal resting against one side of the cylinder-axles M and N, the other side of the

cylinder-axles being pressed outward by reason of the elastic pressure of the cylinders against the main roller. The slots m and n, in which the journals and axles work, are of an oblong shape, as shown in the drawings, to allow of a lateral motion when adjustment is necessary.

The manner in which my letter-copying machine does its work is as follows: After the end of the continuous coil of paper has been threaded round the several cylinders by turning the handle K in the direction the hands of a watch follow, and guiding by a hand the ends between the cylinders, as shown by dotted line G in Fig. 2, the end of the copying-paper is wetted and attached by adhesion to the surface of the gathering-up roller F. Water is then placed in the pan I of sufficient depth to cause the bottom of the damping cylinder or roller B to be immersed. The wetting and wringing process then is set up in the machine, the paper wetted by passing between the roller B and main roller D is carried by the revolving cylinders between the wringing-roller C and the main roller D, the dry copying-paper being carried round the main roller and copying-roller E, and is wound onto the gathering-up roller F.

In threading the paper water may preferably be first placed in the pan or trough I, when the wetted paper can be passed between the several cylinders and attached to the gathering-up roller F, as before indicated. After the copying-paper G has left the wringer C it is in a fit condition and made ready to receive any impressions which may be communicated to it from a letter or paper written with copying-ink. When the portion of the paper so prepared and made ready reaches the contact-point between the revolving cylinders E and D, I insert squarely between the rollers the letter or other paper which has been written on with good copying-ink with its face downward. Said letter W is then carried through between the copying-roller E and main roller D, along with the prepared copying-paper G, the side written on of the letter or other paper being in close contact with the said copying-paper, and firmly pressed against it by means of the action of the revolving cylinders or rollers E and D. In this manner a clear impression is taken through the copying-paper, and the letter W, having passed through between these rollers E and D, may be removed by hand, and a new copy of the letter or paper writing may again be taken, if so desired, by inserting it again. Under favorable circumstances as many as ten successive copies may be made of the same letters. Meanwhile the letter which has been copied through the copying-paper G is carried upward half-way around the copying-roller E, and finally winds itself around the gathering-up roller F, along with the copies of the letters and papers which may have been previously copied.

I do not think it advisable to make use of perforated holes in the copying-paper to facilitate the detaching from the copying-roll of individual letters; but it is preferable to detach them when requisite by tearing the paper transversely across the sharp edge of a piece of wood or metal. When a large number of letters have been copied and the copies gathered up on the gathering-up roll F, the gathering-roll F and copied matter may be removed from the machine by tearing roll of paper and raising the gathering-up roller F, carrying copied matter, out of the slots O, when it may be carried away and laid on one side until it is convenient to separate the copies of letters and other writings and file them away for future reference. A spare gathering-up roller may then be placed in the slots O, the end of the copying-roll of paper again attached to it, as before indicated, when the letter-copying machine is again ready for further operations.

I disclaim the following as my invention: In a letter-copying apparatus, the combination of a roller containing a web or continuous sheet of copying-paper and two pressure rollers, one of which is moistened.

I also disclaim the following: The combination of two pressure-rollers, a roller bearing a continuous web of copying-paper, a winding-up roller, and means for moistening the said copying-paper.

What I claim as my invention is—

1. In a letter-copying machine in which the manuscript is copied on paper carried between two revolving rollers, a roller, B, arranged to damp the paper passing round the roller D, in combination with said roller D and the roller C, arranged to wring the paper on the roller D after it has passed the roller B.

2. In a letter-copying machine in which the manuscript is copied on paper carried between two revolving rollers, the rollers D, E, and F, around which the paper from the roll A is carried, in combination with the drum V, the damping-roller B, and wringing-roller C, arranged to wring the paper, and operating substantially as and for the purpose specified.

3. The combination of main roller D, copying-roller E, damping-roller B, wringing-roller C, arranged to wring the paper, and the drum V, bearing a continuous coil of paper passing through the said rollers, substantially as and for the purpose specified.

4. In a letter-copying machine, the combination of a main roller, D, a copying-roller, E, a wringing-roller arranged to press upon the paper, and a wetting apparatus, substantially as described.

Toronto, July 9, 1884.

J. F. LASH.

In presence of—

DONALD C. RIDOUT,
CHARLES C. BALDWIN.