

(No Model.)

J. F. LASH.

LETTER COPYING MACHINE.

No. 354,794.

Patented Dec. 21, 1886.

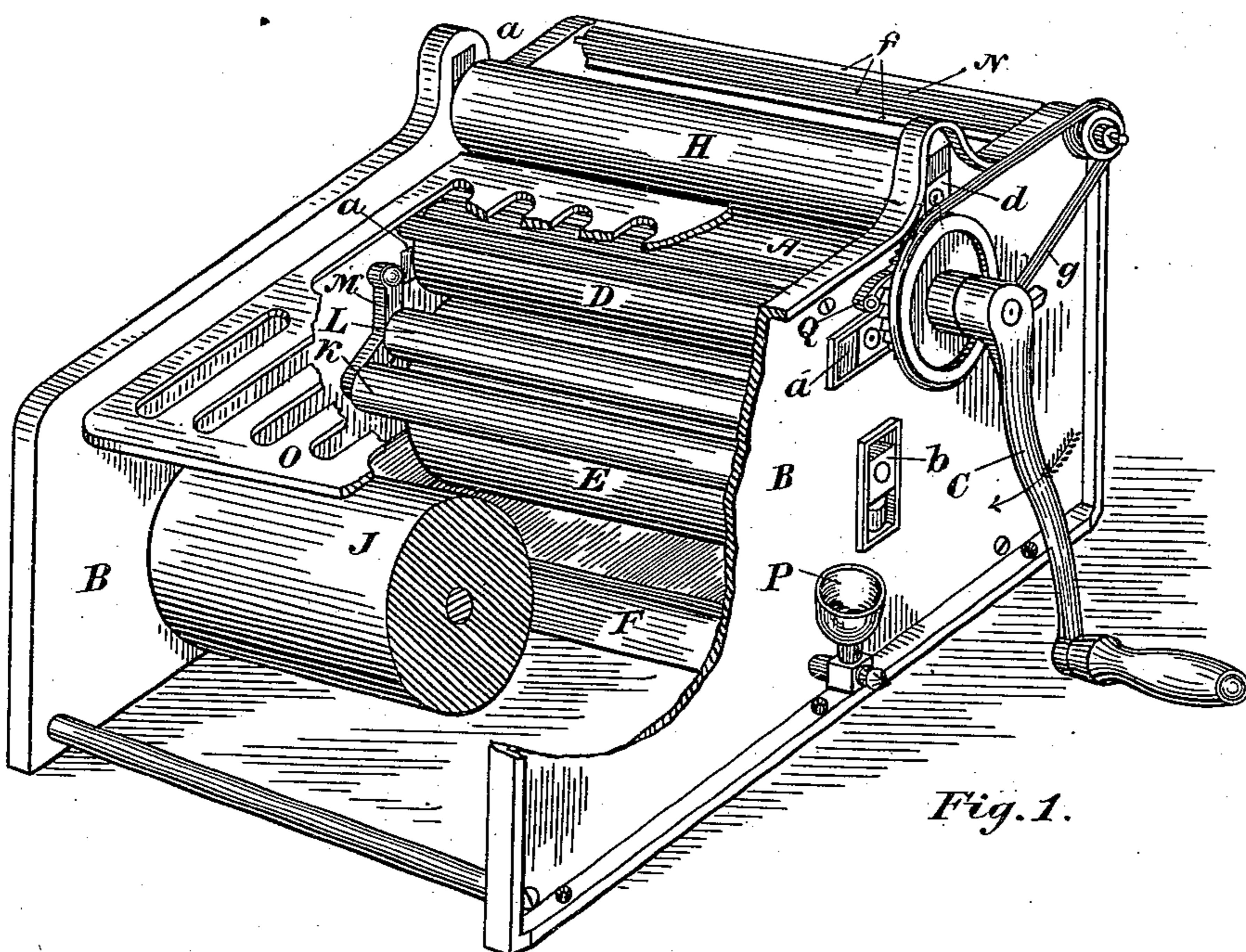


Fig. 1.

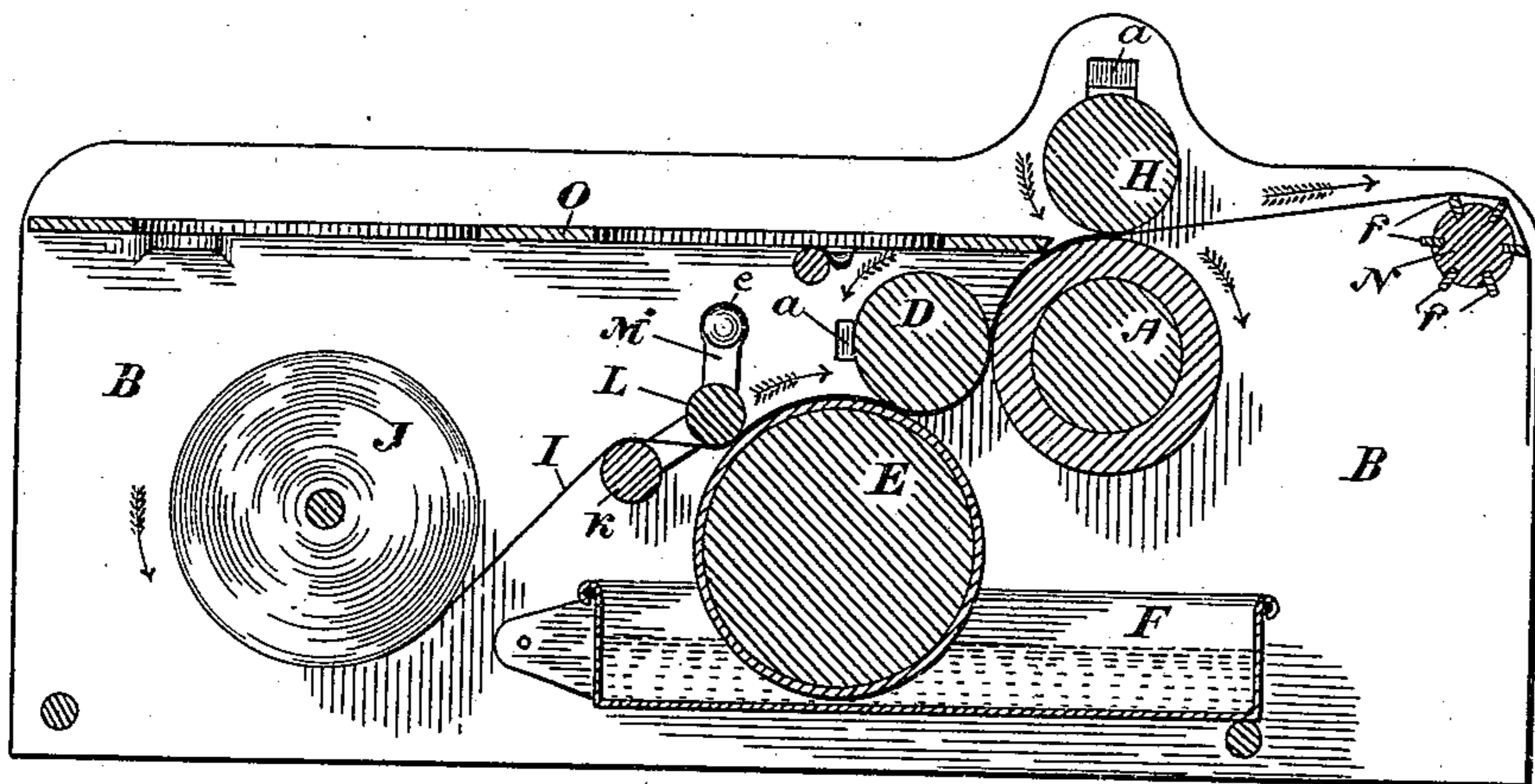


Fig. 2.

Witnesses.

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JOHN F. LASH, OF TORONTO, ONTARIO, CANADA.

LETTER-COPYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 354,794, dated December 21, 1886.

Application filed July 24, 1885. Serial No. 172,531. (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, gentleman, have invented an Improved Letter-Copying Machine, of which the following is a specification.

The invention relates to a letter-copying machine; and it consists in the peculiar combinations and the novel construction and arrangement of parts, as hereinafter more fully described and claimed.

Figure 1 is a perspective view of my improved copying-machine partially in section to exhibit its interior construction. Fig. 2 is a longitudinal section of Fig. 1.

A represents the main or driving roller, provided with a spindle journaled in the frame B.

C is a crank-handle connected to the spindle of the roller A.

D is a wringing-roller journaled in the frame B, as indicated, and having its axis substantially parallel with the axis of the roller A.

The journal-boxes of this roller D are carried in slotted passage-ways made in the frame B, and are adjusted by means of rubber or other elastic packing, *a*, so that its periphery may be readily adjusted to keep in contact with the surface of the roller A.

E is a roller journaled in suitable boxes, *b*, contained in slotted passage-ways made in the frame B, adjusted vertically in the same manner as the roller D is adjusted horizontally so that the surface of the roller E may be held in contact with the surface of the metal roller D. The roller E is covered with cloth or other porous material, so that it will gather moisture from the water contained within the pan F, within which the said roller revolves.

H is what I term the "copying-roller," journaled in suitable boxes, *d*, held in the frame B in the same manner as the axle-boxes of the rollers D and E.

I represents a web of copying-paper extending from the paper-roll J, which is carried on a spindle journaled in the frame B. It will be noticed that the web I, after leaving the paper-roll J, passes over a small roller, K, and then below a similar roller, L. Both the rollers K and L are journaled in an arm, M, which is pivoted at *e* to the frame B, so that

the rollers K and L may have a slight swinging movement in addition to revolving on their axes during the passage of the paper I. The roller K, it will be seen, supports the paper I and prevents it dropping into the water-pan F, while the roller L is located so as to hold the paper I down and cause it to hug the surface of the roller E, which it does from the point that it leaves the roller L till it passes the contact-point of the roller D, from which point it extends around the roller D, between it and the roller A, and thence between the said roller and the copying-roller H. The rollers A, D, E, and H are either geared together or arranged in contact, as indicated in the drawings, so that the revolving of the roller A imparts a corresponding motion to the other rollers. Consequently when the crank-handle C is turned in the direction indicated by arrows the other rollers mentioned will also move, so that their joint action shall cause the web of paper I to pass through them in the direction indicated by arrow, the effect of which will be that the said paper is first thoroughly soaked by being held in contact with the surface of the roller E, partially wrung by passing between the rollers D and E, and then finally wrung entirely free from any surplus moisture by passing between the wringing-roller D and main roller A, so that the said paper shall be in proper condition to receive impressions from the manuscript, which is passed between the copying-roller H and main roller A, with the surface of the manuscript in contact with the paper I. In order to prevent the paper I from winding round the roller A, I provide a roller, N, suitably journaled in the frame B, and having bristles or rubber projections *f*, so as to present a flexible surface for acting against the paper I when the roller N revolves, which it is caused to do at a higher speed than the roller A, from which it is driven by the strap or cord *g*, as indicated.

O is a table on which the sheets of manuscript to be copied may be placed, which sheets, as they pass between the rollers H and A, are copied on the paper I, and are conveyed by the said paper over the roller N, falling with it into a basket placed for the purpose; or they may be gathered by the operator as they pass through.

In practice I have found that the best result is obtained by making one roller in each pair of rollers brought in contact with each other of metal or a hard unyielding material, while its mate is made of yielding or slightly pliable material. With that view I usually make the roller A of nickel-plated metal or some other hard and unyielding material, while I make the rollers D and H of soft rubber or some other yielding material, but of course the same general effect would be produced were the rollers D and H made of hard unyielding material and the roller A made of soft rubber or other yielding material. If the surfaces of two soft rubber rollers are pressed together sufficiently tight to wring or copy a piece of paper carried between them, it will be found that the said paper will be constantly torn by the twisting action of the rubber rollers, whereas by making one roller of a hard unyielding material its mate may be of a soft yielding material without any twisting action being produced; consequently paper carried between a hard and soft roller, as specified, will not be torn.

A feature of great importance in the construction of my machine is the fact that the paper I is made to hug the roller E, so that it will be thoroughly saturated over its entire surface, while by locating the roller D at the point indicated the paper I, though thoroughly soaked, as mentioned, is perfectly wrung, so that it will be nearly damp enough to receive the impression from the manuscript carried between the rollers H and A, as before described.

P is a water-cup connected with the interior of the pan F, so that the said pan may be filled with water through the said cup P, which may be also utilized as a water-gage for indicating the height of water within the pan.

In order to prevent the handle C from being turned in the wrong direction, I place a ratchet-pawl, Q, which permits the roller A to be turned freely in the direction indicated by arrow, but prevents it being reversed.

I do not claim in this application the combination of a main roller, a copying-roller, a damping-roller, a wringing-roller arranged to wring the paper, and a drum bearing a continuous coil of paper passing through the said rollers; nor, in a letter-copying machine, the

combination of a main roller, a copying-roller, a wringing-roller arranged to press upon the paper, and a wetting apparatus, as these combinations are shown and claimed in my Patent No. 333,312, dated December 29, 1885.

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, the damping-roller E, and a hard unyielding roller arranged in combination with a roller made of soft and yielding material for the purpose of wringing the copying-paper before it is brought in contact with the manuscript, substantially as and for the purpose specified.

2. In a letter-copying machine, the combination of the damping-roller E, the hard unyielding roller A, and the soft and yielding rollers D H, revolving in contact with said rollers E A, respectively, substantially as and for the purpose specified.

3. The rollers A, D, and E, the latter being dampened and arranged to act on the paper I, as specified, and the roller D, revolving in contact with both the rollers A E, in combination with the roller L, arranged to make the paper I hug the roller E, substantially as and for the purpose specified.

4. The roller E, revolving in the pan F, in combination with the rollers L and K, journaled in the pivoted arm M, and arranged to act on the paper I, substantially as and for the purpose specified.

5. In a copying-machine in which the manuscript is copied on a continuous web of paper carried between rollers, the combination, with the rollers A D E H, arranged in relation to each other, as specified, of a revolving roller, N, arranged substantially as and for the purpose specified.

6. The dampening-roller E and main roller A, in combination with the wringing-roller D, arranged to hug the surfaces of the rollers E and A, for the purpose of forming a double wringer for the copying-paper I, as and for the purpose specified.

Toronto, July 17, 1885.

J. F. LASH.

In presence of—

A. MACKENZIE,
CHARLES C. BALDWIN.