

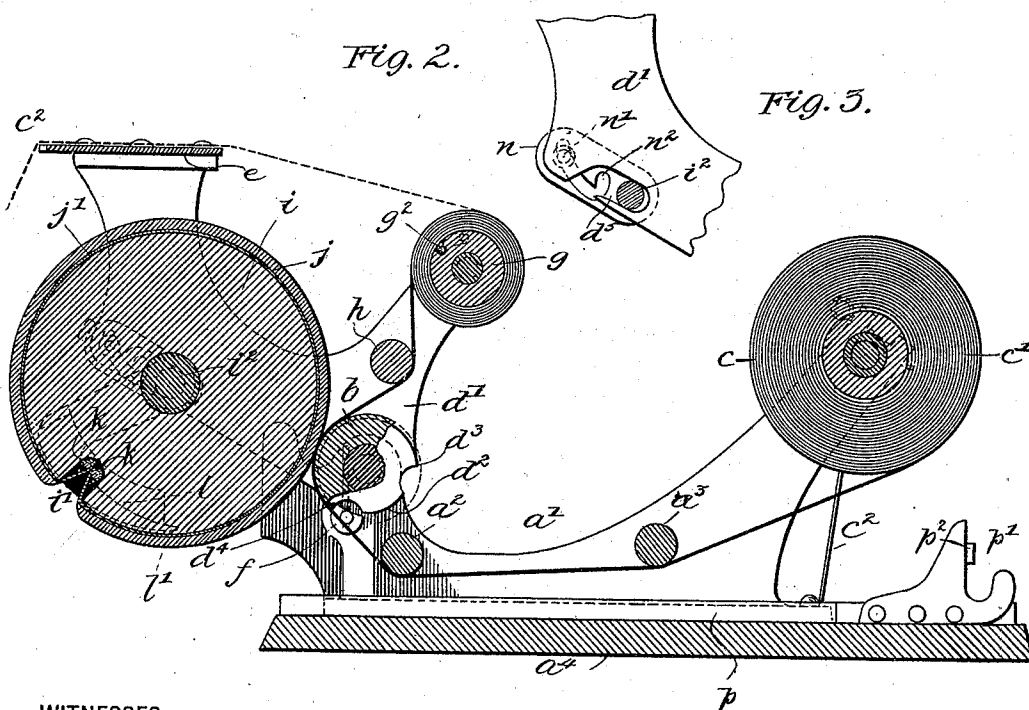
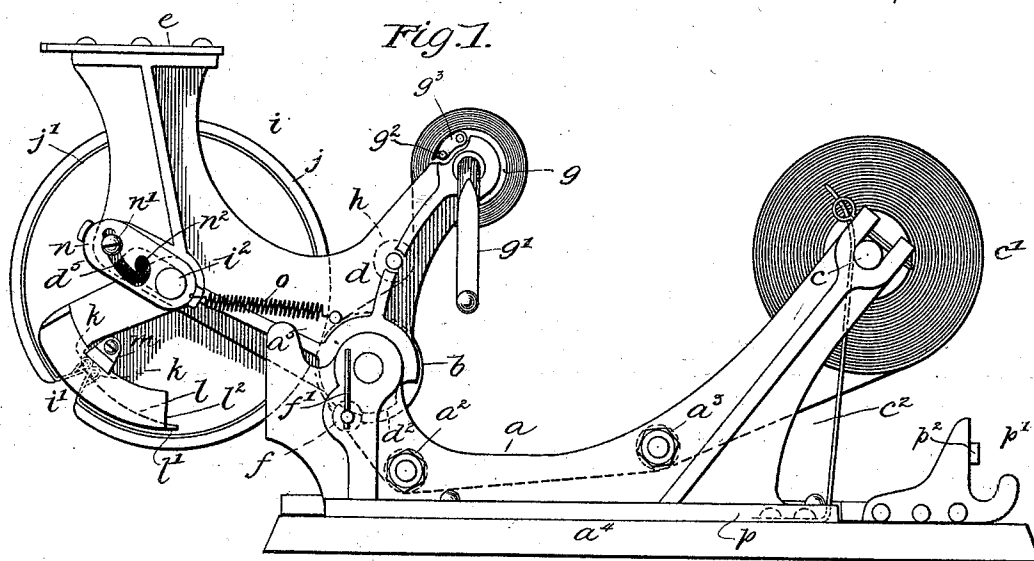
(No Model.)

2 Sheets—Sheet 1.

J. A. BROWNING & T. M. ST. JOHN.
COPYING MACHINE.

No. 554,237.

Patented Feb. 11, 1896.



WITNESSES:

Frank S. Ober
Alfred W. Van Zee

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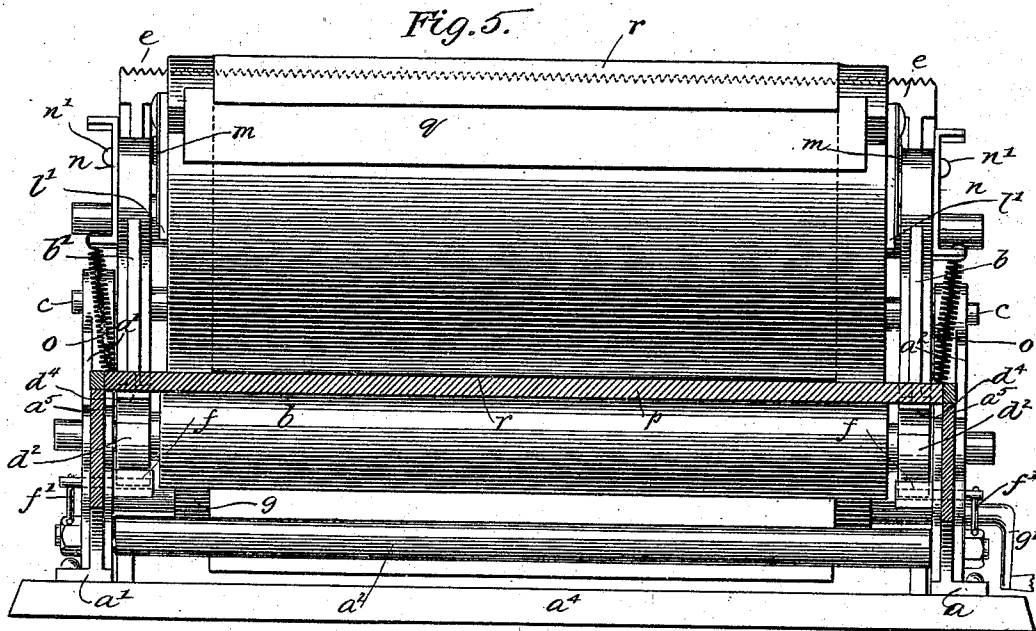
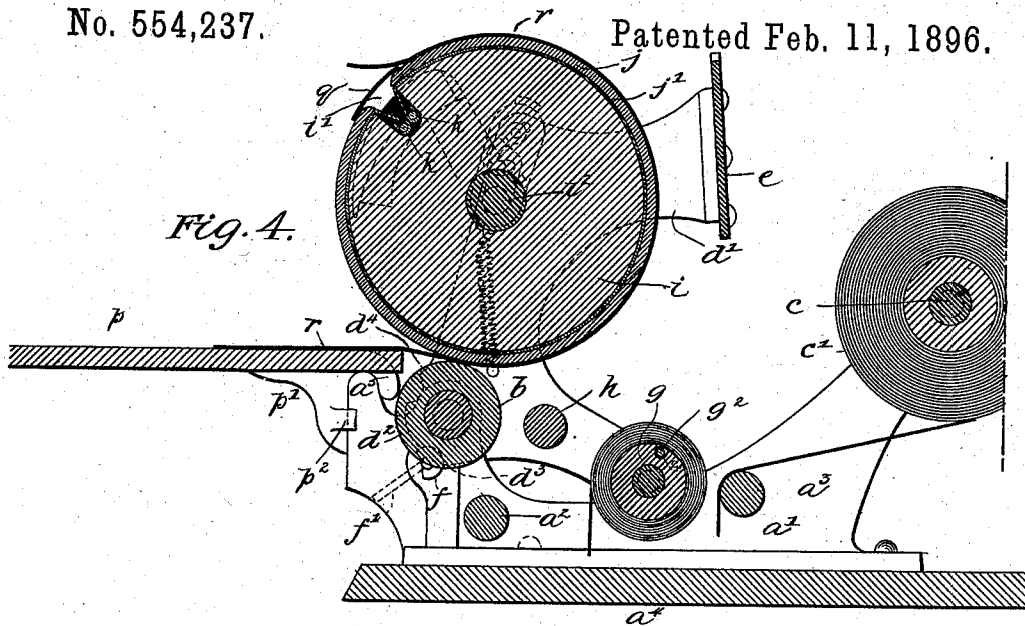
(No Model.)

2 Sheets—Sheet 2.

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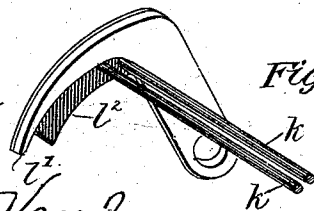


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Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN A. BROWNING AND THOMAS M. ST. JOHN, OF NEW YORK, N. Y.

COPYING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 554,237, dated February 11, 1896.

Application filed October 14, 1893. Serial No. 488,133. (No model.)

To all whom it may concern:

Be it known that we, JOHN A. BROWNING and THOMAS M. ST. JOHN, citizens of the United States, residing in New York city, county and State of New York, have invented certain new and useful Improvements in Copying-Machines, of which the following is a specification.

The object of our invention is to supply a means for the ready production of a number of copies of drawings and written matter by a dry-copying process.

Our invention contemplates making the copies on a continuous strip of paper or on separate sheets of paper, and the machine is designed to be readily adjusted to accomplish these ends.

The construction and operation of the machine will be understood by reference had to the accompanying drawings, forming a part of the specification, in which—

Figure 1 is a side elevation of our improved copying-machine adjusted for printing on a strip of paper. Fig. 2 is a central longitudinal section of the same. Fig. 3 is a view of the absorbent-roller-controlling device detached. Fig. 4 is a longitudinal section of the machine adjusted for printing on separate sheets of paper. Fig. 5 is a front elevation of the same, and Fig. 6 shows one end of the clamping device for holding the absorbent covering on its roller.

The two main side frames a and a' are connected together by the tie-rods a^2 a^3 and are secured to the base a^4 . At the front ends of these frames is journaled the pressure-roller b , and at their rear ends are provided open bearings for the shaft c , which carries the roll of paper c' , and against this shaft springs c^2 bear and act as brakes to prevent racing of the roll of paper when it is being printed upon.

On boxes concentric with the axis of the roller b are fitted the swinging frames d d' , which carry the other rollers of the machine, and the plate e (said plate being securely fastened to the frames by screws) acts as a brace to bind the frames together and also performs the functions of a knife, over the edge of which the strip of paper may be cut into sheets after being printed upon, and this edge may be serrated to facilitate this work.

To lock the swinging frame in its two operative positions, the bolts f f' are fitted to rotate in holes in the side frames a a' , their inner cylindrical portions being cut away, as shown in Fig. 2, to allow the curvilinear parts d^2 d^3 of the frames d d' to pass over them while said frames are being shifted, and they act as stops to determine the two positions of the frames by the outer edges of the recesses d^2 and d^4 coming in contact with them. These recesses are shaped to receive the bolts f f' when they are rotated by their finger-pieces f' f'' to firmly lock the frame. Figs. 5 and 6 show the frames d d' locked in their upper position.

The paper-receiving roller g has bearings in the frames d d' , is provided with a crank-handle g' and with a paper-gripping device consisting of a rod g^2 and end plates g^3 fastened to the ends of the rod and pivoted to the ends of the rollers in such manner as to permit the rod to pass into a longitudinal groove formed in the roller, so as to carry with it the end of the paper and thereby clamp it to the roller.

Between the rollers b and g is located the stripping guide-roller h . This roller h we have found essential to cause the paper to leave the absorbent roller freely, for its adhesiveness is such that the paper is liable to become creased when wound on the roller g directly from the absorbent roller. The absorbent surface of the impression-roller i consists of a gelatinous or other material j suitable to absorb the ink of the drawing or writing to be copied, fixed on a fabric backing j' , and to enable this absorbent surface to be readily applied to and removed from the cylinder the projecting ends of the fabric j' are formed with hems adapted to receive the rods k k , and with the rods therein they are placed in the groove i' formed longitudinally in the roller i , and the fabric is drawn tightly on the roller by means of the cam-shaped catches l l at the ends of the roller i and fitted to rock on the shafts i^2 i^3 . These catches l l , when the covering j j' is being applied, are moved over with their ends l' in line with the groove i' . One end of one of the rods k is placed under the end of one of the catches, so as to project a little beyond the catch. This end of the fabric and rod are then placed in the

groove and slid lengthwise until the other end of the rod passes under the end of the other catch. The covering $j\ j'$ is now wrapped around the roller i , said roller being held away from the pressure-roller b during this operation, as hereinafter described, and the other end of the fabric and its rod are inserted in the groove and under the ends of the catches. The catches are now moved over, their cam or inclined surfaces acting on the ends of the rods $k\ k$ to draw the rods toward the center of the roller, thereby causing the covering to hug the roller closely. To prevent the rods $k\ k$ working out endwise, the catches are provided with the flanges $l^2\ l^2$, and to assist in moving the catches over to draw on the rods $k\ k$ the guide-brackets $m\ m$, fastened on the ends of the rollers i , are provided, said pieces being so shaped as to overlap flanges $l^2\ l^2$ and thus hold the outer parts of the catches against the ends of the roller i . To cause the roller i to bear with a yielding pressure against the pressure-roller b and to hold it away when required the following device is employed at each side of the machine. A plate n is held against the frame by a screw n' and receives the end of the shaft i^2 . Said shaft also plays in the slot d^3 , which has its opening near where the screw n' is located, as clearly shown at Fig. 3. The plate n has a curve-shaped slot which works on the screw n' and which has a re-entrant notch n^2 . The spring o is attached to plate n and the frame and draws the roller i toward the roller b . Now to withdraw and hold the roller i away from the roller b the plates $n\ n$ are moved back until the re-entrant notches $n^2\ n^2$ catch over the screws $n'\ n'$, and when it is desired to entirely remove the roller i for the purpose of replacing it by another of a different size the screws $n'\ n'$ are taken out and the plates $n\ n$ slipped off the ends of the shafts $i^2\ i^2$, which allows the shafts to slide out of the slots $d^3\ d^3$.

To operate from a roll of paper the machine is set as shown at Figs. 1 and 2, the paper c' placed on the shaft c , around the pressure-roller b , the guide-roller h , and clamped to the roller g , upon which it is wound. The roller i , with its absorbent surface carrying the device or matter to be printed, bears against the paper as it passes over the roller b and imprints it as fast as it can be conveniently wound on the roller g . The paper c' is shown as passing under the tie-rods $a^2\ a^2$. This is not necessary. When a small roll is used, it can pass directly to the roller b ; but if as large a roll as can be placed in the machine be used then it may be convenient to pass the paper under the rod a^3 .

After the desired number of impressions have been run off, the paper from the roller g , after being separated from the main roll, is drawn over the knife e , as shown at c^2 , and by means of its edge cut or torn into sheets. In operating with separate sheets, with the swinging frame and its attendant parts set in

the position shown at Figs. 4 and 5, a table p is used, upon which the sheets are placed to be fed to the machine. This table is provided with hooked brackets $p'\ p'$ at one end, which set over the projections $a^5\ a^5$, extending upwardly from the front end of the frames $a\ a'$, said brackets having side lugs $p^2\ p^2$, which rest against the sides of the frames $a\ a'$ to prevent lateral movement of the table thereon. The roller i is prepared for this work by placing a strip of paper or other suitable material q on the absorbent surface extending over the slot i' or where the spaces at the top and bottom of the sheets to be printed will come. Gelatinous material, if used, has sufficient adhesiveness, especially if slightly moistened, to hold this paper q in place. In starting, the roller is set with this piece of paper q adjacent to roller b , the end of the first sheet r to be printed is started between the rollers, and the roller i is turned until this end of the sheet is at top, as shown. The end of paper r is, by reason of the paper-guard q , free and easily grasped by the fingers, which would not be the case if this guard were omitted. The sheet is now pulled, stripped from the roller, and the roller rotated until the guard q again comes in position for the end of the next sheet of paper to be fed against it. Then upon continuing the pull on the first sheet until it is clear of the roller the free end of the next sheet is in position to be grasped by the hand, which is pulled off the roller, as was the first sheet, and another sheet fed, as before, and so on, the work being accomplished as quickly as the sheets can be fed to the roller and pulled off.

The table p is of a width to lie in the bottom of the machine between the frame $a\ a'$ when not in use, and is so shown in Figs. 1 and 2.

We claim as our invention—

1. In a copying-machine the hereinbefore-described organization comprising a main frame, a pressure-roll and a paper-carrying roll journaled therein, a swinging frame, a paper-receiving roll and an absorbent impression-roll mounted in the swinging frame whereby the machine is adapted to make impressions upon a continuous web of paper or single sheets of paper.

2. In a copying-machine the hereinbefore-described organization comprising a main frame, a paper-carrying roll and a pressure-roll journaled therein, a swinging frame, a paper-receiving roll, an absorbent impression-roll and a stripping guide-roller, all mounted in the swinging frame, whereby the machine is adapted to make impressions upon a continuous web or detached sheets of paper.

3. In a copying-machine the hereinbefore-described organization comprising a main frame, a paper-carrying roll and pressure-roll journaled therein, a swinging frame, and a knife, paper-receiving roll, absorbent impression-rolls and a stripping guide-roller all carried by the swinging frame whereby the ma-

chine is adapted to make impressions upon a continuous web of paper that may be severed into sheets by the knife and upon detached sheets of paper.

4. In a copying-machine the hereinbefore-described organization comprising a main frame, a paper-carrying roll and pressure-roll journaled therein, a swinging frame a locking device for securing the swinging frame in either of two operative positions, and a paper-receiving roll and an absorbent impression-roll carried by the swinging frame, whereby the machine is adapted to be adjusted and locked in two positions, in one of which impressions may be made upon a continuous web of paper and in the other of which impressions may be made upon detached sheets of paper.

5. In a copying-machine the hereinbefore-described organization comprising a main frame, a paper-carrying roll and pressure-roll journaled therein, a swinging frame, and a paper-receiving roll and an absorbent impression-roll carried by the swinging frame, and a feed-table adapted to be attached to the main frame, whereby the machine is adapted to make impressions upon a continuous web of paper or upon detached sheets of paper fed to the machine from said table.

6. In a copying-machine the hereinbefore-described organization comprising a main frame, a paper-carrying roll and pressure-roll journaled therein, a swinging frame, a locking device for securing the swinging frame in either of two operative positions, a feed-table adapted to be attached to the main frame, and a paper-receiving roll and absorbent impression-roll carried by the swinging frame, whereby the machine is adapted to be adjusted and locked in either of two positions, in one of which impressions may be made upon a continuous web of paper and in the other of which impressions may be made upon detached sheets of paper fed to the machine from said table.

7. In a copying-machine the hereinbefore-described organization comprising a main frame, a paper-carrying roll and pressure-roll journaled therein, a swinging frame, a paper-receiving roll carried by the swinging frame, an absorbent impression-roll adjustably mounted in the swinging frame, and latch-bearing plates for holding the absorbent roll away from the pressure-roll, all for the purpose described.

8. In a copying-machine the hereinbefore-described organization, comprising a main

frame, a paper-carrying roll and pressure-roll journaled therein, a swinging frame, and a knife, a paper-receiving roll, an absorbent impression-roll and a stripping guide-roller all carried by the swinging frame, and latch-bearing plates for holding the absorbent roll away from the pressure-roll.

9. In a copying-machine the hereinbefore-described organization consisting of a main frame, a paper-carrying roll and a pressure-roll journaled therein, a swinging frame, and a knife, a paper-receiving roll, an absorbent impression-roll, and a stripping guide-roller all carried by the swinging frame, and a feed-table adapted to be attached to the front of the main frame for the purpose described.

10. In a copying-machine the hereinbefore-described organization comprising a main frame, a paper-carrying roll and a pressure-roll journaled therein, a swinging frame, a paper-receiving roll carried thereby, an absorbent impression-roll adjustably mounted therein, latch-bearing plates for holding the absorbent roll away from the pressure-roll, and a locking device for locking the frame in either of two operative positions, for the purpose set forth.

11. In a copying-machine the hereinbefore-described organization comprising a main frame, a paper-carrying roll and a pressure-roll journaled therein, a swinging frame, a locking device for securing the swinging frame in either of two operative positions, a feed-table adapted to be attached to the front of the main frame, a paper-receiving roll and an absorbent impression-roll both carried by the swinging frame, and latch-bearing plates for holding the absorbent roll away from the pressure-roll, for the purposes described.

12. An absorbent facing for copying apparatus, consisting of gelatinous or other absorbent material, applied upon a fibrous backing having hems at its ends, and removable attaching-rods inserted in said hems, in combination with a roll having a longitudinal groove to receive both attaching-rods, catches mounted upon the ends thereof, the cam-face of each of the catches being adapted to slide over the ends of both securing-rods, and draw the backing taut around the roll.

In testimony whereof we have hereunto subscribed our names.

J. A. BROWNING.
T. M. ST. JOHN.

Witnesses:

FRANK S. OBER,
ALFRED W. VAN ZEE.