(No Model.)

3 Sheets—Sheet 1.

E. W. WICKEY.

LETTER COPIER.

No. 455,823.

Patented July 14, 1891.

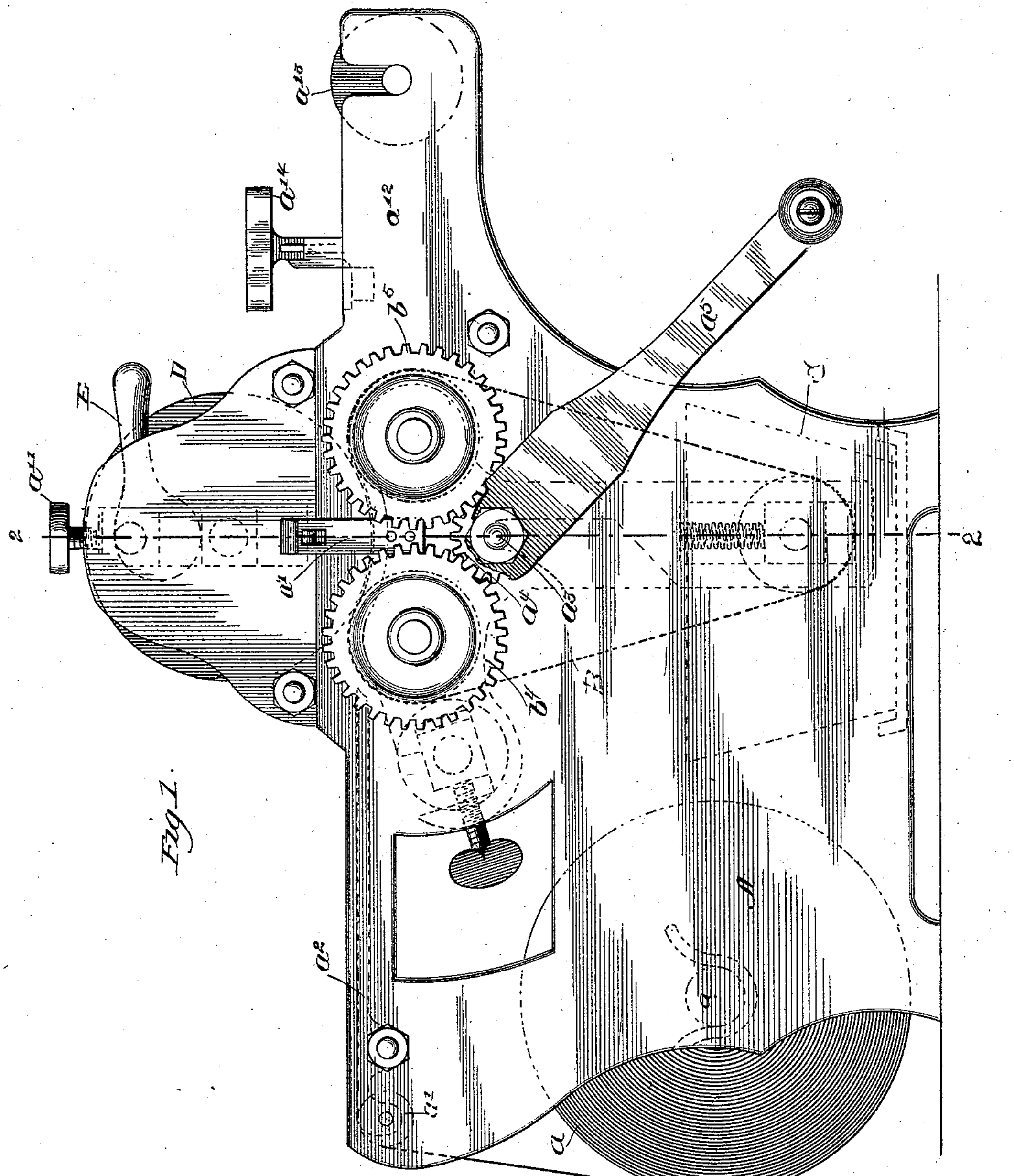


Fig. 1.

Witnesses:

R. H. Perry.

George W. Baker.

Inventor:

Edward W. Wickey,

By Wiles, Greene & Bitner, Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

E. W. WICKEY.

LETTER COPIER.

No. 455,823. Patented July 14, 1891.

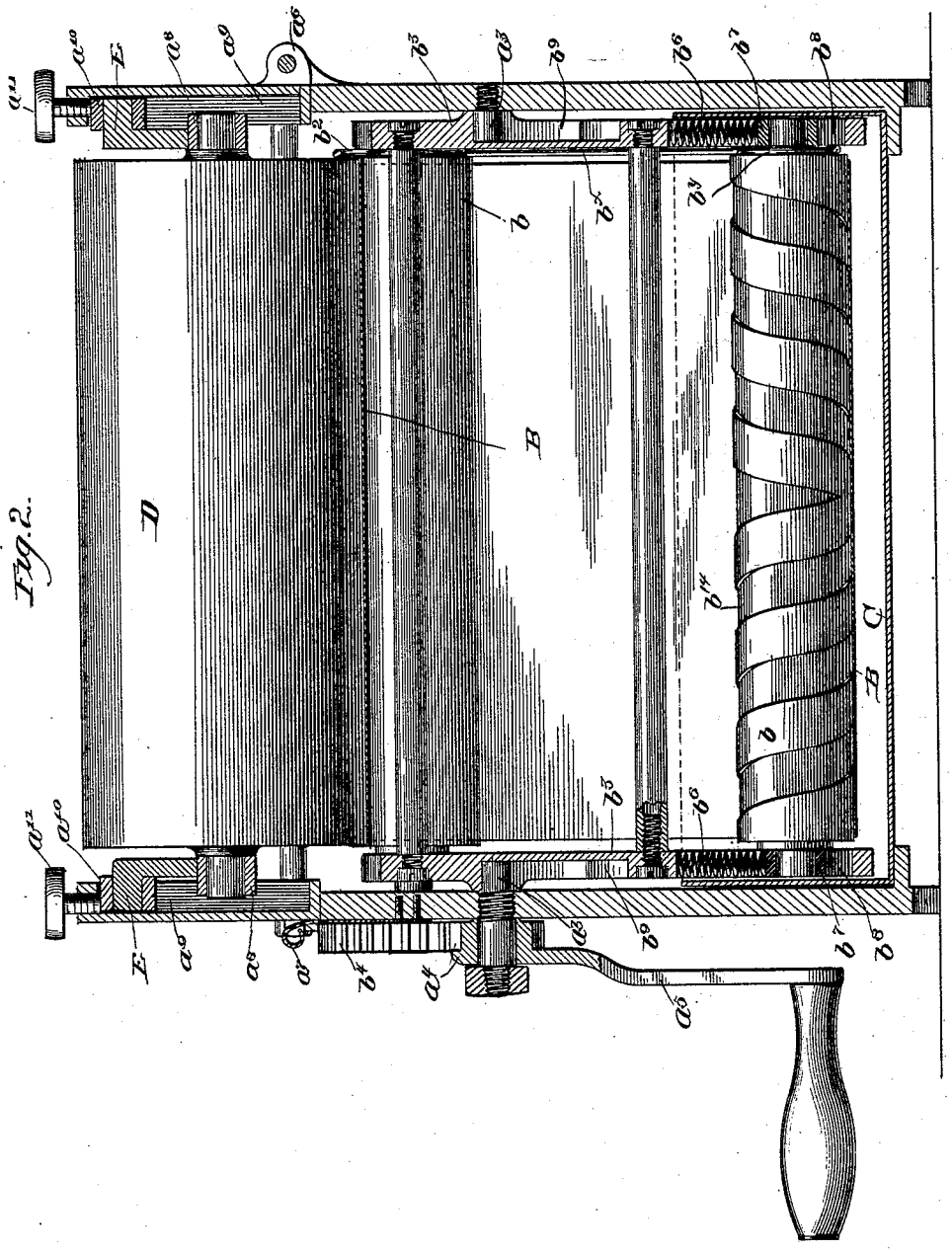


Fig. 2.

Witnesses:
D. H. Drury
George W. Baker

Inventor:
Edward W. Wickey
By Wells Greene & Bitner
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

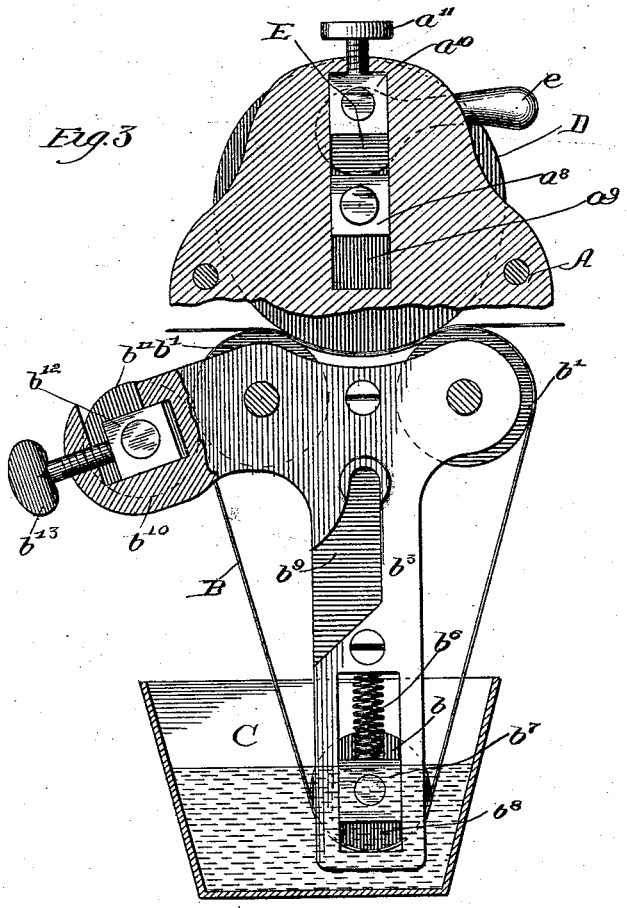
(No Model.) 3 Sheets—Sheet 3.

E. W. WICKEY.

LETTER COPIER.

No. 455,823. Patented July 14, 1891.

Fig. 3



Witnesses:
R. H. Dorry.
George W. Baker.

Inventor:
Edward W. Wickey
By Wiles, Grant & Pitman,
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWARD W. WICKEY, OF CHICAGO, ILLINOIS.

LETTER-COPIER.

SPECIFICATION forming part of Letters Patent No. 455,823, dated July 14, 1891.

Application filed October 3, 1890. Serial No. 366,971. (No model.)

To all whom it may concern:

Be it known that I, EDWARD W. WICKEY, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Letter-Copiers, of which the following is a specification.

My invention relates to a machine for copying letters by passing the same in contact with thin copying-paper between rollers adapted by suitable means to moisten the thin copying-paper, and also to press the same and the letter tightly together, and thereby take a wet copy of the latter.

Said invention consists more particularly in certain improvements in said moistening and pressing devices, which will be clearly set forth and described, and the advantages thereby gained will be stated in a general way below.

The machine in which I prefer to embody my improvements is shown in the drawings presented herewith, wherein—

Figure 1 is a side elevation of the same; Fig. 2, a vertical transverse section in line 2 2 of Fig. 1, and Fig. 3 a detail side view of certain parts hidden by the frame of the machine in Fig. 1.

In letter-copiers of the class to which this machine belongs it has heretofore been customary to copy the letters upon tissue-paper supplied to the machine in the form of a roll mounted therein and passed through the same by the operation thereof, first being carried through a suitable bath in which it is supposed to be properly moistened, then wrung out by suitable wringers, and afterward passed, together with the letter to be copied, between pressure-rollers, and delivered from the latter beneath a suitable knife or cutter, by means of which the portion of the tissue-paper which bears the copy of the letter may be detached.

In constructing these machines great difficulty has been encountered first in the construction of a suitable pressing device that will give a convenient, easily-adjustable, and perfectly even pressure upon the letter and the tissue-paper in contact therewith. Furthermore, it will be noticed from the above general description that there is more or less necessary waste of paper because the paper itself is passed through the moistening-bath, thence through a wringing device, and finally to the pressing-rollers, where it meets the letter to be copied. Now it is apparent that when these machines are not used for a short time all that portion of the paper between the bath and the pressure-roller will become dry, and when it is again necessary to use the machine such paper must be run through before the letter is inserted, and thrown away in order to bring the moist tissue-paper suitable for copying to the pressure-rollers. Again, it is necessary, to insure a clear copy, to pass the letter through the machine rather slowly, which gives time for the tissue-paper to dry out more or less during the copying, which of course is a serious detriment and renders it impossible to take a perfect copy from an old letter in which the ink has had time to dry. It is my purpose to remove all these difficulties, and in addition thereto to produce a machine that shall be more simple, durable, and more easily put together or taken apart and handled than any that have heretofore been constructed.

Describing the preferred form of said machine from the drawings, by means of reference-letters applied to the various parts thereof, the same letters in the different figures indicating like parts, A is the frame of the machine, carrying at a a roll of copying-paper, which passes up over a roller a' to the table a^2, upon which the letters are laid, and thence to the moistening and pressing devices. The former consists in its general form of a roller provided with means for pressing the copying-paper firmly and evenly upon its surface and having said surface covered with a suitable absorbing material passed at some point through a moistening device adapted to give to said material such an amount of moisture as may be necessary to produce the desired copy. I prefer, however, to construct this moistening device as shown in the drawings, and it consists therein of a belt or ribbon B, passing over rollers $b\ b'\ b^2$, all journaled in a frame b^3, swinging inside of the frame of the machine upon pins a^3, supported by the latter. The shafts upon which the rollers $b'\ b^2$ are mounted pass at one end through the frame of the machine and outside thereof carry the gears $b^4\ b^5$ of equal size. In position to mesh

with these gears, a gear a^4, turned by a handle a^5, is mounted upon a pin supported by the frame of the machine, preferably one of the pins a^3, extended through said frame. The roller b, carried by the depending portion of the frame b^3, is immersed in a vessel C containing water and is preferably mounted in the frame, so as to be vertically movable therein against a slight downward pressure, which may be its own gravity, or, in addition thereto, a light spring b^6, as shown in the drawings. Said roller is here seen as journaled in a square block b^7, sliding up and down in a slot b^8 in the frame b^3, and is geared to the roller b' at the right in Fig. 2 by a belt b^x, running over pulleys b^4 b^z, rigid with the rollers b b', of which the latter b^z is a trifle larger than the former b^4. The frame b^3 is shown as carried upon the pins a^3 by means of a groove b^9, which enables it to be easily placed in position or lifted therefrom.

The frame of the machine upon the side where the gears b^4 b^5 are located is cut away at a^4 a^5 to allow the shafts which carry said gears to be placed in position and to give the shafts plenty of room when the frame b^3 swings upon the pins a^3. The frame b^3 carries at the left a projecting arm b^{10}, in which the roller b^{11} is journaled by means of a block b^{12}, adjustable in said arm to or from the roller b' by means of a thumb-screw b^{13}. The roller b bears around its surface spiral grooves b^{14}, running in both directions from the middle of said roller to its ends and arranged to travel in said directions when the machine is operated.

Above the rollers b' b^2, and in position to press downward between the same, a roller D is mounted in the upper portion of the frame of the machine, which portion of the frame is preferably hinged to the main portion at one side, as shown at a^6, and connected at the other side by a suitable latch or locking device a^7, so that by releasing the latter this portion of the frame, together with the roller D, may be swung upward clear from the rollers beneath it and the swinging frame which carries them, to enable the latter to be lifted out of the machine.

The roller D is shown as journaled in a square block a^8, sliding up and down in a groove a^9 in the frame A and pressed downward by means of a cam or eccentric E, provided with a handle e and itself pivoted to a square block a^{10}, sliding in the groove a^9 and adjustable up or down by means of the thumb-screw a^{11}, carried in the frame of the machine. Extending to the right in Fig. 1 is seen the bed a^{12}, upon which the copies are delivered, and which carries a roller a^{13} to aid in the passage of the same. A cutter a^{14} is also shown as mounted thereon to sever the portion of the copying-paper upon which the copy is made from the continuous strip.

In operating this machine the handle a^5 is turned backward. This is in itself an important improvement, because these machines are necessarily located at some convenient position in an office where they are seen by every one who comes in, and, being something of a novelty to those who have long been accustomed to the use of the ordinary letter-press, nearly every one upon seeing them is struck with a desire to witness their operation, and invariably commences turning the handle a^5 in the direction in which such handles are usually turned. If, as is customary, this is the proper direction to operate the machine, a greater or less amount of copying-paper is passed through the latter and wasted. By arranging said handle as shown, however, such persons will merely turn the machine backward, neither doing any harm thereto nor causing any waste of material. Turning said handle in the proper direction, the belt B is carried downward from the roller b^2 in Fig. 1 to the roller b, where it becomes thoroughly wet by the water in the vessel C, and thence up to the roller b', where it is wrung out to the proper degree of moisture by the adjustable roller b^{11}, after which it meets the copying-paper and the letter thereon, and all three are carried together between the rollers b' b^2 and the roller D, the belt giving up a portion of its moisture to the copying-paper in contact therewith, and the letter being firmly pressed down upon said paper by the roller D, so as to make a perfect copy thereon. The pressure of this roller D is adjusted by the thumb-screws a^{11}, and may be quickly applied or relieved by means of the cam-lever E. The belt B is continuously in contact with the copying-paper from the moment the latter passes between the rollers b' D until it emerges from between the rollers D b^2. This, while preferable, is not absolutely necessary, as the belt B might pass merely around the roller b' and from there down to the roller b; but if it were thus arranged it would moisten the copying-paper much less thoroughly and effectually. The pressure of the roller D upon the rollers b' b^2 is equalized by the frame b^3, which is pivoted at a point substantially equidistant from the axes of the rollers b' b^2, and thus obviates the necessity of any independent adjustment for the latter rollers. It is not absolutely necessary that the roller b should be mounted in the pivoted frame b^3, as the said roller might be journaled directly in the frame of the machine, the mounting of the two rollers b' b^2 in a balanced frame being sufficient to equalize the pressure of the roller D thereon; but it is preferable to have all three rollers journaled in the same frame, as they can then be all removed by lifting such frame out of the frame of the machine. The belt B, as it passes about the roller b, is kept well stretched laterally by the spiral grooves about the latter, which is rotated by the belt b^x, so as to revolve more rapidly than the belt B passes over its surface, which causes the spiral grooves to tend to draw the belt B both ways from the middle.

In the machine above described the moist-

ening and pressing devices are combined. This is not, however, absolutely necessary, and I do not limit my different improvements to a combination with any specific devices, except as definitely pointed out in the claims appended hereto. Said improvements may be used either together or separately in connection with any appropriate supplementary devices.

I claim as new and desire to secure by Letters Patent—

1. In a copying-machine, a paper-moistening device consisting of a belt of absorbent material passed about three rollers, one of which is immersed in a suitable bath and the other two removed therefrom and mounted upon a frame pivoted in the frame of the machine at a point substantially equidistant from the axes of said two rollers, and a device adapted to press the paper upon both of said two rollers.

2. In a copying-machine, a paper-moistening device consisting of a belt of absorbent material passing about three rollers, one of which is immersed in a suitable bath and the other two removed therefrom and mounted upon a frame pivoted to the frame of the machine at a point substantially equidistant from the axes of said two rollers, and a pressure-roller mounted in the frame of the machine and adapted to bear upon both of said two rollers, substantially as described.

3. In a copying-machine, a paper-moistening device comprising a belt of absorbent material carried by a moistening-roller immersed in a suitable bath and two pressure-rollers removed therefrom, all of said rollers being mounted in a swinging frame pivoted to the frame of the machine at a point substantially equidistant from said pressure-rollers, and a third pressure-roller mounted in the frame of the machine with its surface bearing upon said two pressure-rollers, substantially as described.

4. In a paper-moistening device for letter-copiers, the combination of the belt B, carried by the three rollers b b' b^2, mounted in the pivoted frame b^3, the wringing-roller b^{11}, adjustably mounted in the said frame, and the roller D, mounted in the frame of the machine, where it bears upon the rollers b' b^2 and provided with means for adjusting its pressure thereon, substantially as described.

5. In a paper-moistening device for letter-copiers, a belt of absorbing material carried by rollers, one of which is provided with means for pressing the copying-paper evenly thereon and the other has upon its surface spiral grooves b^{14}, traveling from an intermediate point in both directions to its ends, substantially as described.

6. In combination with the frame of the machine, the roller D, mounted in said frame, the pivoted frame b^3, carrying the rollers b' b^2, and the spirally-grooved roller b, the belt B, and the wringing-roller b^{11}, also mounted in said pivoted frame and provided with means for adjusting its pressure, substantially as described.

7. The combination of the frame of the machine, the roller D, mounted therein, the swinging frame b^3, pivoted to the frame of the machine, the rollers b^2 b' b, carried by said swinging frame, the latter having the spiral grooves b^{14} and being journaled in the block b^7, sliding up and down in the slot b^8, the belt B, and the roller b^{11}, provided with means for adjusting its pressure, substantially as described.

8. The combination of the frame of the machine, the roller D, mounted therein, the swinging frame b^3, pivoted to the frame of the machine, the rollers b^2 b' b, carried by said swinging frame, the latter having the spiral grooves b^{14} and being journaled in the block b^7, sliding up and down in the slot b^8, the belt B, and the roller b^{11}, mounted in sliding blocks b^{12}, adjustable by means of the screws b^{13}, substantially as described.

9. The combination of the frame of the machine, the roller D, mounted therein, the swinging frame b^3, pivoted to the frame of the machine, the rollers b^2 b' b, carried by said swinging frame, the latter being mounted in the blocks b^7, sliding up and down in the slots b^8 under a downward pressure from the spring b^6, the belt B, and the roller b^{11}, provided with means of adjusting its pressure, substantially as described.

10. The combination of the frame A, the swinging frame b^3, carrying rollers mounted therein, and a roller D, adapted to press upon the latter and journaled in an independent frame hinged to the main body of the machine at one side and secured at the other by a latch, substantially as described.

11. In a moistening device in a letter-copier, a belt B, passing over two rollers, one provided with means for pressing the copying-paper evenly upon said belt and the other spirally grooved in both directions from the middle portion and geared to a speed greater than that of the belt, substantially as described.

12. In a moistening device in a letter-copier, a belt B, passing over the rollers b b' b^2, the former bearing the grooves b^{14} and being geared to the roller b' by means of the pulleys b^4 b^z and the belt b^x, substantially as described.

13. In a letter-copier, a moistening device containing a swinging frame b^3, carrying a wringing-roller b^{11}, a belt B, stretched upon the rollers b b' b^2, the former bearing the grooves b^{14} and being geared to the roller b' by means of the pulleys b^4 b^z and the belt b^x, substantially as described.

EDWARD W. WICKEY.

Witnesses:
H. BITNER,
CHARLES SHEEVEY.