

(No Model.)

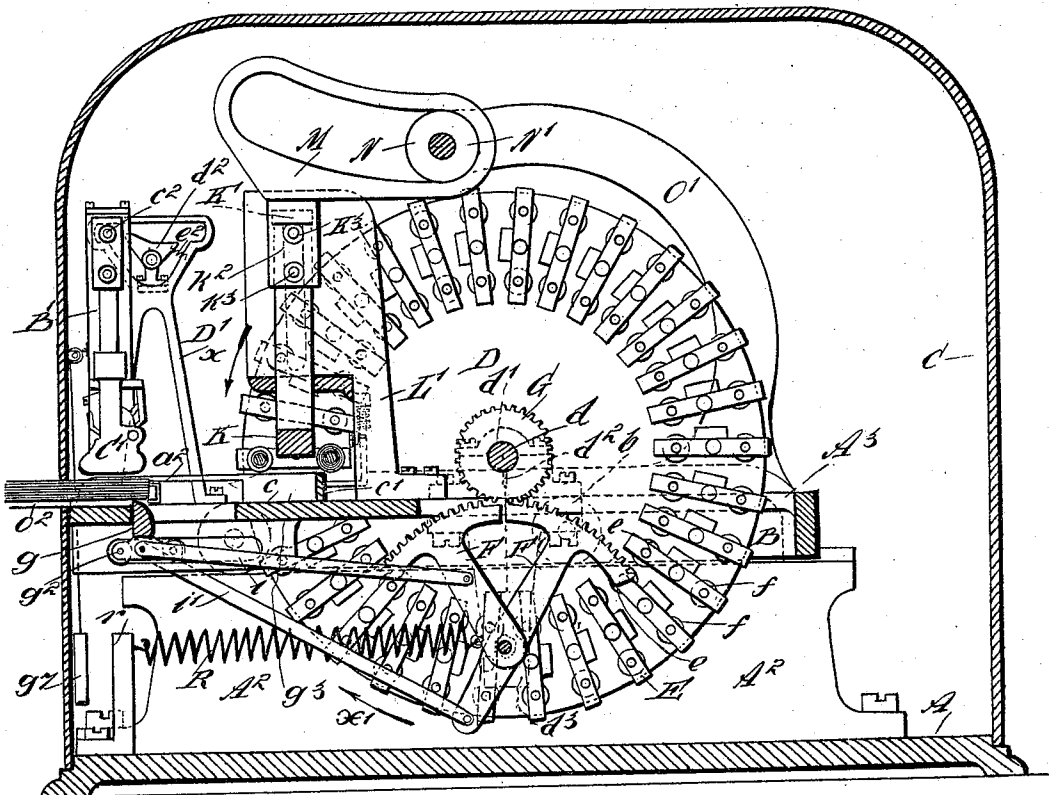
5 Sheets—Sheet 1.

J. FRYDMANE.
COPYING MACHINE.

No. 582,501.

Patented May 11, 1897.

Fig. 1.



WITNESSES.

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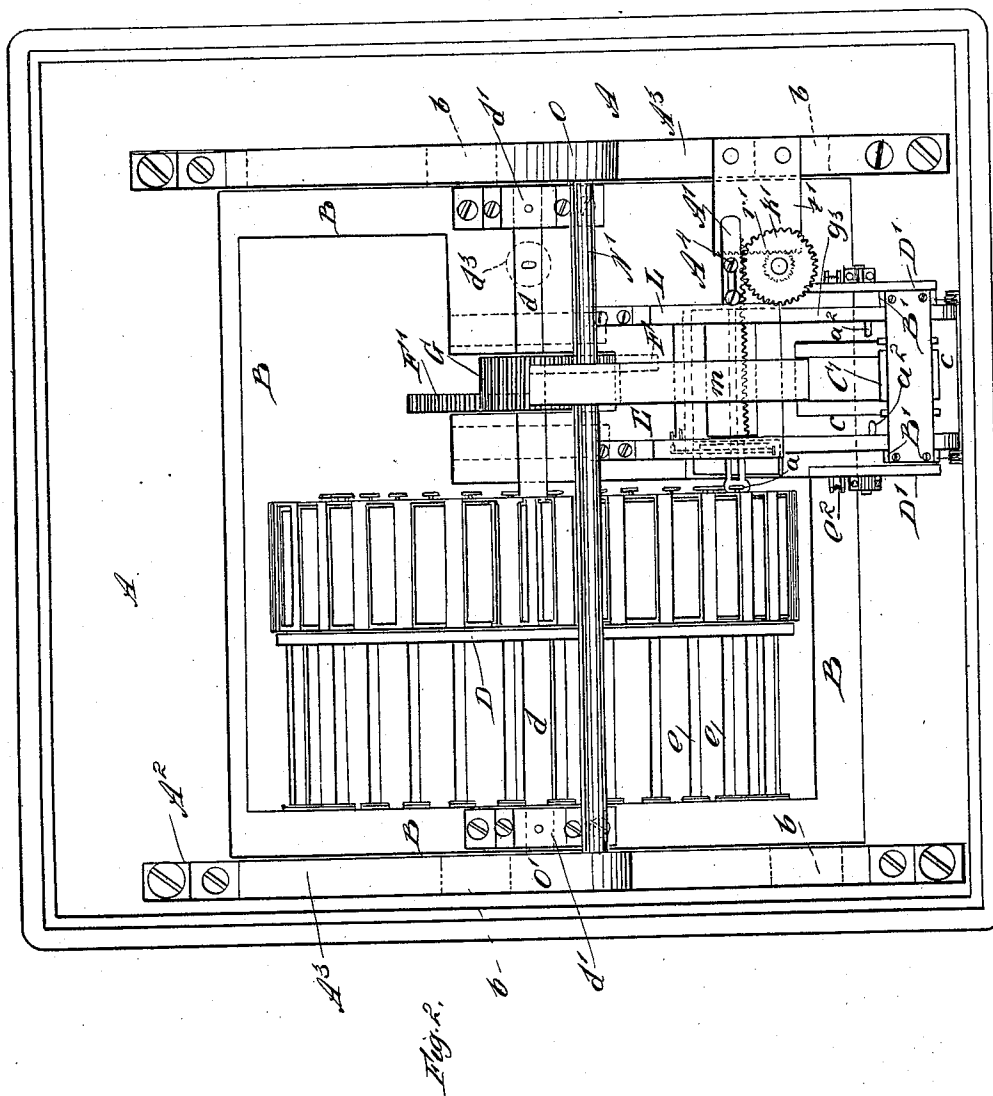
(No Model.)

5 Sheets—Sheet 2.

J. FRYDMANE.
COPYING MACHINE.

No. 582,501.

Patented May 11, 1897.



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J. FRYDMANE.
COPYING MACHINE.

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Fig. 3.

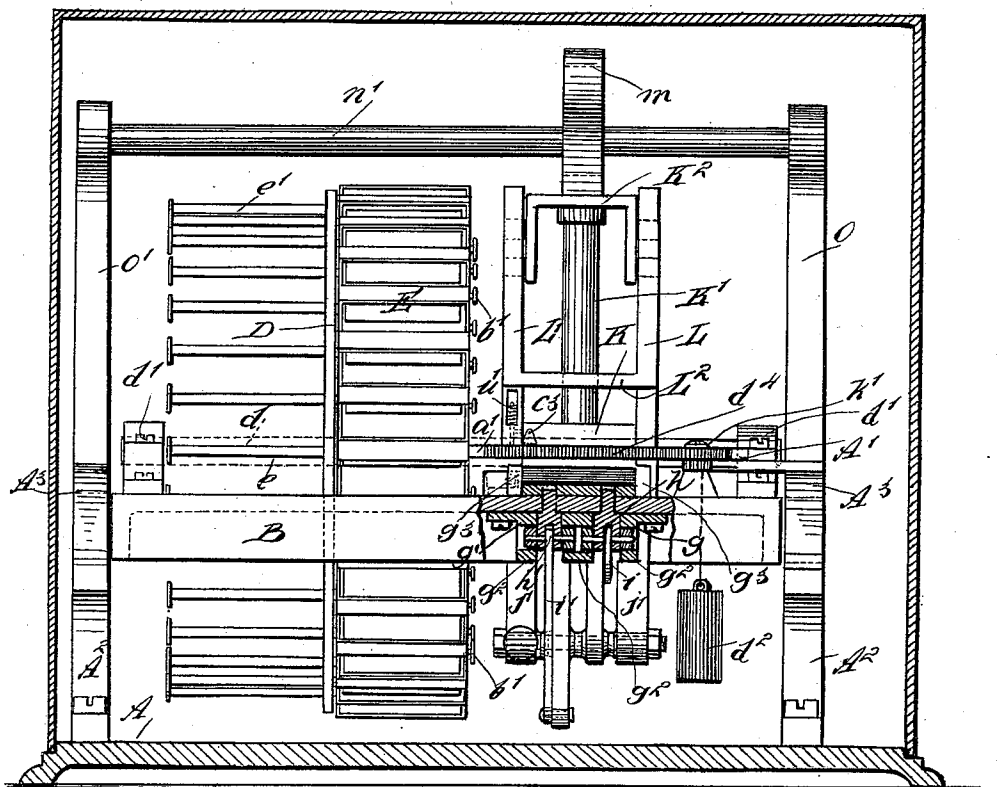
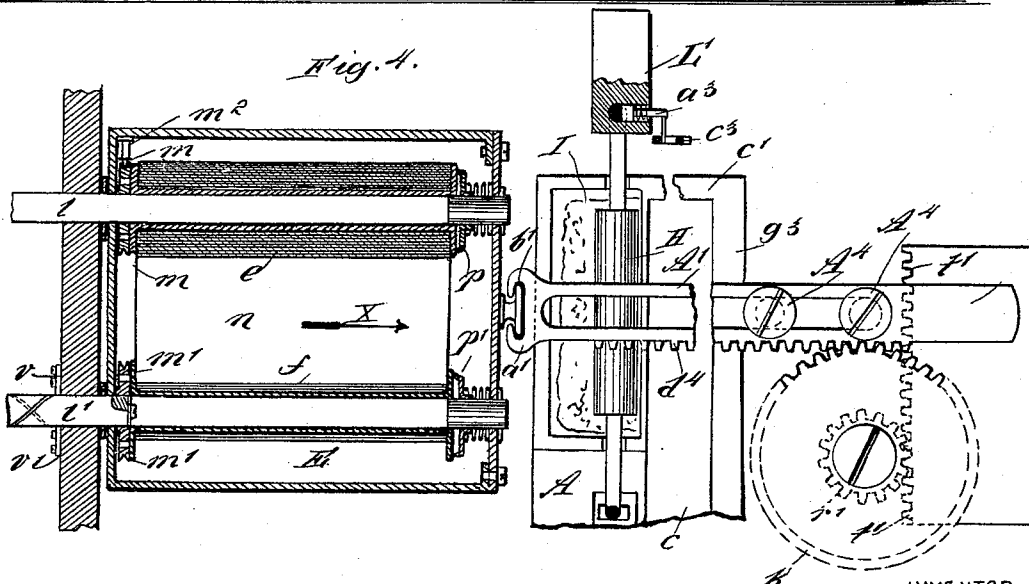


Fig. 4.



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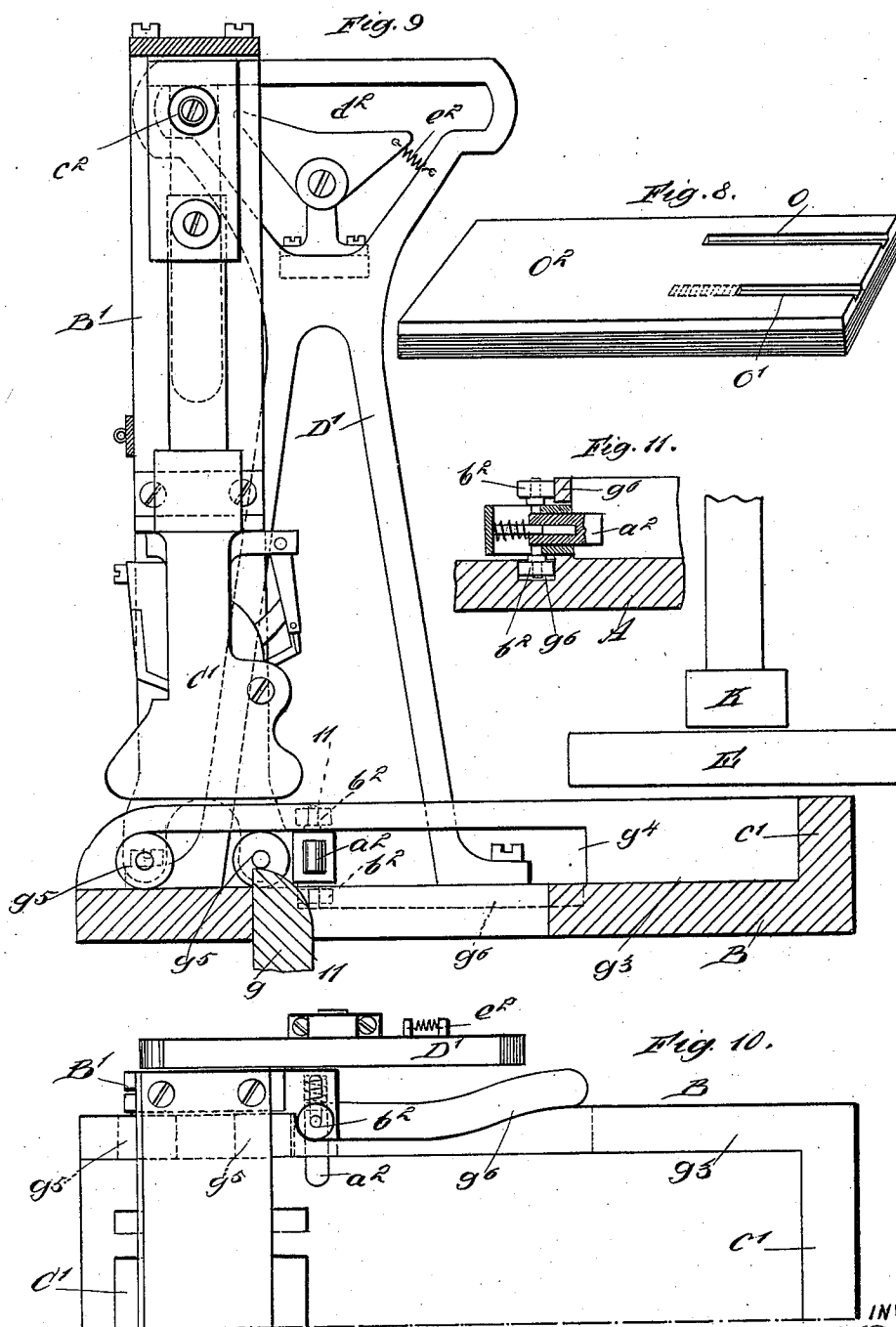
(No Model.)

5 Sheets—Sheet 5.

J. FRYDMANE.
COPYING MACHINE.

No. 582,501.

Patented May 11, 1897.



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UNITED STATES PATENT OFFICE.

JULES FRYDMANE, OF PARIS, FRANCE.

COPYING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 582,501, dated May 11, 1897.

Application filed September 10, 1896. Serial No. 605,413. (No model.)

To all whom it may concern:

Be it known that I, JULES FRYDMANE, merchant, a citizen of the Republic of France, residing at Paris, France, have invented a Copying-Machine, of which the following is a specification.

The object of this invention is to provide a copying-machine having a plurality of independent divisions which may be referred to when desired and impressed with a copy of any writing. In attaining this end I provide a revolvably-mounted disk carrying a number of copying-sheets. The disk coacts with a stamp and a moistener, whereby the copying is effected. The machine is operated by the insertion of the writing to be copied. I have also devised a numbering attachment for the machine.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical section of my invention. Fig. 2 is a plan view thereof. Fig. 3 is a transverse section looking rearward from the line 3 3 of Fig. 2. Fig. 4 is a fragmentary horizontal section on the line 4 4 of Fig. 3. Fig. 5 is a vertical sectional view illustrating the dampening device. Fig. 6 is a plan view of the same mechanism. Fig. 7 is a transverse section of the same mechanism. Fig. 8 is a perspective view of the key-plate which I employ. Fig. 9 is a sectional view showing in side elevation the numbering-machine and the operating means therefor. Fig. 10 is a fragmentary plan view of the same mechanism. Fig. 11 is a detail section on the line 11 11 of Fig. 9.

In the form of the invention shown in the drawings the operative parts rest on a base-plate A, provided with a rabbet-groove around its edge to receive the lower edge of a cover C. Fixed to the upper side of the plate A and running longitudinally are two parallel frame-plates A². Each frame-plate A² has its upper side provided with a guide-rail A³, between which and the upper edges of the frame-plates the rollers *b* of the carriage B run. The carriage B therefore has reciprocal movement backward and forward within the cover C. A retractile spring R is secured to the carriage and to a post *r* in the base, whereby

the carriage B is normally held in the position shown in Fig. 1.

Bearings *d'* on the carriage B carry a transverse rotary shaft *d*, whereon is fixed a disk D, located within the carriage B, such carriage being approximately square, as shown in Fig. 2. Brackets *j'* depend from the carriage B and carry a transverse shaft *j*, to which are fixed sectors F and F'. The sector F' has an arm projecting below the shaft *j* and connected with a forwardly-extending link *i'*, in turn pivoted to a slide *h'*. The sector F is connected with a link *i* at a point above the shaft *j*. The link *i* extends forwardly and is pivoted to a slide *h*, similar to the slide *h'*.

The sectors F and F' mesh with a broad-faced pinion G, fixed to the shaft *d*. An arm *d*² is fixed rigidly to the shaft *d* and projects radially therefrom. From this arm a weight *d*³ is suspended. The weight *d*³, acting through the medium of the flexible connection and the arm *d*², holds the shaft *d*, and consequently the disk D, in the position shown in Figs. 1, 2, and 3.

By the operation of the sectors F and F' the shaft *d* and its disk D may be adjusted to any position. The frame B has in the locality of the slides *h* and *h'* a horizontal plate or web, wherein are formed two longitudinal slots respectively receiving the projections *g* and *g'* of the slides *h* and *h'*. Three longitudinal guides *g*² are secured to the under side of the web of the frame B and form two guideways, between which the slides *h* and *h'* move. The slides have rollers running in the guideways, as shown in Figs. 1 and 3. The web or plate of the frame B is provided with two upwardly-extending flanges *g*³, running longitudinally on the frame and forming a runway *c*. A flange *c'*, running transversely between the rear ends of the flanges *g*³, forms the rear end of this runway. The projections *g* and *g'* extend into the runway *c*.

A key-plate *o*² (for which see Figs. 1 and 8) is adapted to be projected through an opening *a* in the cover C and to run through the runway *c*. The key-plate *o*² has two longitudinally-extending and parallel grooves *o* and *o'* in its under face. These grooves respectively receive the projections *g* and *g'* and are adapted to permit the key-plate to

pass over the projections, without moving them, until the projections engage with the forward extremities of the slots, whereupon the projections g and g' and their respective slides will be forced to move longitudinally in the carriage B and transmit to the sectors F and F' such movement as will shift the disk D. The grooves o and o' are each arranged in the key-plate o^2 , so that in no key-plate will more than one of the grooves be active. This means that the slides h and h' are never operated simultaneously. The connection of the links i and i' with sectors F and F' is such that one sector moves the disk rightward and another moves the disk leftward. Each key-plate accordingly has such an adjustment of its grooves that for a given key-plate a given position of the disk corresponds. The key-plates carry the blocks of paper, whereon should be the writing to be copied.

The disk D carries a great plurality of frames E, transversely slidable with reference to the disk and each carrying a copying-sheet. For each copying-sheet there is a corresponding key-plate. The frames E are each rectangular and arranged with a radial edge-wise disposition on the disk D. Each frame has two shafts l and l' , revolvably mounted thereon. The shafts l and l' are slidable in the disk D. On the shaft l of each frame E is fixed a disk m . A spring m^2 bears against each disk m and tends to retard the rotation thereof. A spool e is loose on the shaft l and is pressed against the disk m thereof by an expansive spring bearing against a toothed disk p , engaging the outer end of the spool e . Wound over the spool e of each frame E is a web n of copying material. The web n is also wound over a spool f on the shaft l' . The shaft l' is provided with a disk m' , having a pawl and ratchet, by which the disk m' is mounted on the shaft l' to turn freely in one direction only. The spool f is loose on the shaft l' . An expansive spring and toothed disk p' are located at the outer end of the spool f and serve to press the spool against the disk m' .

Formed in the shaft l' are two spiral grooves, each of a single convolution and respectively receiving the projections v and v' of the disk D. When the shafts l and l' are drawn transversely through the disk D, the spiral slots and the projections v and v' will cause the shaft l' to perform a single revolution. After the grooves in the shafts l' are given one convolution they are continued straight to the ends of their respective shafts, so that after the shafts are turned once the effect of the projections v and v' will be nil.

The disposition of the pawl and ratchet for the disk m' is such that when the shafts l' are drawn outward their rotation will cause the web n to be fed from the spool e to the spool f . Upon the return of the frame E and the consequent movement of the shafts l and l' the rotation of the shaft l' will be ineffective with reference to the spool f .

The frames E are normally carried at and closely engaged with the left-hand side of the disk D. When a particular sheet of copying-paper is to be impressed with a writing, the particular frame E is drawn out of the runway c . To effect this operation, I provide a transversely-sliding bar A', through which runs a longitudinal groove-receiving stationary pin A⁴, by which the bar A' is guided. The right-hand end of the bar A' has a grip a' , receiving a projection b' on each frame E. A rack t' is fixed to the left-hand guide-rail A³ and meshes with a pinion r' , fixed on an axis, carrying also a spur-gear k' . The gear k' meshes with a rack d' , formed on the bar A'. As the frame B slides, the gears r' and k' will turn in unison, resulting in a leftward sliding of the bar A' and in a consequent leftward movement of that frame E which the previous adjustment of the disk by the insertion of the plate o^2 has brought opposite the bar A'. It is next necessary to press the copying-web upon the writing to be recorded. The key-plates o^2 when projected into the casing C run into the runway c , and when the rear or inward end of the particular plate o^2 is engaged with the flange c' the rearward movement of the carriage B will begin, the plate o^2 staying in the runway c .

Two standard-plates L and L' arise from the web or plate forming a portion of the carriage B, as described hereinbefore. The standard-plates L and L' each have a forwardly-overhanging upper portion, the lower edges of which are connected by a horizontal plate L², through which the stem of a vertically-moving stamp K reciprocates. The upper end of the stem of the stamp K is provided with a longitudinally-disposed plate M, wherein is formed a groove inclined upwardly from the rear extremity of the plate and receiving an anti-frictional roller N, carried on a transverse shaft N', the ends of which are in turn held by arms O and O', respectively, arising from the rear extremities of the guide-rails A³ and bending forwardly to overhang the disk D.

A cross-head K² is held on the stem of the stamp K and in engagement with the lower portion of the plate M by means of a collar K', fixed to the stem. Antifriction-rollers K³ (for which see Fig. 1) are fixed to the respective sides of the cross-head K² and run in vertical grooves in the standard-plates L and L'. It is thus that the stamp K is allowed vertical movement to impress the webs n , and when the carriage slides rearward the action of the roller N within the groove of the plate M will depress the stamp and cause it to operate.

From this description it may be seen that when the key-plates have moved independently of the carriage B as far rearward as possible the two will move rearward in unison. At this moment the descent of the stamp K is initiated and immediately subsequent the impression is effected. To make this operation possible, the parts are so ad-

justed that when the key-plates can move no farther rearward independently of the carriage B the paper which will be hereinafter described as held on the key-plates will be located directly beneath the stamp K and beneath that frame E which may have been drawn out by hereinbefore-described mechanism.

For the copying-presses the provision of dampening apparatus is essential. In attaining this I provide the right-hand side edge of a web or plate on the carriage B with a pocket open at the upper side and containing a sponge I. (For which part see Figs. 4, 5, and 7.) Within this pocket is located a roller H, the axis of which is longitudinal with the carriage B and the trunnions of which are slidable in a rectangular frame H'. Expansive springs s' , carried on the frame H', respectively, upwardly press the trunnions of the roller H. The frame H' is located directly forward of and in longitudinal alinement with the standard-plate L'. The rear side bar of the frame H' is movable in a vertical passage formed in the standard-plate L', as shown in Figs. 5, 6, and 7. A spring u' tends to press the frame H' upward. The rear bar of the frame H' has a notch H², normally receiving a transversely-movable catch a^3 , spring-pressed toward the frame H' and connected with a toothed sector c^3 , adapted in turn to be actuated by racks b^3 , formed one on each frame E and visible in Figs. 5 and 6.

The catch a^3 serves to hold downward the frame H' against the tendency of the spring u' . When, however, the lateral movement of a frame E begins, the rack b^3 thereof will trip the catch a^3 , allowing the spring u' to press the frame H' upward, as shown by dotted lines in Fig. 7. The frame carries with it the roller H, while the springs s' thereof permits this roller to assume such an inclination as will be in conformity with the inclination of the web n in the frame which has been drawn out.

The web between the spools e and f on the outwardly-moved frame will now be moistened by contact with the roller H. This moistening takes place immediately before the rearward movement of the carriage, and consequently before the descent of the stamp K, but immediately after the moistening is effected the stamp K will descend and the operation of copying the writing will now be effected.

It remains for me to describe the numbering attachment and the means for operating the same.

The flanges g^3 are each formed at their forward portions with longitudinally-running slots forming guideways whereon are movable rollers g^5 , respectively carried from the two sides of the vertically-elongated numbering-machine frame B'. This frame is adapted to be moved on and independently of the carriage B and longitudinally thereon. Such operation is effected by the key-plates o^2 , en-

gaging at their forward ends with inwardly-extending lugs a^2 . These lugs are spring-pressed inward. Each lug carries two rollers b^2 , arranged on vertically-extending and longitudinally-alined axes and respectively running in guides g^6 , formed in the flanges g^3 at points above and below the lugs a^2 . The guides g^6 are inclined outward from their front ends. Consequently when a key-plate o^2 is run through the runway c the numbering-machine frame B' will be moved rearward independently of the carriage B until the rollers b^2 , moving through the guides g^6 , withdraw the projections a^2 from the runway c . Upon this movement the connection of the key-plate with the numbering-machine frame is destroyed, and weights g^7 , connected with the frame B' by cords or chains, will retract said frame to the position shown in Fig. 1.

The rearward movement of the numbering-machine frame is intended to operate the numbering-machine C' to effect an impression. To attain this operation, therefore, I provide rollers c^2 , respectively projecting laterally from the upper portion of the numbering-machine C', and respectively running through vertical slots in the sides of the frame B' into a triangular recess in the upper end of each standard D'. These standards arise from the carriage B and have in their upper ends triangular switches d^2 , actuated by springs e^2 . As the frame B' moves rearward the rollers c^2 will run around the switch d^2 , so as to give the numbering-machine C' a vertical reciprocation. The numbering-machine C' may be of any known form, and as is usual in such machines will be progressively adjusted from the movement of the key-plates. The key-plates carry superposed sheets of paper or other writing material, forming blocks from which the top sheets may be successively torn.

In the use of my invention a number of key-plates o^2 , which correspond with the frames E, are provided, and each key-plate is given such an arrangement of grooves o and o' as will correspond to the several frames E and their respective webs n .

An operator now projects one of the key-plates through the opening a in the manner indicated by Fig. 1, whereupon the numbering-machine will be caused to impress a number on the top sheet of the block of paper. A continuation of the inward movement performs the operation hereinbefore described, which results in the copying of the writing on one of the webs n .

The invention is useful for copying accounts of sales-slips in mercantile houses. Each salesman or other clerk will be provided with one of the key-plates which will refer exclusively to a definite web n . Therefore it is impossible for any of the webs to be tampered with or fraudulently impressed, and at the same time a highly-accurate record is kept by the proper clerk.

The invention is also useful in other connections, as will be apparent to those skilled in the art.

What I claim is—

5 1. The combination with a base, of a disk revolubly mounted thereon and having means for carrying a plurality of copying-sheets, movement-transmitting devices capable of turning the disk to adjust said copy-
10 ing-sheets, and means for dampening and impressing said sheets and operating immediately subsequent to the adjustment of the disks, substantially as described.

2. The combination with a base, of a carriage sliding thereon, a disk revolubly mounted
15 on the carriage and having means for carrying copying-sheets, movement-transmitting devices supported on the carriage and serving to turn the disk to adjust the copying-sheets, a numbering-machine movable
20 on the carriage, a stationary guide for giving the numbering-machine vertical movement, a dampening-roller for the copying-sheets, and a press reciprocated vertically
25 by the movement of the carriage, substantially as described.

3. The combination with a base, of a sliding carriage, a disk revolubly mounted on the carriage and having means for carrying copy-
30 ing-sheets, a slide movable in the carriage and connected with the disk to turn the same, a dampening device for the copying-sheets, and a vertically-movable press held on the carriage and having a guide-slot receiving a
35 member rigid with the base, substantially as described.

4. The combination with a base, of a carriage movable on the base, a disk revolubly mounted in the carriage and having a series
40 of devices for carrying copying-sheets, such devices being independently slidable on the disk, an operated press movable toward and from the copying-sheets and supported by the carriage, a dampening-roller located
45 between the disk and press, and means operated by the movement of the carriage, for independently sliding the devices for carrying the copying-sheets, whereby the copying-sheets are moved over the dampening-roller
50 and in position to be engaged by the press, substantially as described.

5. The combination with a base, of a carriage slidable on the base and having a plurality of independently-movable devices for
55 carrying copying-sheets, gearing for adjusting the disk, a reciprocating bar on the carriage and capable of engaging the respective devices, and gearing connected with said bar and operated upon the sliding movement of
60 the carriage, substantially as described.

6. The combination with a base, of a sliding carriage thereon, a revolubly mounted and operated disk, a plurality of frames slidable
65 on the disk, two rollers journaled in each frame, each pair of rollers being adapted to carry a copying-sheet, a bar slidable on the carriage and capable of connection with each

frame of the disk, and gearing for moving the bar, such gearing being operated by the movement of the carriage, substantially as described. 70

7. The combination with a base, of a carriage slidable thereon, a revoluble and operated disk on the carriage, independently-movable copying-sheet-carrying devices supported
75 by the disk, and means operated by the movement of the carriage for individually moving the copying-sheet-carrying devices, substantially as described.

8. The combination with a base, of a carriage sliding on the base, a revoluble and operated disk on the carriage, a series of independently-movable copying-sheet-carrying
80 devices for the disk, a bar sliding on the carriage and capable of connection with said copying-sheet-carrying devices, and means for reciprocating the bar upon the movement
85 of the carriage, substantially as described.

9. The combination with a support, of a revoluble disk on the support, a gear-wheel fixed
90 to the axis of the disk, two sectors meshing with the gear-wheel, two slides on the support, and a connection respectively between the slides and sectors, substantially as described. 95

10. The combination with a support, of a revoluble disk supported on the support and having copying-sheet-carrying devices held
100 on the disk, a gear-wheel fixed to the axis of the disk, two sectors meshing with the gear-wheel, two slides independently movable adjacent to the disk, connections respectively
105 between the slides and sectors, and a key provided with two dissimilar grooves respectively capable of coacting with the slides, substantially as described.

11. A key for copying-machines, the key consisting in a board having two dissimilar grooves in one face, substantially as described.

12. The combination with a base, of a carriage slidable on the base, a disk revolubly
110 mounted on the carriage, means for turning the disk, a series of frames carried by the disk and slidable thereon, parallel with the axis of the disk, two rollers carried by each frame,
115 the rollers being capable of carrying copying-sheets, a sliding bar held on the carriage and capable of connection with each frame, gearing connected with the bar, and a rack held
120 off the carriage and in connection with said gearing, substantially as described.

13. The combination with a support, of a frame, a spirally-grooved shaft slidable in the support, a projection carried by the support
125 and fitting in the groove of the shaft whereby to turn the shaft when the shaft slides, and two rollers held by the frame, one of which rollers is in connection with the shaft, substantially as described.

14. The combination with a support, of a shaft slidable in the support and having a
130 spiral groove, the groove receiving a part rigid with the support whereby to turn the shaft when the shaft slides, a frame sliding with the

shaft, and two rollers carried by the frame, one of which rollers is actuated by the shaft, substantially as described.

15. The combination with a support, of a frame having sliding connection with the support, a roller within the frame, and a shaft actuating the roller, the shaft being turned by the sliding movement of the frame, substantially as described.

16. The combination with a support, of a frame having sliding movement on the support, two rollers within the frame, a copying-sheet wound on the rollers, and a shaft sliding with the frame and having connection with one of the rollers, the shaft being turned upon the sliding of the frame, substantially as described.

17. The combination with a base, of a carriage sliding on the base, a sliding copying-sheet-carrying device supported on the carriage, means for sliding said copying-sheet-carrying device upon the movement of the carriage, a dampener over which the copying-sheet-carrying device is movable, a press reciprocal toward and from the copying-sheet-carrying device and having a cam-groove, and a part rigid with the base and received in the cam-groove, substantially as described.

18. The combination with a base, of a carriage sliding on the base, a disk revolvably mounted on the carriage, means for turning the disk, a series of copying-sheet-carrying devices held on the disk, a reciprocal press carried by the carriage, and a member stationary with the base and engaging with the press whereby to operate the same upon the movement of the carriage, substantially as described.

19. The combination of a sliding copying-sheet-carrying device, a dampener, a spring pressing the dampener, and a catch normally holding the dampener inactive, the catch being released by the movement of the copying-sheet-carrying device whereby the dampener may engage the copying-sheet, substantially as described.

20. The combination of a sliding copying-sheet-carrying device, a movable frame, a dampener carried by the frame, a spring pressing the frame, and a catch normally restraining the frame, the catch being released by the copying-sheet-carrying device, substantially as described.

21. The combination of a sliding copying-sheet-carrying device having teeth thereon, a movable frame, a dampener carried by the frame, a spring pressing the frame, a catch normally restraining the frame, and a sector in connection with the catch, the sector being engaged by the teeth of the copying-sheet-carrying frame, substantially as described.

22. The combination with a frame, of a carriage sliding on the frame, a disk revolvable on the carriage, a gear-wheel fixed to the axis of the disk, two sectors engaging the gear-wheel, a link connected to each sector, two slides movable in the frame and having pro-

jections extending through slots therein and above the frame, the slides being respectively connected to the links, and a key having two dissimilar grooves, the grooves respectively receiving the projections, substantially as described.

23. A machine for copying, the machine having a series of copying-sheet-carrying devices, and means for adjusting and applying the copying-sheets, and a key for the machine, the key operating on said means whereby to effect a certain copying-sheet, substantially as described.

24. A machine having a plurality of copying-sheets, means for moving and impressing the copying-sheets, and a key related to a certain copying-sheet, the key being capable of affecting said means so as to impress said certain copying-sheet, substantially as described.

25. The combination with a base, of a carriage movable on the base, a numbering-machine having sliding movement on the carriage, a frame having a triangular opening in which a portion of the numbering-machine is projected, and a yieldingly-supported block located within the opening of the frame to form a triangular slot therein, substantially as described.

26. The combination with a base, of a carriage movable on the base, an auxiliary carriage having sliding movement on the first carriage, a projection connected with the auxiliary carriage and adapted to be engaged to independently move the auxiliary carriage, a numbering-machine vertically movable in the auxiliary carriage, and a frame carried by the base and having a slot imparting vertical movement to the numbering-machine upon the movement of the auxiliary carriage, substantially as described.

27. A copying-machine having an adjustable disk provided with a plurality of copying-sheet-carrying devices, means for adjusting the disk to bring any one of the said devices into operative position and means for impressing the copying-sheets, substantially as described.

28. A copying-machine having an adjustable disk provided with a plurality of copying-sheet-carrying devices, and means for adjusting the disk to place any one of the copying-sheet-carrying devices in operative position, substantially as described.

29. The combination with a base of a carriage having a runway and also having an inclined guideway, a numbering-machine slidable on the carriage, a lug in connection with the carriage and controlled by the guideway, the lug normally projecting into the runway, and the guide serving to move the lug out of said runway as the numbering-machine is moved independently of the carriage and means for operating the numbering-machine, substantially as described.

30. The combination with a support having a runway and a guide inclined with relation

to the runway, of a numbering-machine slidable on the support and longitudinally with the runway, a lug in connection with the numbering-machine and normally projecting into
5 the runway, a spring pressing the lug, a roller carried by the lug and running in the inclined guideway and means for operating the numbering-machine, substantially as described.

31. A copying-machine having a plurality
10 of copying-sheet-carrying devices, an adjustable holder for said devices, and means for

operating the adjustable holder to bring any one of the copying-sheet-carrying devices into operative position, substantially as described.

In testimony whereof I have signed my
15 name to this specification in the presence of two subscribing witnesses.

JULES FRYDMANE.

Witnesses:

LÉON FRANCKENS,

EDWARD P. MACLEAN.