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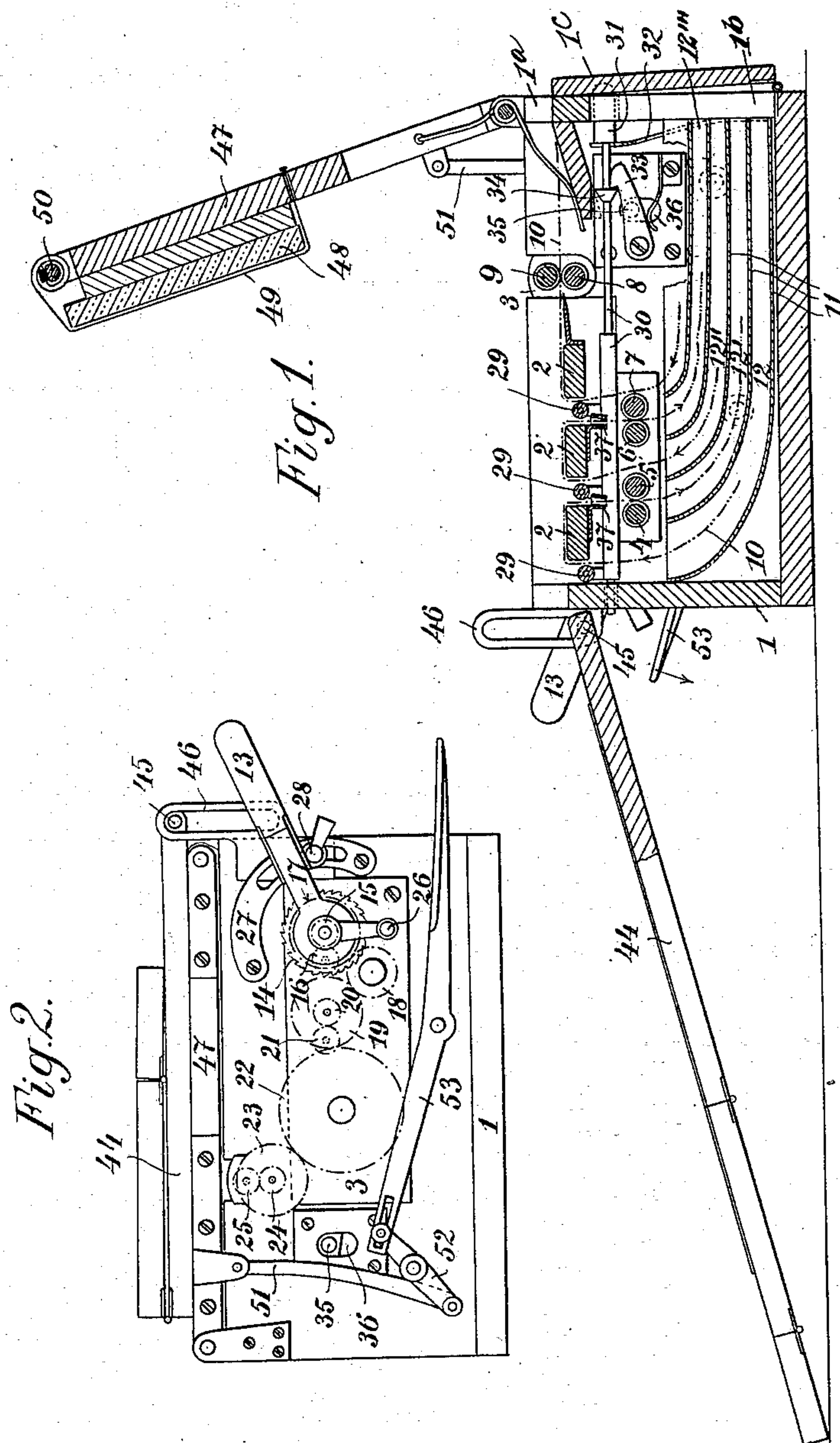
Patented June 19, 1900.

C. TSCHINKEL.
MULTIPLEX WRITING APPARATUS.

(Application filed Feb. 28, 1899.)

3 Sheets—Sheet 1.

(No Model.)



Witnesses.
B. B. B.
B. K. Sommers

Inventor.
Camille Tschinkel.
by *N. M. Oth*
Att'y.

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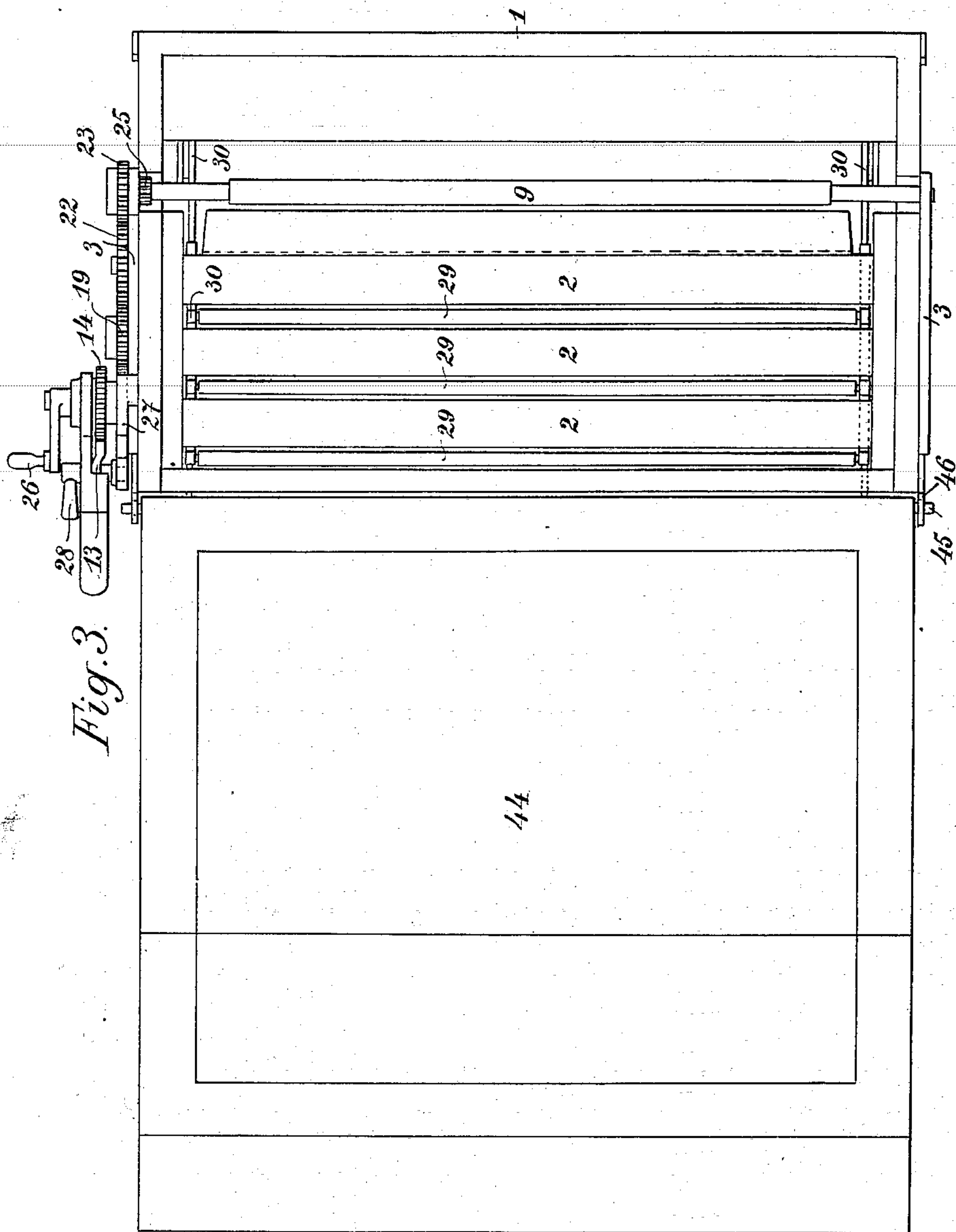
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MULTIPLEX WRITING APPARATUS.

(Application filed Feb. 28, 1899.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses.
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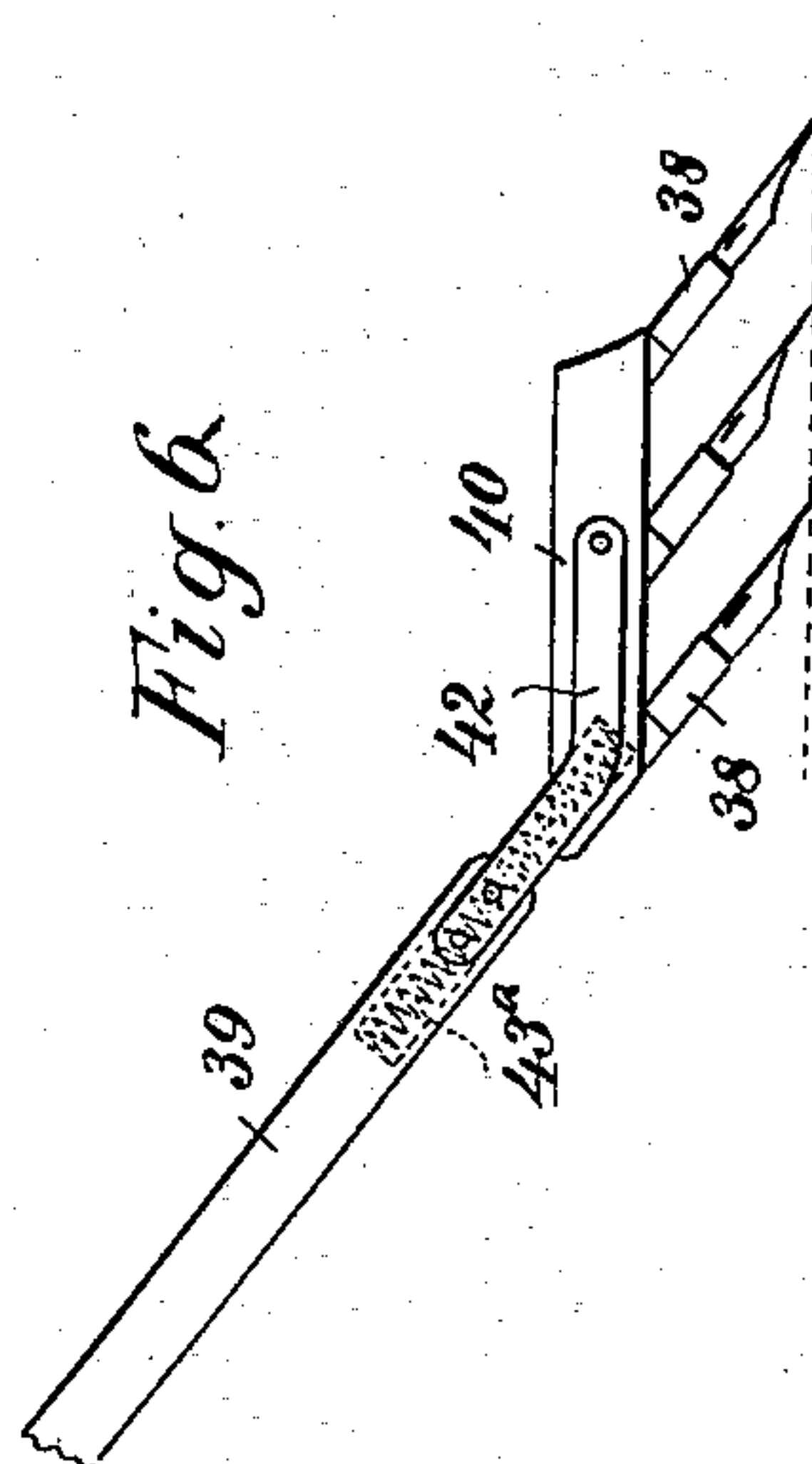
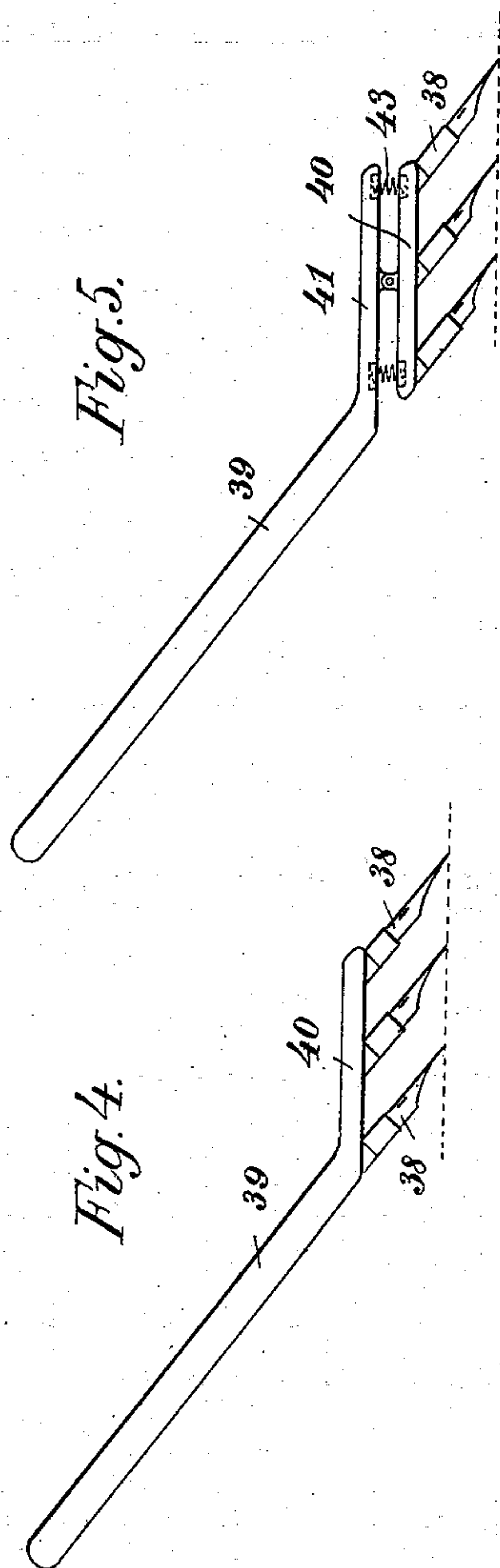
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MULTIPLEX WRITING APPARATUS.

(Application filed Feb. 28, 1899.)

(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

CAMILLO TSCHINKEL, OF VIENNA, AUSTRIA-HUNGARY.

MULTIPLEX-WRITING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 651,903, dated June 19, 1900.

Application filed February 28, 1899. Serial No. 707,184. (No model.)

To all whom it may concern:

Be it known that I, CAMILLO TSCHINKEL, a subject of the Emperor of Austria-Hungary, residing at Vienna, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Multiplex-Writing Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to apparatus designed to enable a number of sheets to be written on at the same places simultaneously, and thus to produce in one single writing operation a number of identical documents.

In this apparatus the sheets which are to be written on at suitable places by means of a multiple pen or of a multiple lead-pencil are passed over fixed supporting-bars and between pairs of pressure-rollers covered with elastic material and capable of being moved by means of ratchet mechanism, so that the sheets are drawn forward to an extent equal to the distance between the lines of writing. This writing instrument comprises several pens or pencils attached to a support which is arranged obliquely to the holder and which may be attached to the holder either rigidly or pivotally, and which is rendered flexible by means of compression-springs or tension-springs inserted between the holder and the support, whereby a uniform bearing of all the pens or pencils upon the sheets is produced. An apparatus of this kind for simultaneously writing a number of identical documents is illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical longitudinal section through the apparatus shown in the position of use. Fig. 2 is a side elevation of the apparatus in which some parts of the same are shown in the inoperative position. Fig. 3 is a plan of the apparatus. Figs. 4, 5, and 6 illustrate various constructions of the multiple pen, (in the present case a triple pen.)

As shown, in the box 1 there are transverse bars 2 equal in number to the number of the

identically-similar documents that are to be produced. In the side walls of the box 1 or in plates 3 therein there are mounted three pairs of rollers 4 5, 6 7, and 8 9, corresponding to the number of cross-bars. Of these pairs of rollers the first two pairs are arranged below the cross-bars 2, while the third pair of rollers 8 9 are arranged behind the last cross-bar 2. The rollers of all the pairs are covered with elastic material, preferably caoutchouc, and they serve to grasp the sheets to be written on and to draw them forward. The sheets (indicated by dash-dotted lines in Fig. 1) are inserted with their lower ends loosely into the slot (situated in front of the cross-bar) into the box. The upper end of the sheet is passed over the corresponding cross-bar 2 and is inserted into the slot situated behind the latter in such a manner that the upper edge of the sheet will be caught by the corresponding pair of rollers. This is facilitated by the fact that guides 37 are attached to the lower side of the cross-bars, as shown in Fig. 1. The last sheet is inserted through a slot 1^a in the rear wall of the box 1, directly over the rear bar 2, between the corresponding pair of rollers 8 9, which are arranged laterally of the said bar.

For the purpose of keeping the parts of the sheet that enter the inside of the box well apart round bent parallel metal plates 11 are provided, between which there are formed guide-slots 12 12' 12'' 12''' for the sheets that move over the bars. The metal plates 11, as shown in Fig. 1, are arranged below the feed-rolls 4 5 and 6 7 and extend to an opening 1^b in the rear wall of the box 1, below the opening 1^a. The sheet of paper 10 in the forward guide 12 moves over the forward cross-bar 2, and thence between rollers 4 5 into guide slot or passage 12'. The second sheet of paper in the guide-slot 12'' moves over the next cross-bar 2, and thence between feed-rolls 6 7 into guide-slot 12''', while the third sheet of paper passes over the upper one of the plates 11 in the direction of the arrow, thence over the last cross-bar 2, thence between the rolls 8 9, and is withdrawn when written upon from the rear end of the box 1 through the aperture 1^a, while the first two sheets are withdrawn through the aperture 1^b. The movement of the pairs of rollers is effected by means of

a ratchet mechanism which consists of a ratchet-pawl 13, having a handle and a ratchet 14, upon the shaft of which there is mounted a small toothed wheel 15, which is rigidly connected to the roller 4 and which gears with a toothed wheel 16 of the same size, that is rigidly connected to the second roller 5. The transmission of the motion of the ratchet mechanism to the other pairs of rollers is effected by means of the toothed wheel 17, that is mounted on the ratchet-wheel shaft—that is to say, through the medium of the intermediate wheels 18 19 20 21 to the pair of rollers 6 and 7, and from the wheel 19, through the medium of the intermediate wheels 22, 23, 24, and 25, to the last pair of rollers 8 and 9. The transmission is effected, as will be seen from Fig. 2, in such a manner that the sheets will be carried along in the same direction and with the same speed. On the outer end of the ratchet-wheel shaft there is mounted a crank-handle 26, by means of which (after the permanent disengagement of the ratchet-pawl from the ratchet-wheel) the pairs of rollers can be rotated at will in either direction. The stroke of the ratchet-pawl is limited by means of a stop 28, which is movable, and is adjustable in a slotted arc-shaped piece 27. By shifting this stop the stroke of the ratchet-pawl, and consequently the extent of the forward movement of the sheets—that is to say, the distance apart between the lines—can be varied as desired.

For the purpose of effecting an exact bearing of the sheets upon the surface of the cross-bars there is provided a brake device, which consists of a friction-roller 29 for each cross-bar. The friction-rollers are arranged in the slot situated in front of the corresponding cross-bars and are each mounted in a rotary manner in a common sliding bar 30 at both ends. The rearward extension of the latter terminates in two pressure-knobs 31, that project from the rear wall of the box, and it is subject to the pressure of the flat springs 32, which have a tendency to push the sliding bars 30 backward. Below each of the two sliding bars 30 there is a spring-pawl 33 fixed pivotally to the side wall of the box. This pawl is caused by the forward movement of the sliding bar 30, produced by pressing the knob 31, to engage over a conical lug 34 on the bar 30 and to keep the latter in its position. A pin or knob 35, fixed on the side of the pawl 33, extends through a slot 36 in the side wall of the box, and it can be pressed down by hand in opposition to the action of the spring, so as to disengage the sliding bar 30, which is pressed backward by the action of the spring 32. When both sliding bars have been disengaged in this manner, all the friction-rollers 29 bear against the front surfaces of the corresponding cross-bars, with the result that the sheets of paper which are situated between the cross-bars and the friction-rollers are gripped with a moderate pressure. By means of the friction thus produced the

sheets are maintained in tension, so that they will lie flat upon the cross-bars.

The opening 1^b in the rear wall of box 1 is closed by gate 1^c, which may be secured in a closed position by any suitable means, said gate having bearing on the push-knobs 31 of the bars 30 and holding said bars in their forward position, with the clamping or brake rolls 29 out of contact with the cross-bars 2, so that when the apparatus is to be used the various sheets of paper may be positioned, which could not otherwise be conveniently done, after which the gate may be opened to allow the springs 32 to move the bars 30 backward to cause the clamping or brake rolls to clamp the sheets of paper to their respective bars. This gate may also be made use of, especially when writing upon very thin paper, whenever the sheets are to be fed forward the distance of a line, as the gate can be closed with one hand to disengage the rollers 29 from the writing-bars 2 and the feed-pawl 17 actuated with the other.

The pens or pencils used for writing comprise as many pens or pencils 38 as there are cross-bars 2. In the present case there are three of such pens 38, which are fixed to a carrier 40, that is arranged at a suitable angle to the holder 39.

In the arrangement shown in Fig. 4 the carrier 40 is rigidly connected to the holder. In the multiple pen shown in Fig. 5 the carrier 40 is pivotally connected at its middle to an extension 41 of the holder 39, substantially parallel to the part 40, compression-springs 43 being inserted at both ends between the parts 40 and 41. In the arrangement shown in Fig. 6 the two arms 42, that form a fork, are fixed to the holder 39, and the carrier is pivotally mounted in the ends of said arms, a spiral spring 43^a being inserted between the holder 39 and the carrier 40.

In writing the pen is placed upon those parts of the sheets of paper (that are clamped in the manner described) which pass over the cross-bars. Whereas writing with the rigid pen, Fig. 4, requires a greater skill, the two other pens can be easily manipulated, because by reason of the yielding connection of the carrier 40 with the holder of the pen, a constantly-uniform bearing or pressure of all the pens upon the sheets is insured. In all cases the hand must, however, be well supported during writing, and for this purpose there is provided at the front of the box a sloping plate 44, which consists, preferably, of a number of parts hinged together, and which is supported by means of side pins 45 in vertically-slotted guides 46, projecting in front of and attached to the side walls of the box. In position of use, as shown in Fig. 1, the front edge of the plate 44 rests on the table and the pins 45 are supported by the lower ends of the guides 43. When the apparatus is out of use, the plate 44 can be folded together, as shown in Fig. 2, and over the whole apparatus as a cover. To the rear edge of

the box there is hinged an apparatus designed for blotting off the freshly-written matter. This apparatus consists of a hinged plate 47, which is raised by spring-pressure and upon
 5 which blotting-paper 49 is stretched over an elastic underlay 48. This blotting-paper is fixed at one end in a slot in the plate and at its other end is wound on a rotary clip 50 of any known kind. The plate 47 is connected
 10 by a link 51 and lever 52 with a slotted lever 53, by depressing which the plate is brought down, so that the blotting-paper can blot off the freshly-written matter on the sheets.

I claim—

15 1. In a multiplex-writing apparatus, a plurality of spaced writing-bars, a pair of feed-rolls near each of said bars, means for separately guiding a sheet of paper over each of said bars, gearing imparting synchronous
 20 feed movements to all of said pairs of rolls, and mechanism for determining the amplitude of said feed movements, for the purpose set forth.

25 2. In a multiplex-writing apparatus, a plurality of spaced writing-bars, a pair of feed-rolls near each of said bars, means for separately guiding a sheet of paper over each of said bars, gearing imparting synchronous
 30 feed movements to all of said pairs of rolls, and adjustable mechanism for varying the amplitude of said feed movements, for the purpose set forth.

35 3. In a multiplex-writing apparatus, a plurality of spaced writing-bars, a clamping-roller in front of each bar, means automatically moving said rollers into contact with their
 40 respective bars, and means for moving said rollers out of contact with their said bars, for the purpose set forth.

45 4. In a multiplex-writing apparatus, a plurality of spaced writing-bars, a clamping-roller in front of each bar, means automatically moving said rollers into contact with
 50 their respective bars, means for moving said rollers out of contact with their said bars, and means for holding said rollers out of contact, for the purpose set forth.

55 5. In a multiplex-writing apparatus, a plurality of spaced writing-bars, a clamping-roller in front of each bar, a pair of feed-rolls below each of the first two bars and at the
 60 rear of the last bar, guides for each separate sheet of paper leading respectively to a clamping-roll and from a pair of feed-rolls, and
 65 mechanism for moving the clamping-rolls into and out of contact with their respective writing-bars, for the purpose set forth.

6. In a multiplex-writing apparatus, a plurality of spaced writing-bars, mechanism for
 70 progressively and synchronously feeding a sheet of writing material over each of said bars, clamping devices, and means for simultaneously operating the same to clamp said
 75 sheets to their respective bars, for the purpose set forth.

7. In a multiplex-writing apparatus, a plurality of spaced writing-bars, mechanism for

progressively and synchronously feeding a sheet of writing material over each of said bars, a clamping-roller in front of each of the
 80 bars, supports common to all the rollers, and mechanism for displacing said supports to move the rollers into and out of contact with the vertical front face of the writing-bars, for the purpose set forth.

8. In a multiplex-writing apparatus, a plurality of spaced writing-bars, mechanism for progressively and synchronously feeding a sheet of writing material over each of said
 85 bars, a clamping-roller on one side of each bar, a support common to all said rollers, a spring or springs acting on said support to hold the rollers in contact with the vertical front face of their respective bars, and means
 90 for moving the support and locking the same against the stress of its spring or springs, for the purpose set forth.

9. In a multiplex-writing apparatus, a plurality of spaced writing-bars arranged in tandem, a feed-duct on one side of each bar, a
 95 delivery-duct on the opposite side of all the bars except the last, a pair of drawing-rolls above the delivery-ducts, and a pair of like rolls in rear of the last of said bars, and mechanism for progressively and synchronously
 100 revolving the drawing-rolls; in combination with a spring-controlled clamping-roller above each feed-duct for clamping a sheet of writing material to the vertical face of each of said bars, for the purpose set forth.

10. In a multiplex-writing apparatus, the combination with the box or casing, and a plurality of writing-bars arranged transversely
 105 therein near its upper edge, of a spring-retracted blotting-pad hinged to the rear end of such box, said pad fitting the box above the writing-bars, means for depressing the pad onto the writing-bars, and means for retaining
 110 said pad into depressed position, for the purpose set forth.

11. In a multiplex-writing apparatus, the combination with the box or casing and a plurality of writing-bars arranged transversely
 115 therein near its upper edge; of a spring-retracted blotting-pad fitting into the upper end of the box, and means for moving the pad onto the writing-bars, and a folding hand-rest articulated to the forward end of the box and
 120 folding onto said blotting-pad when depressed into the box, for the purpose set forth.

12. In multiplex-writing apparatus comprising a box, a plurality of writing-bars spaced and rigidly secured therein, mechanism for progressively and synchronously feeding
 125 a sheet of writing material over each of said bars, and a blotter hinged to one end of said box to fold into the same; in combination with a foldable hand-rest hinged to the opposite end of said box in vertically-elongated bearings and adapted to fold onto the
 130 blotter and form, when folded, a cover for the box, substantially as set forth.

13. In multiplex-writing apparatus, comprising a box provided in its rear end wall

with two superposed apertures extending across said box, three writing-bars spaced and rigidly secured therein near the opposite end thereof, a feed-passage on the front side 5 and below each of said bars, a delivery-passage in rear of and below two of said bars extending to the lower opening in the rear wall of the box, a pair of drawing-rolls above each delivery-passage for two of the bars, a similar pair of rolls in rear of the third bar, said 10 rolls having their nip substantially in line with the upper opening in the aforesaid rear wall of the box, clamping-rolls in front of each of said bars, a spring-controlled support common to all of said clamping-rolls to clamp the 15 writing material to the front vertical face of the writing-bars and means for moving and holding the said rolls out of contact with said bars; in combination with a blotter-carrier 20 hinged to the rear wall of the box to fold onto the writing-bars and a foldable hand-rest hinged to the front wall of the box to fold upon the blotter and form a cover for the box, substantially as described.

25 14. In a multiplex-writing apparatus, a box or casing, a plurality of writing-bars therein, a pair of feed-rolls for each of said bars, and mechanism for imparting synchronous feed movements to each of said pairs of rolls; in 30 combination with a pair of guides for each writing-bar and separate sheet of paper, re-

spectively leading to the writing-bars and from the feed-rolls thereof, for the purpose set forth.

15. In a multiplex-writing apparatus, three 35 writing-bars 2, a clamping-roller in front of, and a pair of feed-rolls between and below each two bars, and a like pair of rolls in rear of and above the last bar; in combination with mechanism for moving the clamping- 40 rolls into and out of contact with their respective writing-bars, and mechanism for imparting synchronous feed movements to the three pairs of feed-rolls, for the purpose set forth.

16. In a multiplex-writing apparatus, a plurality of writing-bars and mechanism for progressively and synchronously feeding a sheet of writing material over each of said bars, and in combination therewith, a carrier carrying inscribing devices, one for each writ- 50 ing-bar, a holder to which said carrier is pivoted, and resilient bearings between the carrier and holder, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

CAMILLO TSCHINKEL.

Witnesses:

ALVESTO S. HOGUE,
AUGUST FUGGER.