

**No. 620,960.**

Patented Mar. 14, 1899.

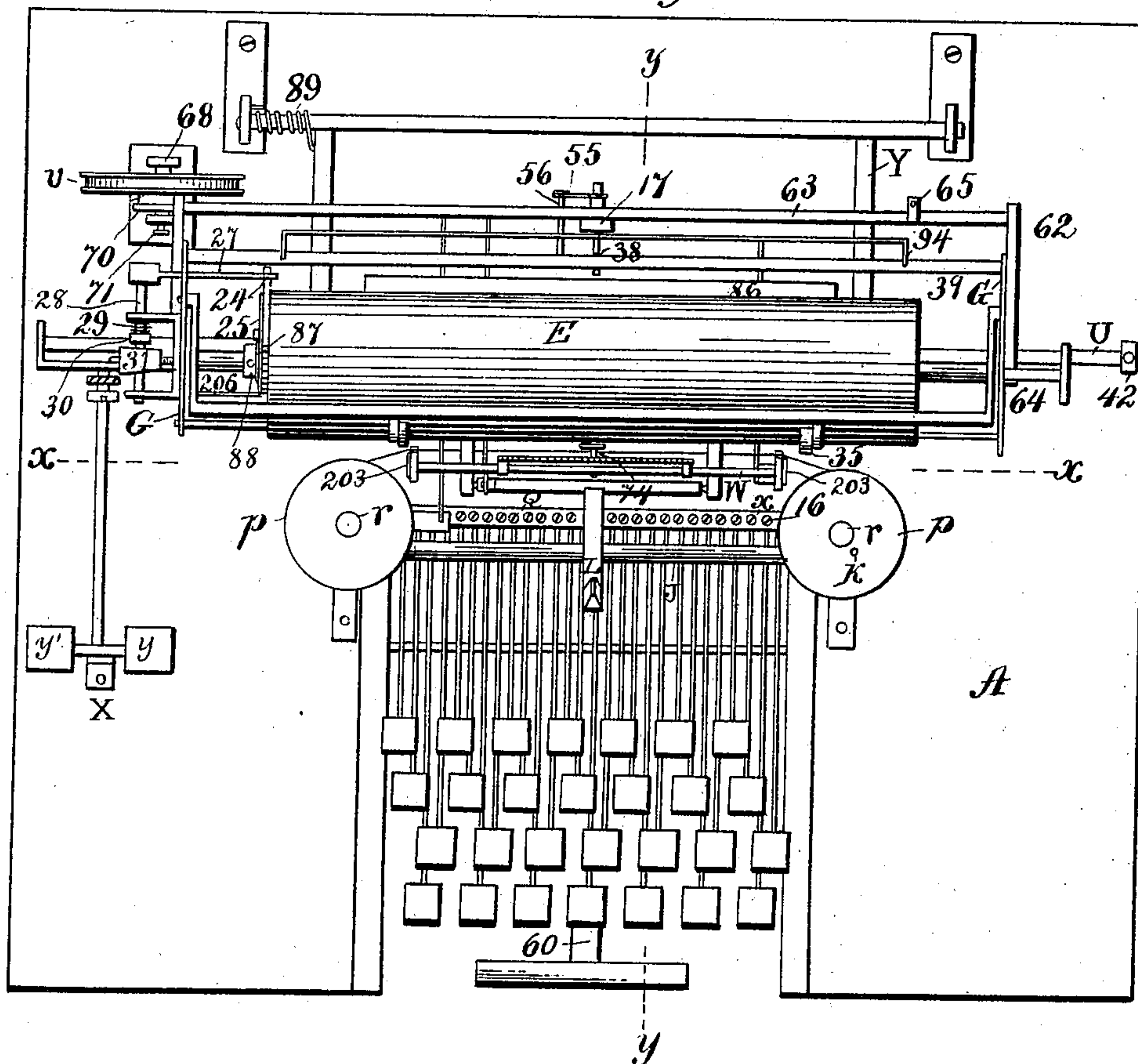
**J. PRATT.**  
**TYPE WRITING MACHINE.**

(Application filed June 20, 1895.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1



*Witnesses:*

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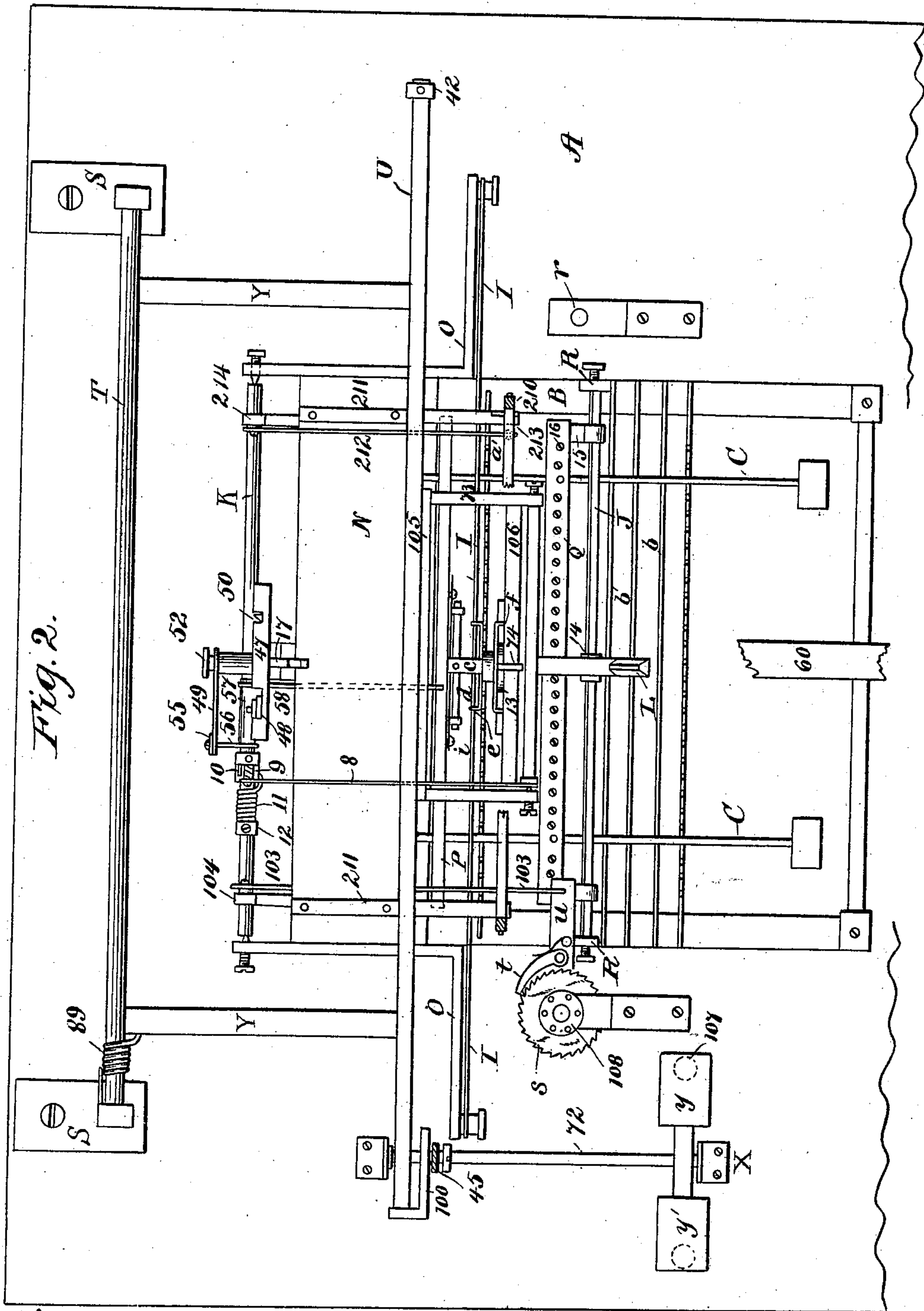
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4 Sheets—Sheet 2.



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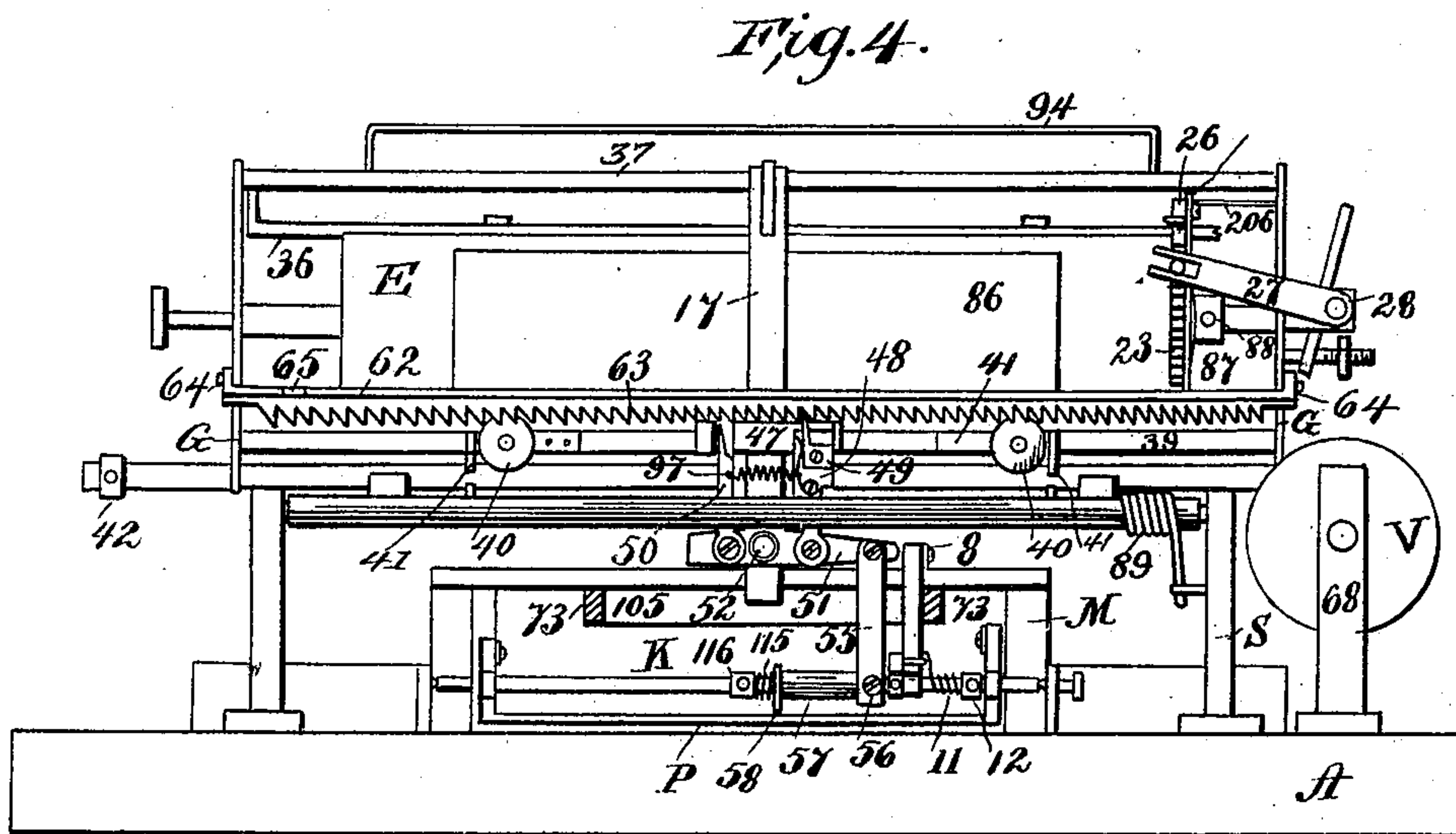
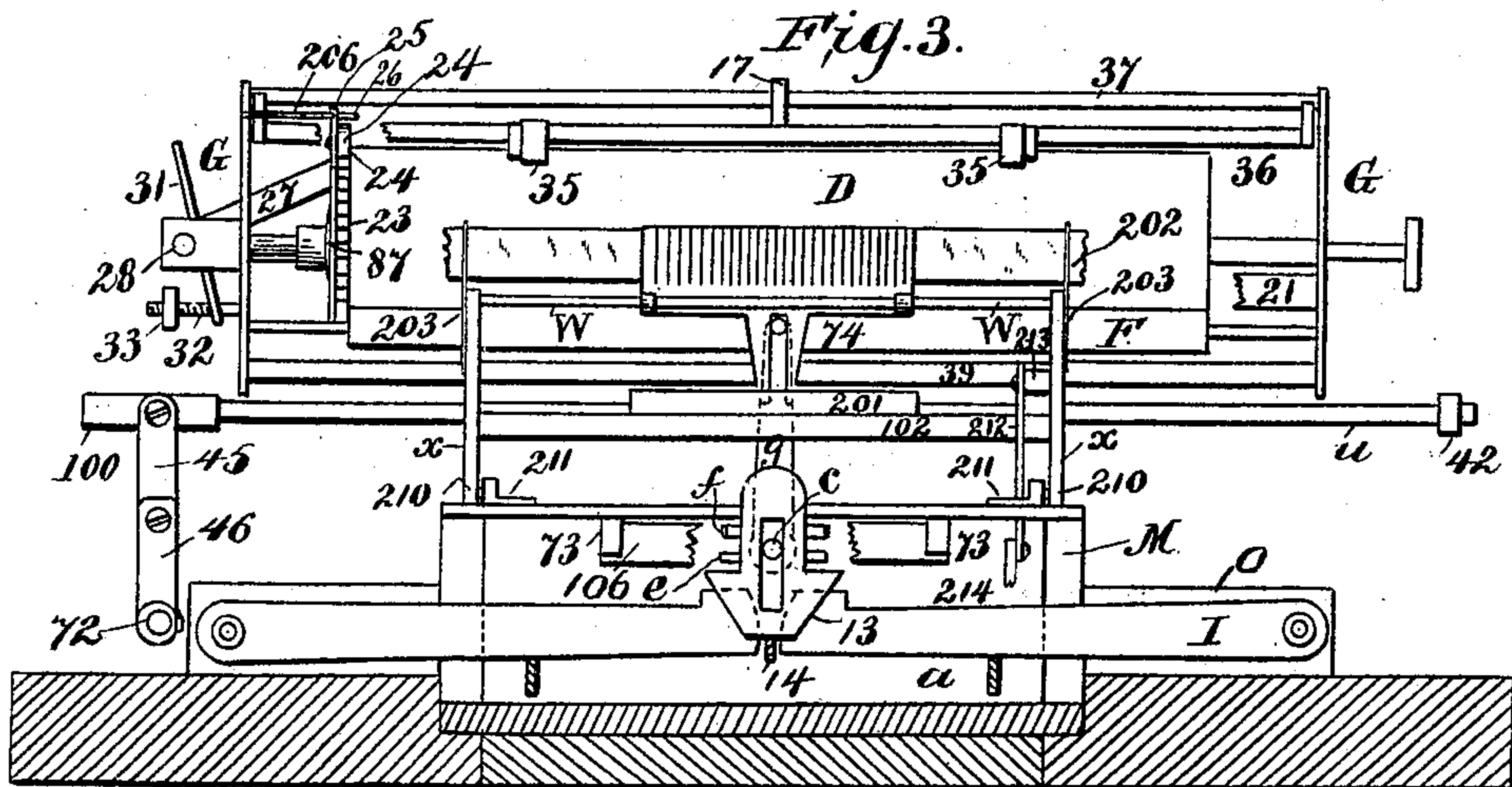
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4 Sheets—Sheet 3.



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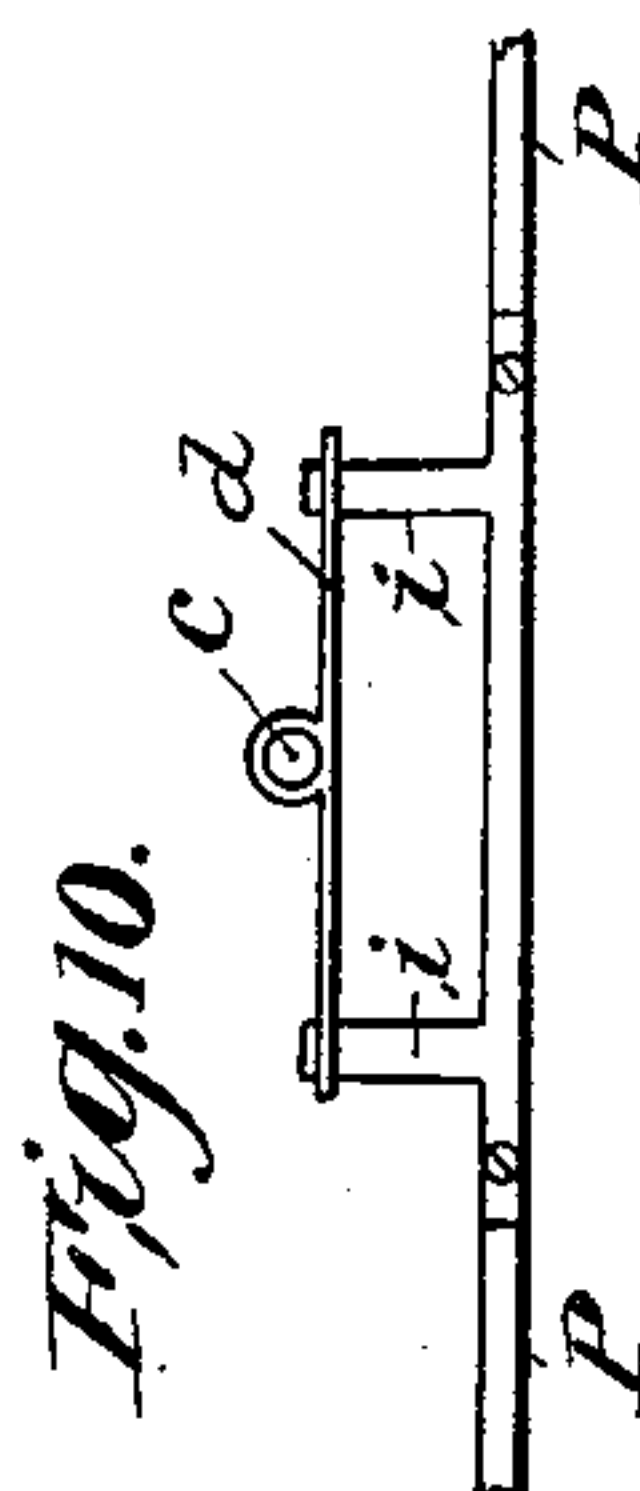
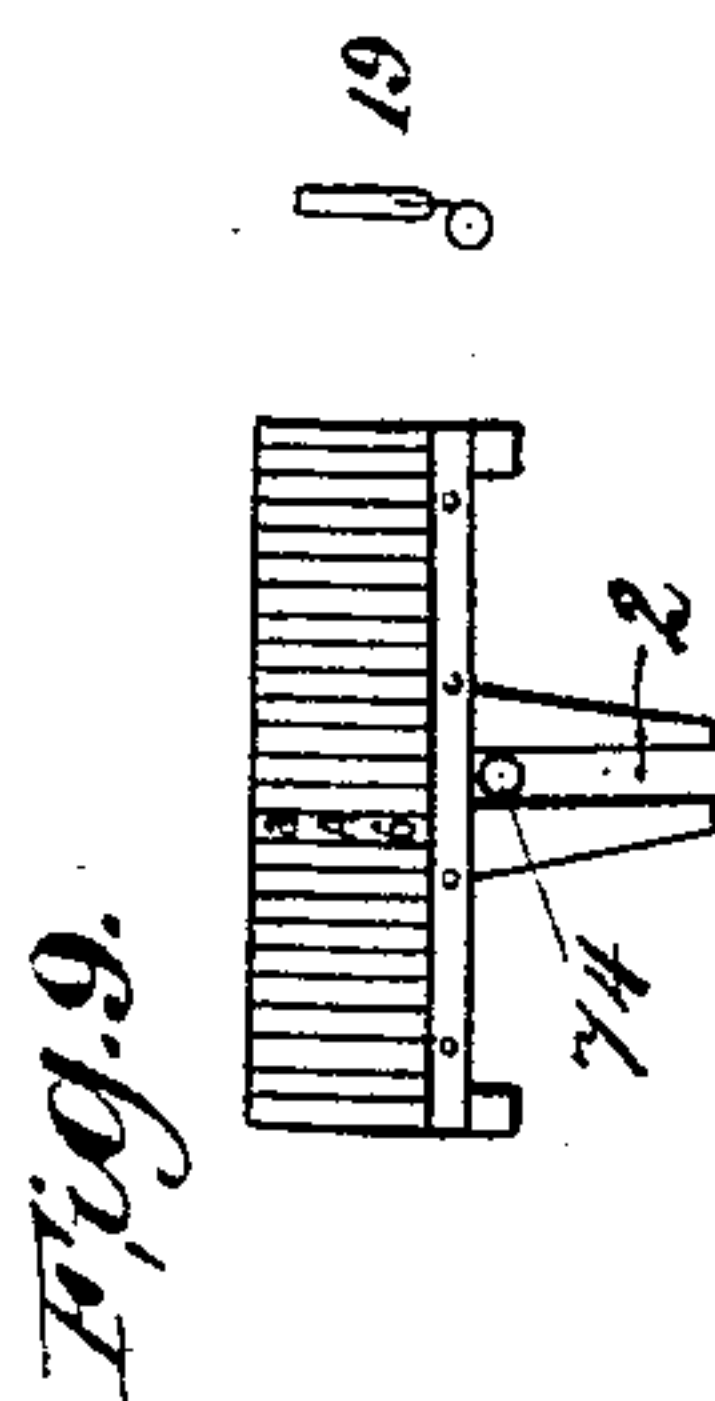
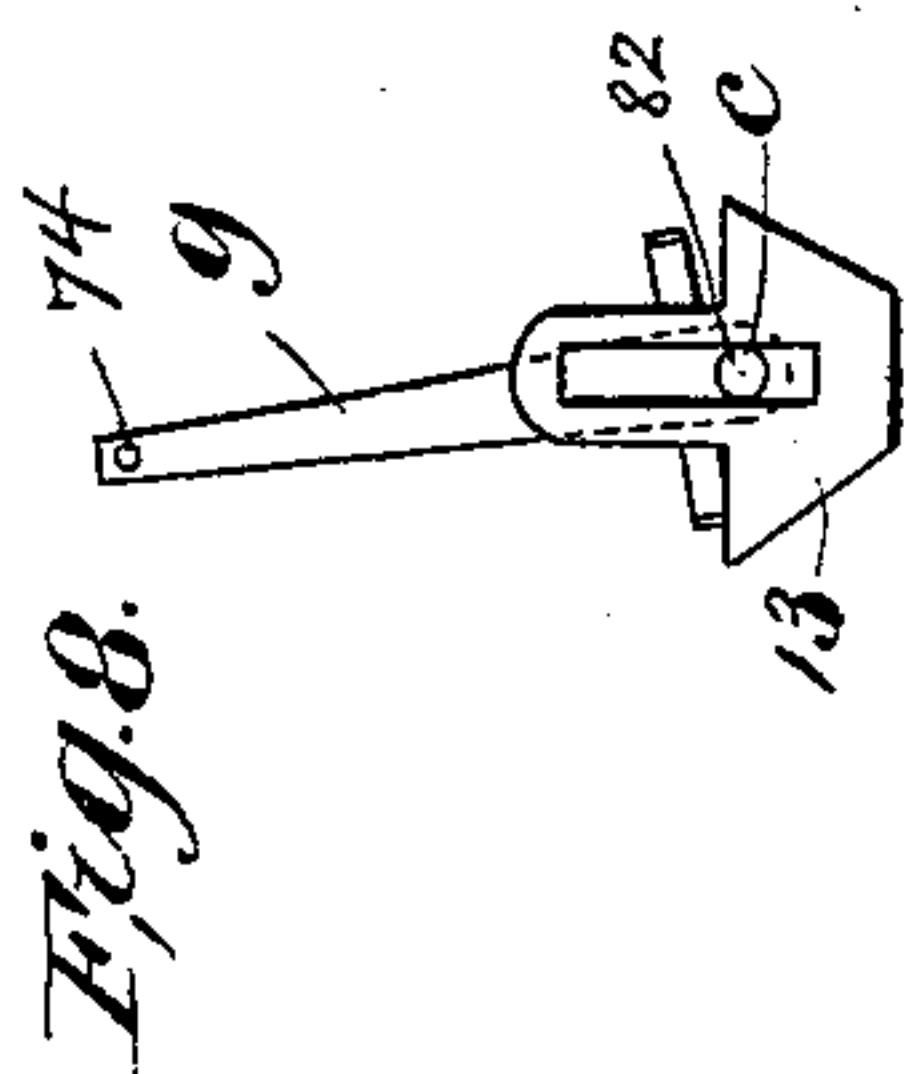
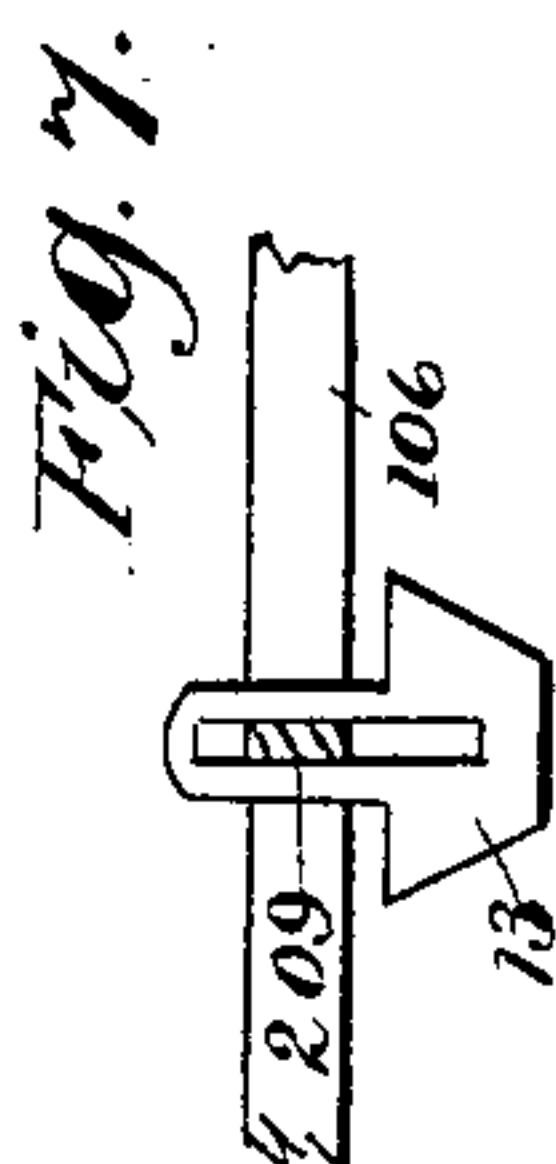
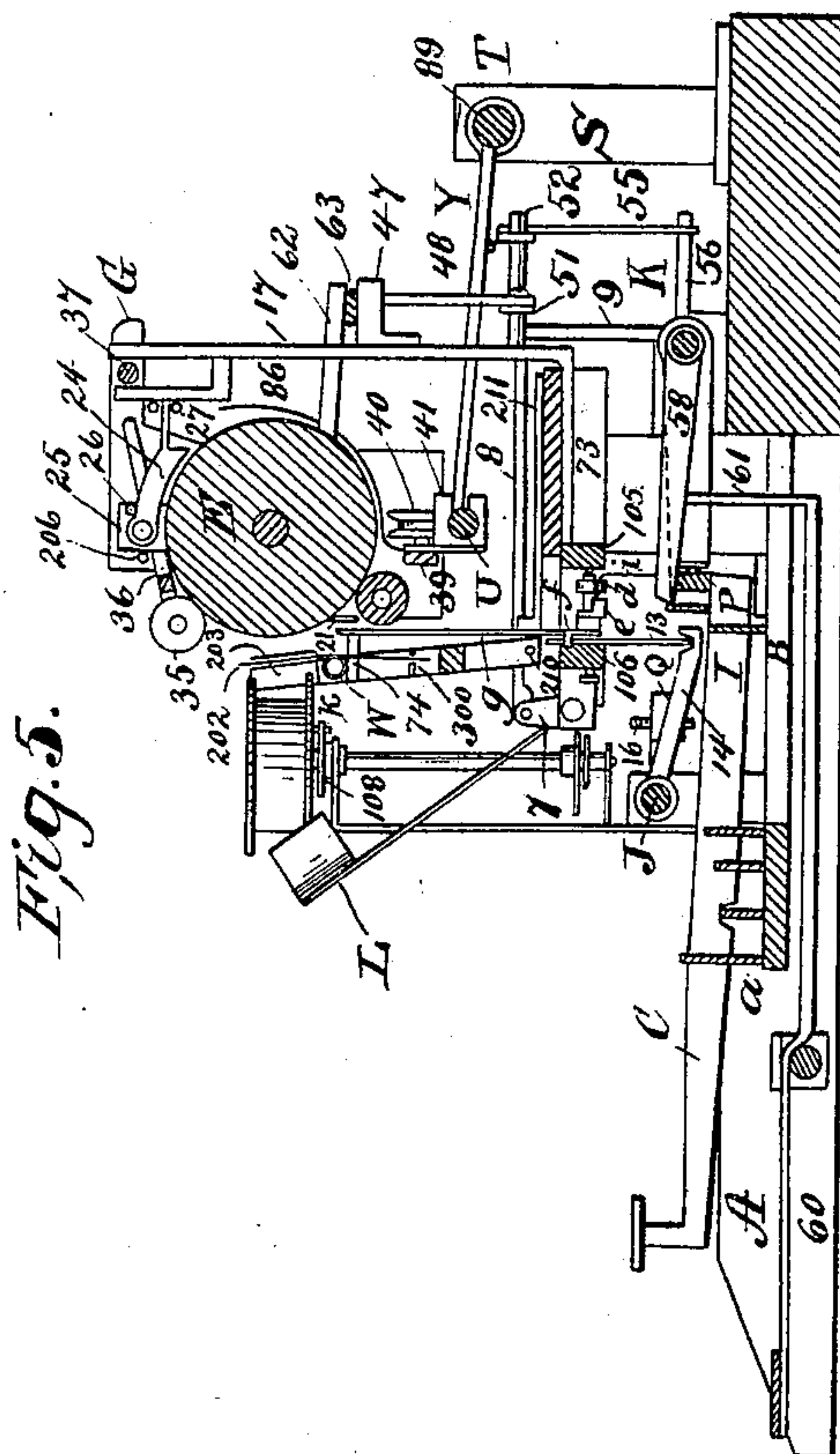
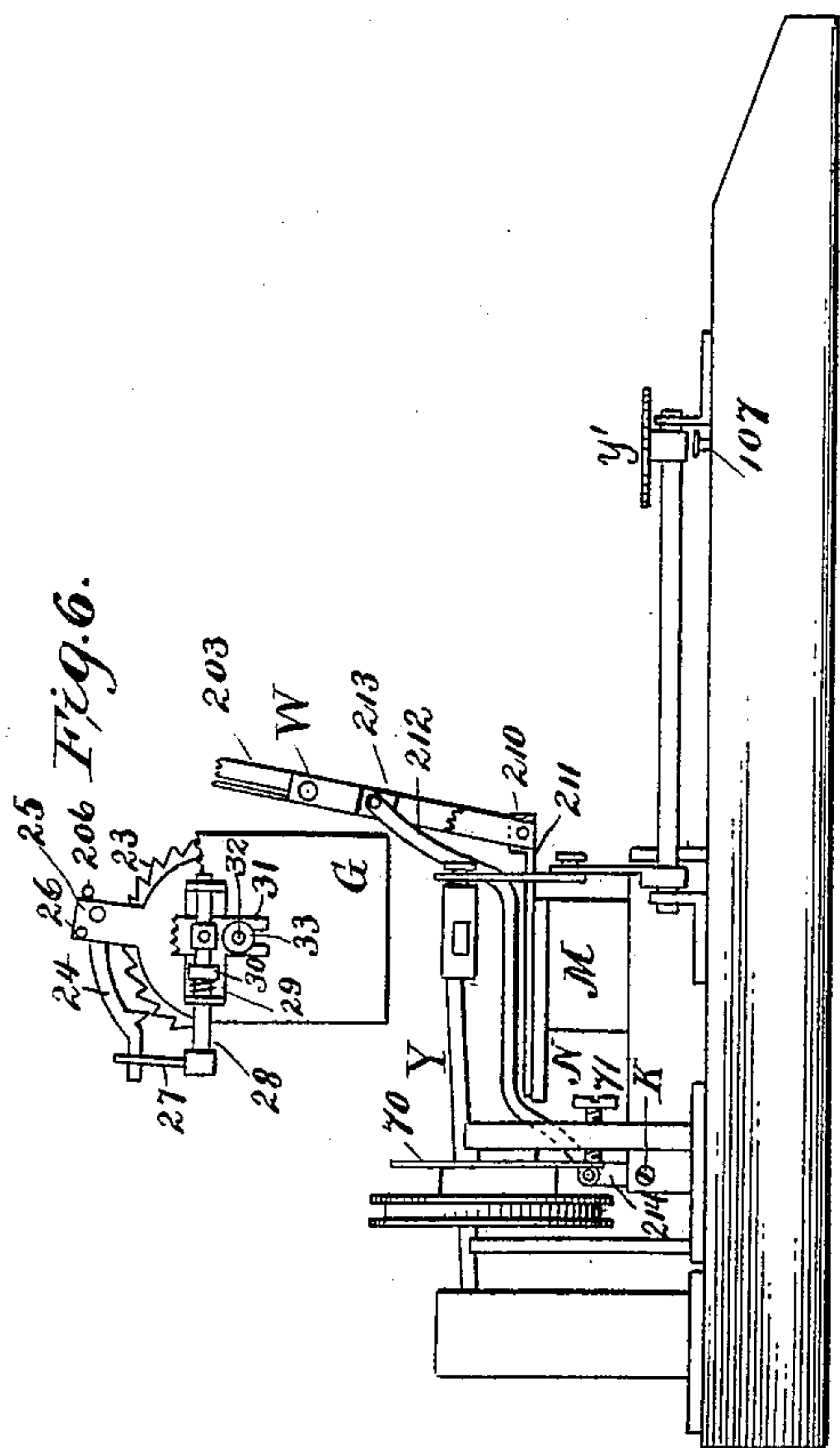


J. PRATT.  
TYPE WRITING MACHINE.

(Application filed June 20, 1895.)

(No Model.)

4 Sheets—Sheet 4.



Witnesses:-  
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# UNITED STATES PATENT OFFICE.

JOHN PRATT, OF NEW YORK, N. Y., ASSIGNOR TO THE HAMMOND TYPE-WRITER COMPANY, OF SAME PLACE.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 620,960, dated March 14, 1899.

Application filed June 20, 1895. Serial No. 553,460. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN PRATT, a citizen of the United States, residing at New York, (Brooklyn,) in the county of Kings and State of New York, have invented a new and useful Type-Writing Machine, of which the following is a specification.

My invention relates to improvements in type-writing machines of the class in which all the types are in one type-carrier, and more especially in the line of my United States and English patents of 1868 and 1869, respectively.

The objects of my improvements are speed, accuracy, uniform touch for all the keys, manifold, and simplicity, cheapness, and durability of construction. I attain these objects by the mechanism illustrated in the accompanying drawings, of which—

Figure 1 is a plan of the entire machine; Fig. 2, a plan of the machine with paper-carriage, spools, and type-plate removed; Fig. 3, a vertical lateral section of the machine along the line  $x x'$  of plan 1; Fig. 4, a rear elevation of same; Fig. 5, a vertical longitudinal section along the line  $y y'$  of plan 1; Fig. 6, a partial longitudinal elevation of left side of machine; Fig. 7, a rear view of stop-plate and guide; Fig. 8, a view of stop-plate and stop-arms in contact; Fig. 9, a view of type-plate, and Fig. 10 of reversing mechanism.

Similar letters and numerals refer to like parts throughout the several views.

A is a wooden case, to which is secured the metal base-frame B, to which is fixed all the mechanism except some parts relating to feed. Bar N is secured to standards M.

The types are arranged in horizontal rows on the face of a rectangular plate D, which may be of thin metal or of celluloid, parchment, or similar substance, and in case of metal may be stamped thereon or formed of electros. In case celluloid is used the type is preferably of rubber and may be slit at the lower end to receive the margin of celluloid and secured with cement, as shown at 19, Fig. 9. The types are slit apart in vertical rows of three each, preferably, and are arranged, preferably, with the lower case in the

upper row, capitals in the middle, and the figures and other signs in the lowermost row.

The separation of the type triplets is intended to secure the clean impression, especially in manifold, of the separate types, free from smudgings of adjacent types, and the plate is made flexible in order that each slat when struck by the hammer may be driven a little beyond the vertical plane of the type-plate. In order that the work may be seen as done, the type-plate is set about a quarter-inch from the platen and is moved nearly in contact with the platen before impressed, as shown hereinafter.

The type-plate is curved at each end into short cylinders, through which passes a guide-rod W, on which it slides laterally. This rod rests in holes in the upper ends of the sides  $x$  of an H-shaped frame  $x 102$ , where it is confined by the thin strips 202 203, made flexible, so that the rod, and with it the type, may be instantly removed for cleaning. The type-plate has a prolongation which enters a slot 300 in a plate 201, by which it is held in a vertical position. This prolongation is slotted at 2 and forms a yoke to receive a pin 74, fixed in the upper end of arm  $g$ , forming a prolongation of stop-arms  $f$  and secured therewith to hub 82 of shaft  $c$ , pivoted in bars 105 106, framed into bars 73, secured to bar N. On the obverse face of said hub is fixed driver-arms  $e$ , formed, like the stop-arms, of one piece. Driver-levers I, journaled on brackets O, secured to standards M, traverse over the key-levers, nearly meeting at the middle of keyboard. These driver-levers oscillate the shaft  $c$  and arm  $g$ , the one to the right and the other to the left, and by means of the pin 74 move type-plate to and fro on its guide-rod, the slot in type-plate permitting the circular movement of the pin. The nearer a given key-lever is to the fulcrum of its driver-lever the greater its movement, and it is the relative position of these that determines the degree of movement of a given type. A little over half the movement of the driver-levers is waste in order that either one may be in position to operate its driver-arm from the extreme limit of its previous movement, for if a given lever rested normally immediately



under its driver-arm the type-plate would have to return to its initial position before the next key could be struck. So machines of this class have the driver initially out of the field of movement of the driver-arms or gear-arms, as the case may be; otherwise the movement would be locked both right and left, and to allow the type-bearer to return to its initial position the previously-struck key must be allowed to rise to its initial position, and this takes time.

The reversing mechanism consists of a lug *i*, which is a light three-sided rectangular frame pivoted to frame-lever K P and having the upper ends of its fingers bent over the reversing-arms *d*, mounted on the shaft *c*. When the said frame-lever is lifted by a key-lever, the type-plate is freed from any resistance, but when the lever drops back to its place the lug reverses it to initial position. The novelty of this reversing mechanism is that no special reversing-spring is employed as in all other machines of this class, and the key-touch, as regards this movement, is substantially the same for all the key-levers. It is the weight of P in the frame that does this work while reversing the escapement and hammer, as shown hereinafter.

The mechanism for stopping the type-plate at the impression position consists of frame-lever J Q, consisting of shaft J, side arms 15, a wooden bar Q, having regulator-screws 16 therein, a middle arm 14, and a stop-frame 13, resting in a notch of arm 14. Said frame 13 is slotted and guided by a projection 209 on bar 106. (See Fig. 7.) Frame 13 is flanged on both sides, as shown, and one or the other of said flanges moves counter to its stop-arm and opposes and stops its downward movement and so stops type-plate. Frame-lever J Q is centered in standards R. The degree of its movement is regulated by adjusting-pins 16, and that movement is greater in proportion as the movement of a driver-lever is less. The regulator-screws are severally set over a corresponding key-lever and the nearer a screw in initial position is to its key-lever the sooner, therefore, said key-lever will operate the frame-lever J Q and the sooner the latter stops the type-plate. The adjusting-screws may be set in the key-levers instead of the frame-lever. Usually the driver-levers operate as such; but in very rapid manipulation it often happens that the stop-lever acts as the driver-lever and the driver-lever as the stop-lever, for in such case the key-lever acts before the reversing-lug has time to return type-plate to initial position, and then the type-plate, instead of moving as usual to the left—*e. g.*, when impelled by a right-hand driver-lever—moves to the right from a previous longer movement in the opposite direction. Properly, therefore, the driver-levers should be named "driver stop-levers" and the stop-levers "stop driver-levers" from their double function, and so of their adjuncts, and I shall so designate them in the claims. I dwell on

this as a novel feature of this invention, since in all other machines of this class the right-hand and left-hand series of key-levers impart motion only in one direction and the reversing-spring and mechanism is indispensable, the machine being inoperative without it. In this the reversing-lug is not necessary, but is used only as a subsidiary device, the mechanism in many positions moving the type from the last preceding position, and in all cases may do so. All this tends to increment of speed.

The paper-carriage consists of two end plates G, framed together by bar 39, guide-rod 37, bail 94, large roller E, pressed in contact with small roller F, and axled in said plates. Other parts thereof are paper-guide scroll 86, secured to bar 39 by brackets 41, antifriction-rollers 40, axled on said bar 39, presser-roller frame 36, carrying rollers 35, and a guide-plate 21, consisting of thin sheet metal stretched between end plates just above small roller. Other parts will be described in showing interlinear mechanism. The paper is introduced between large roller and scroll 86, which guides the upper margin to the lips of the rollers. Large roller is then rotated and the paper moves in contact with guide 21 and then presser-roller frame is lifted and dropped upon it to hold it smoothly against the large roller.

The carriage-way frame consists of a swing-shaft T and a rail U, riveted together by arms Y. The rollers 40 travel on rail U, being secured thereto by brackets 41, which are perforated so as to slide on said rail. These perforations are open, as shown, to allow the arms Y to pass through. Shaft T is pivoted to standards S, and the frame is held in initial position by spiral spring 89. A set-screw collar 42 stops carriage at any desired point by coming in contact with one of brackets 41.

The carriage is supported vertically by a vertical slot in standard 17, wherein rod 37 moves laterally for line-feed and vertically, as will hereinafter be described, for another purpose.

The line-feed mechanism consists of the ratchet-bar 63, secured to swing-frame 62, hinged to end plates G at 64, having a perforated projection 65 for fastening pulley-cord, pulley-wheel V, journaled in standards 68 and operated by spring tensioned by disk 70 and screw 71, pressing against same. The swing-frame is hinged to paper-carriage so as to allow the feed to be operated at any vertical position of the carriage. The feed is accomplished by means of escapement mechanism geared with ratchet-bar. This consists of the frame-lever K P, operated by all the key-levers severally, arm 56, secured to a sleeve 57, mounted on shaft K and geared with a hanger 55, pivoted to arm 51, mounted on shaft 52, stepped in standard 17. The sleeve has also an arm 58 resting on bar P of lever K P. Sleeve 57 fits shaft K loosely and may be operated independently, but since



arm 58 rests on P is also actuated by said lever K P. Secured to standard 17 is a bracket 47, having two notches in which reciprocate detents 50 and 48, pivoted to arm 51 on opposite sides of shaft 52, whereon said arm oscillates. Initially detent 48 is geared with the ratchet through nib 49, its slot in bracket 47 allowing lateral play corresponding to the distance of one escapement movement. Spring 97, connecting the two detents, causes detent 48 to resume initial position after retraction from ratchet-bar. Detent 48 has a nib 49 pivoted thereto, which allows the ratchet free reverse movement when the carriage is pushed back for a fresh line of print. The reverse movement of escapement is made by weight of bar P. The large forward movement of carriage is made by lifting swing-frame 62. Space-key lever 60 has an upward limb 61 which rests against arm 58, mounted, as has been said, on sleeve 57. The space-key through these parts actuates the escapement independently of the lever K P without moving it and without disturbing the impression mechanism. Spring 115 reverses the arm 58, and so the escapement for spaces, being tensioned by collar 116 just enough for this, but not enough to lift lever K P.

The page-feed mechanism consists of ratchet-wheel 23, secured to end of roller E, pawl 24, hinged on arm 25, which is a prolongation of a disk, a slotted lever-arm 27, straddling said pawl, a shaft 28, whereon is mounted said arm, a reversing-spring 29, tensioned by set-screw collar 30, a thumb-plate 31, slotted at its lower end to receive an adjusting-screw pin 32, stepped in end plate of carriage and bearing an adjusting-nut 33; also, of friction-washer 87 and collar 88. Initially the pawl is lifted by spring 29 out of engagement with the ratchet-wheel, so that the large roll may be revolved either way freely without lifting a latch. A pin 26 on arm 25 limits the movement of pawl and causes 25 to move with it. The reverse movement of arm 25 is limited by a pin 206, fixed in end plate G. The page-feed is operated by pressing the thumb-plate in pushing back the carriage. This brings the pawl into gear with the ratchet-wheel, because the friction of the arm 25 against the friction-washer is greater than the friction of the pawl in its bearing. Then the roller E is moved a distance determined by the adjusting-nut 33.

The impression mechanism consists of a hammer L, having the face vertically prolonged to cover the field of impression, connecting-rod 8, geared with arm 7 on end of hammer-shaft and with arm 9 on shaft K of lever K P. Since it is difficult to time the hammer-stroke so as to follow and not precede the stop of the type-plate, I employ a mechanism to slightly delay the stroke. This consists of mounting arm 9 on shaft K so that it may turn freely thereon. A set-screw collar has a pin 10 passing behind arm 9. A spring 11, tensioned by set-screw collar 12,

presses arm 9 against pin 10. Now when a key is struck the arm 9 propels the hammer through the resistance of the spring, which yields the more in proportion to the suddenness of the stroke. The resistance of the spring is regulated by the tension-collar. The hammer-shaft is journaled in projections of bars 73.

In its initial vertical position the paper-carriage is so adjusted that the upper part of the hammer-face strikes the outer row of types against the large roller. Since the type-plate cannot be raised to bring the supplementary type rows into the field of impression without changing the relative positions of the type moving and stopping mechanism, it is necessary to lower the paper-carriage. The mechanism for this purpose consists of the carriage-way frame, already described, arm 100 on the left end of rail U, hangers 45 and 46, secured to shaft 72 and forming therewith a toggle-joint, shifting-keys  $y y'$ , fixed to said shaft and having their motions regulated and limited by adjusting-screws 107. A pressure on either key lowers the carriage by flexing the joint. If the right-hand key is pressed, the screw on that side stops the platen at the capitals' row of type. If the left-hand key is pressed, its screw stops it at figures and signs. Reversing-spring 89 brings back the carriage to initial position. During this vertical movement of the paper-carriage the ratchet bar or rack 63, secured to swing-frame 62, rests on bracket 47, while only its hinge connection with paper-carriage shifts therewith. Guide-rod 37 descends in slot of bar 17.

The ribbon is wound on spools  $p$  and feeds from one to the other. The spools are mounted on shafts  $r$ , the spool on the right hand turning on but not with it. That on the left-hand shaft is geared therewith by means of a pin  $k$  and a disk 108, having perforations to receive it. The feed consists of an ordinary ratchet-wheel  $s$ , pawl  $t$ , pawl-lever  $u$ , connecting-rod 103, hinged to lever  $u$ , and arm 104 of shaft K. The lift of frame-lever K P operates the feed. The spools have each a pin  $k$  on obverse sides, and the ribbon is reversed by interchanging spools, which has the advantage of presenting a fresh margin thereof and increasing its durability. The spools are fitted loosely on the shaft, so as to be easily lifted off to renew ribbon.

Normally, as has been said, the type-plate is held some distance from the platen, but it is moved nearly in contact therewith before the hammer strikes it. For this purpose the H-frame, consisting of two uprights  $x$ , framed by cross-bar 102, is hinged at 210 to brackets 211, secured to bar N. A connecting-rod 212 is pivoted to a boss 213 on said upright  $x$  and also to an arm 214 on shaft K. Shaft K moves the said frame and the type-plate simultaneously with the hammer. The frame P, shaft K, and arm 214 constitute a bell-crank lever for operating the H-frame through the link 212. The ribbon 202, guided and sup-



ported by slits in the plates 203 terminating uprights  $x$ , is moved to and fro with type-plate, so that the last letter of line of print may be seen after each impression.

5 The key-levers operating all rest in the slots in the plates  $a$  on fulcra at the bottom of slots cut shallow where used as fulcra or else on separate fulcra  $b$ , according to what bank a  
10 given key may belong to. There are preferably four banks of keys with fulcra so arranged as to equalize leverage.

Having thus described my invention and the mode of operating the same, I claim—

1. In a type-writer, the combination with  
15 the platen, of a type-plate having the type arranged on the side nearest the platen, a pivoted frame supporting said plate in front of the platen, a bell-crank rock-lever having one arm bearing upon the key-levers, and adapted  
20 to be operated by the same, and a link pivoted to the opposite arm of said lever and to said frame respectively, whereby the frame and plate are rocked toward and away from the platen, as set forth.

25 2. In a type-writer, the combination with the platen, of a type-plate having the type arranged on the side nearest the platen, a pivoted frame supporting said plate in front of the platen, a rock-lever adapted to be oper-  
30 ated by the key-levers, a link connecting said frame and rock-lever, the hammer having its striking-face in front of the type-plate, and its operating-arm connected with the shaft of the rock-lever, all as set forth.

35 3. In a type-writer, the combination with the platen, of the flat type-plate having the type arranged on the side nearest the platen, a pivoted frame supporting said plate in front of the platen, and a support in said frame  
40 and between the plate and the platen for the inking-ribbon, a bell-crank rock-lever having one arm bearing upon the key-levers and adapted to be operated by the same, and a link pivoted to the opposite arm of said lever,  
45 and to said frame respectively, all as set forth.

4. In a type-writer, the combination with the platen, of a type-plate having the type arranged on the side nearest the platen, and supported on a pivoted frame in front of the  
50 platen, a rock-lever adapted to operate said frame, and be operated by the key-levers, the hammer having its striking-face in front of the type-plate, a spring secured to the rock-lever and bearing upon the hammer-operat-  
55 ing arm, all as and for the purposes set forth.

5. In a type-writer, the combination with the type-plate supported loosely on a horizontal guide, and having a downwardly-projecting yoke, a driver-lever having its two arms  
60 extending laterally on opposite sides of its fulcrum, and having an upwardly-extending arm engaging with the yoke of the type-plate, two sets of key-levers and intermediate mechanism whereby the operation of said two sets  
65 of levers will cause the two driver-arms to raise respectively and slide the type-plate laterally in both directions, all as set forth.

6. In a type-writer, the combination with the type-plate supported loosely on a horizontal guide and having a downwardly-projecting yoke, a driver-lever having its two arms extending laterally on opposite sides of its fulcrum, and having an upwardly-extending arm engaging with the yoke of the type-plate, two sets of key-levers and intermediate  
75 mechanism for raising the two driver-arms respectively and limiting the movement of the descending arm, all as set forth.

7. In a type-writer, the combination with the type-plate supported loosely on a horizontal guide and having a downwardly-projecting yoke, a driver and a stop-lever both having their arms extending laterally on opposite sides of its fulcrum, an arm extending upward from said levers and engaging with  
85 the yoke of the type-plate, two sets of key-levers, and intermediate mechanism for raising the two driver-arms respectively, and mechanism for stopping the movement of the descending stop-arm, all as and for the purposes set forth.

8. In a type-writer, the combination with the type-plate supported loosely on a horizontal guide and having a downwardly-projecting yoke, a driver and a stop-lever both having their arms extending laterally on opposite  
95 sides of its fulcrum, an arm extending upward from said levers and engaging with the yoke of the type-plate, two sets of key-levers and intermediate mechanism for raising the two driver-arms respectively, and a vertically-movable frame raised by the action of the key-levers for coming in contact with one of the descending stop-arms and thus limiting its descent, all as and for the purposes set forth.

9. In a type-writer, the combination with the type-plate supported loosely on a horizontal guide and having a downwardly-projecting yoke, a driven lever having its two arms extending on opposite sides of its fulcrum, and  
110 having an upwardly-extending arm engaging with the yoke of the type-plate, two sets of key-levers, two transverse arms pivoted to the machine-frame, and extending over the two sets of type-levers respectively, and said two arms adapted to raise the two driver-arms respectively, all as and for the purposes set forth.

10. In a type-writer, the combination with the type-plate supported loosely on a horizontal guide and having a downwardly-projecting yoke, a rocking lever having its two arms extending on opposite sides of its fulcrum, and  
120 having an upwardly-extending arm engaging with the yoke of the type-plate, a frame adapted to be raised and depressed by the key-levers, and having two vertical arms with bent ends overlapping the two rocking arms respectively, all as and for the purposes set forth.

11. In a type-writer, the paper-carriage, in combination with a spring swing-frame supporting said carriage and the action of the spring tending to force the frame upward, a toggle-joint the upper arm of which is connected with said carriage, the lower arm be-



ing secured to a rock-shaft, a rock-lever on said shaft, and stops arranged at different heights under the two arms of the lever respectively, all as and for the purposes set forth.

5 12. In combination with the two ribbon-spools, revoluble shafts for said spools, one shaft being provided with a disk having transverse perforations, and both spools having pins for engaging respectively with any of said  
10 perforations, a ratchet fixed to the disk-shaft, a pawl for engaging said ratchet, an operating-lever, and a link connecting said lever and pawl, all as set forth.

13. A type-plate for a type-writer, consisting of a series of rubber or other flexible strips 15 having the type upon one side, and said strips arranged side by side, and attached to a longitudinal strip of celluloid or similar material, by slits and cement, and a rigid connection with said strip, whereby the plate may be 20 moved operatively on the machine, all as set forth.

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