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J. FELBEL.
TYPE WRITING MACHINE.
APPLICATION FILED APR. 7, 1908.

Patented July 4, 1911.

6 SHEETS-SHEET 1.

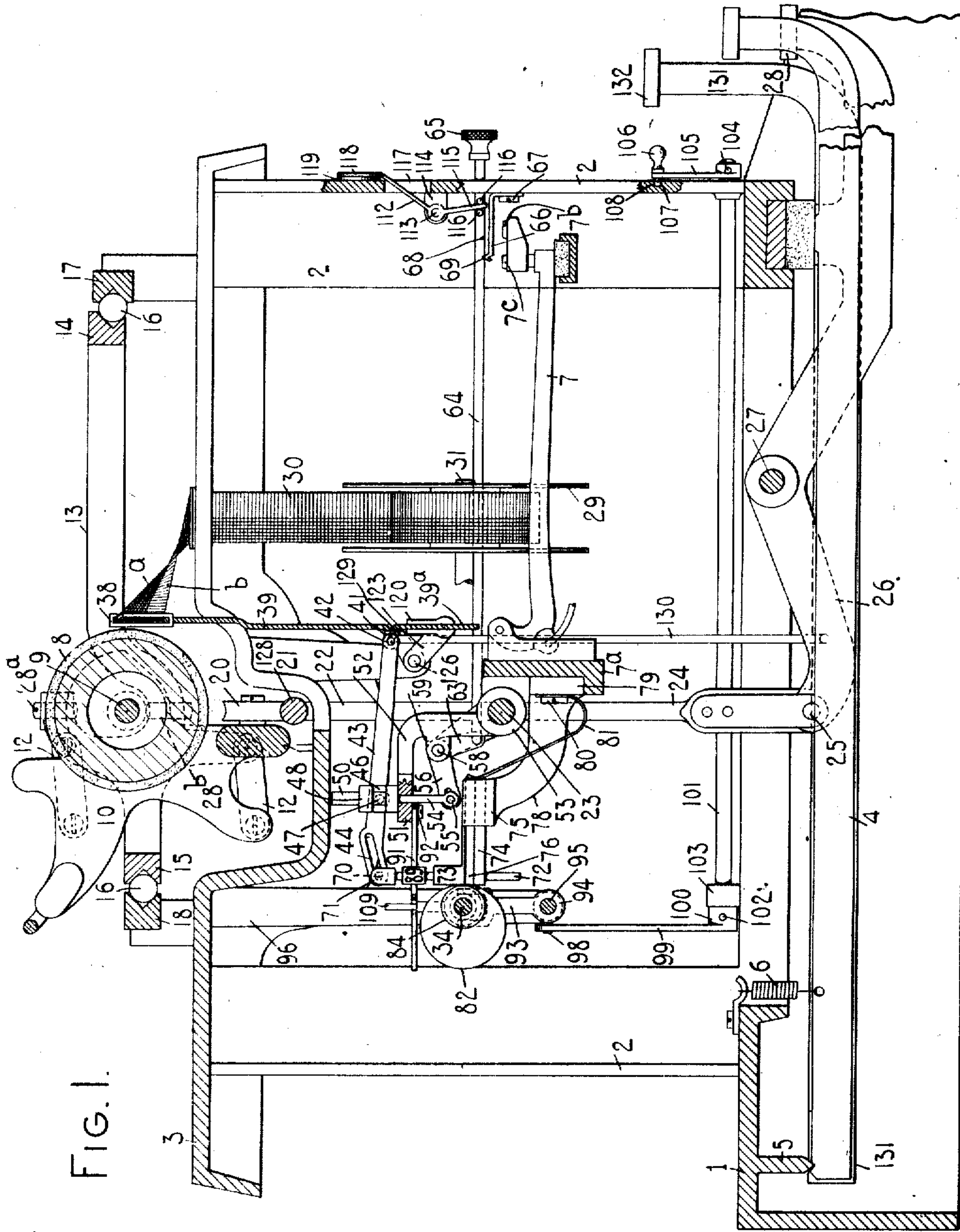


FIG. 1.

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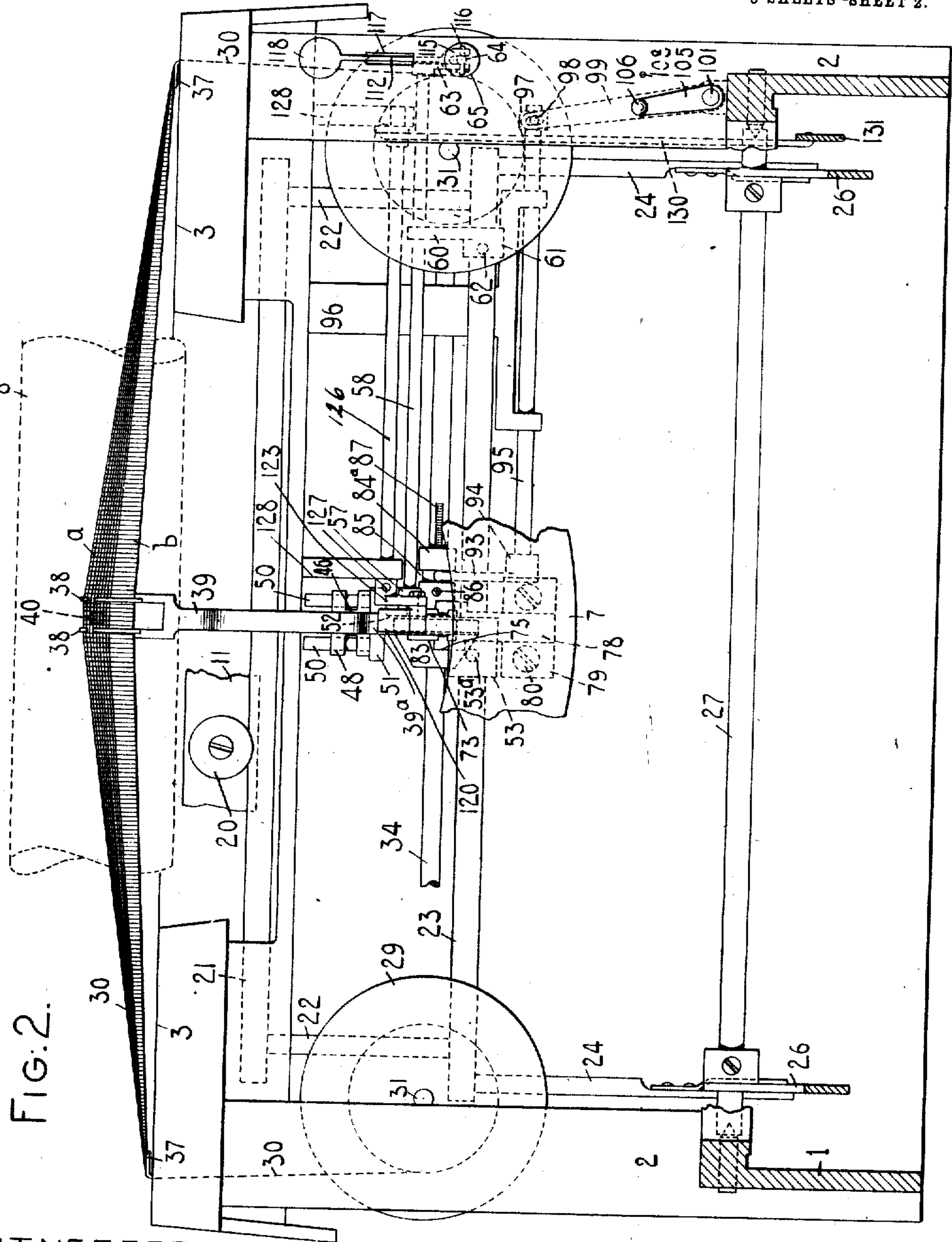
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5 SHEETS-SHEET 2.



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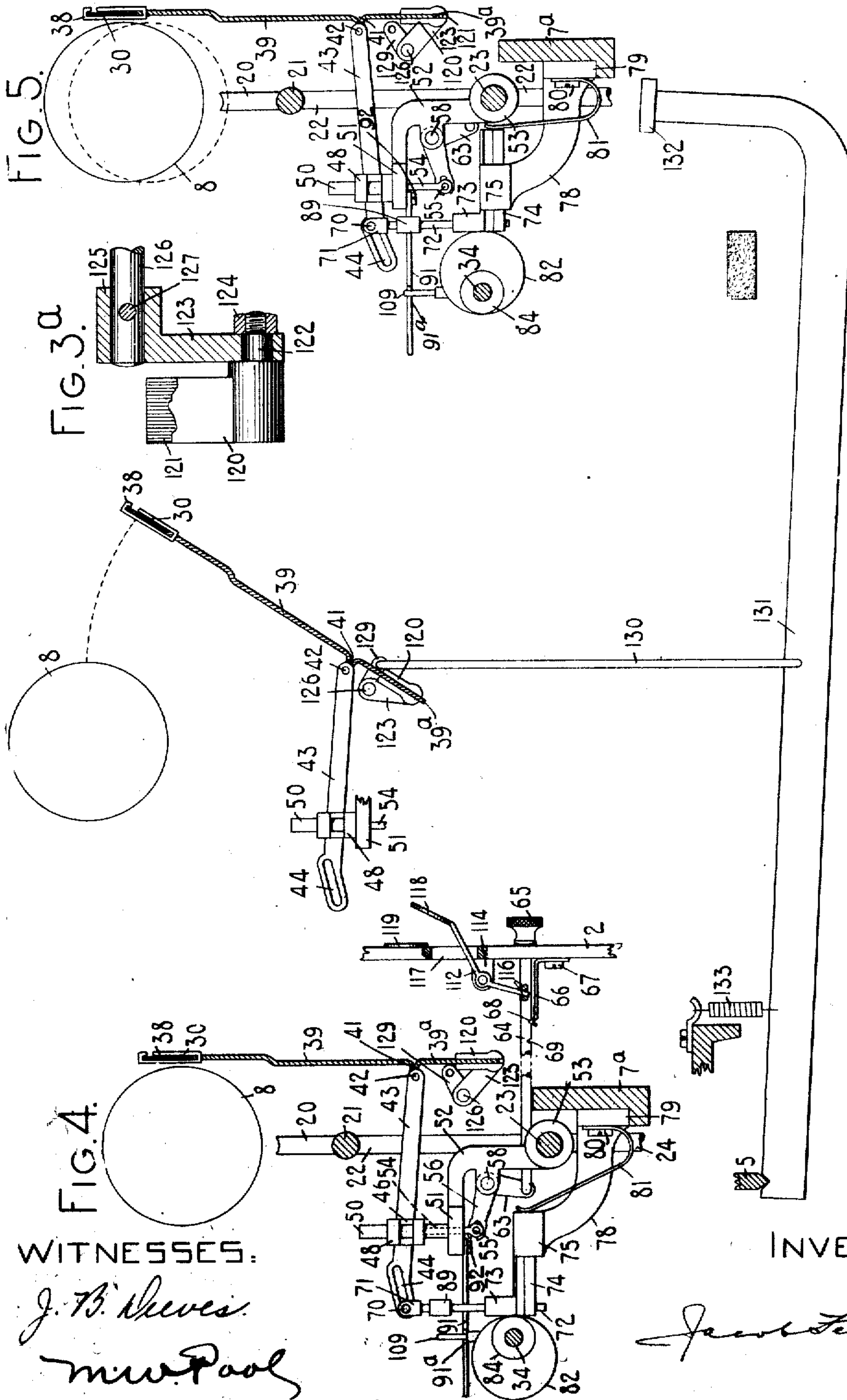
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5 SHEETS—SHEET 3.

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5 SHEETS—SHEET 4.

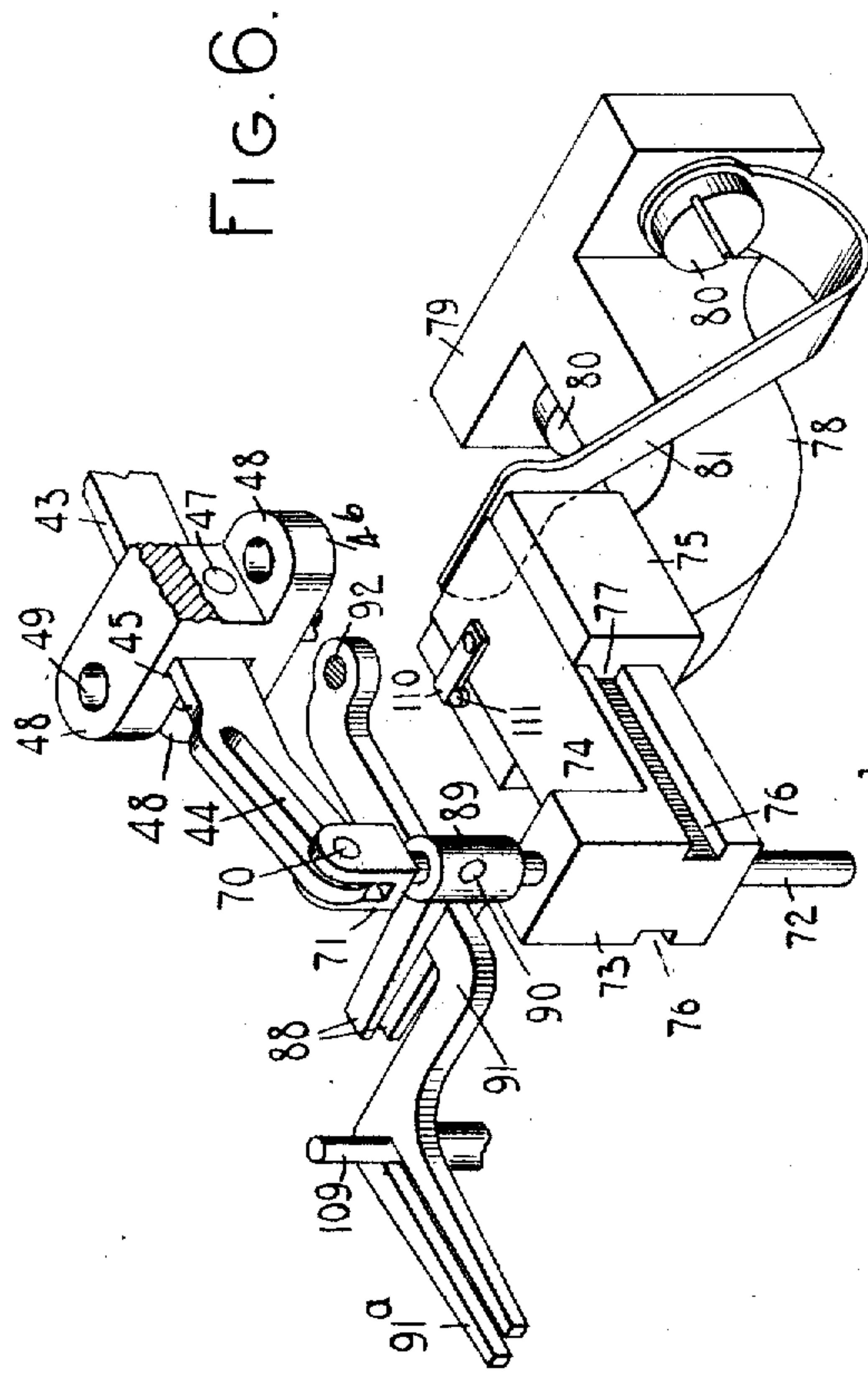


FIG. 6.

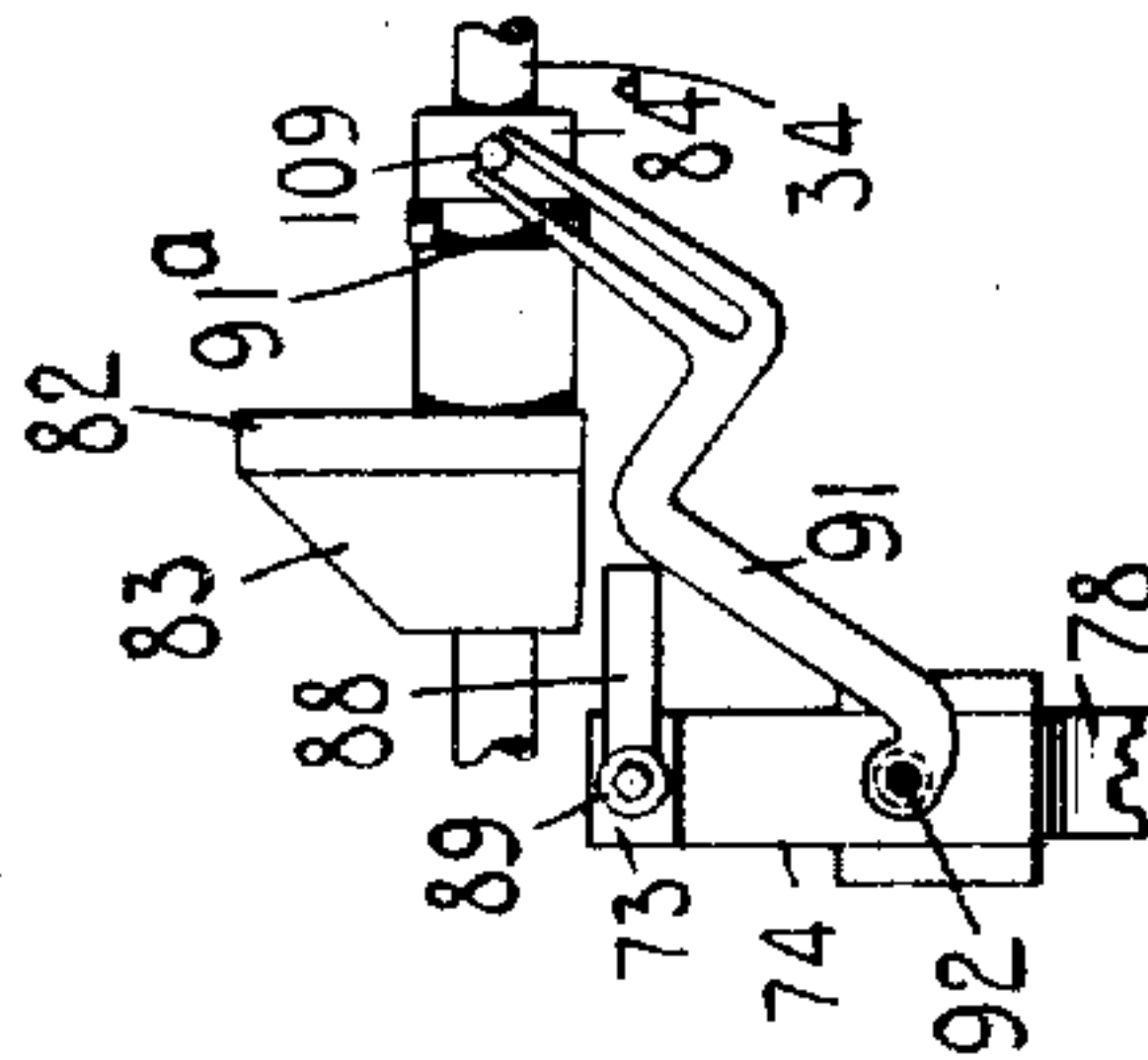


FIG. 9.

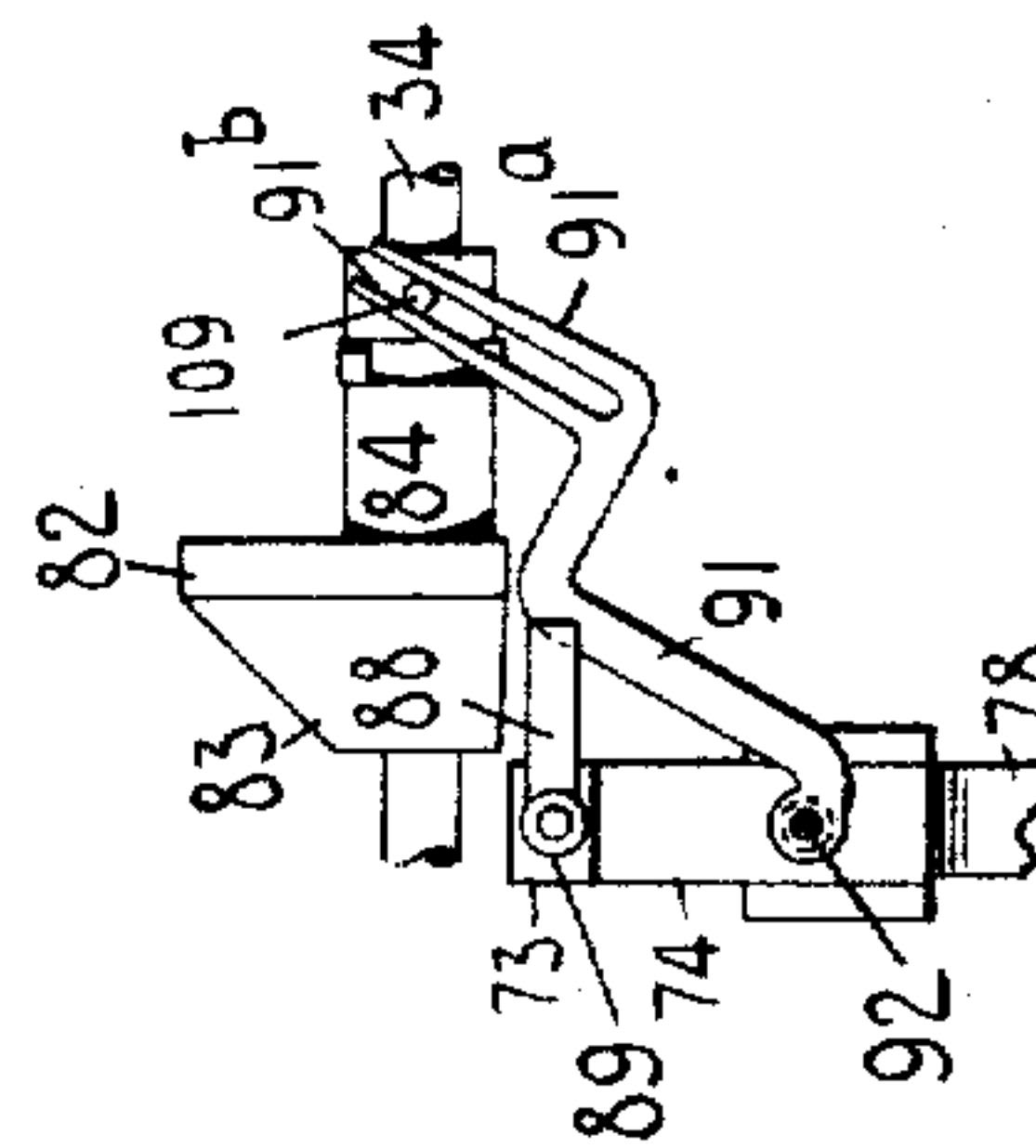


FIG. 8.

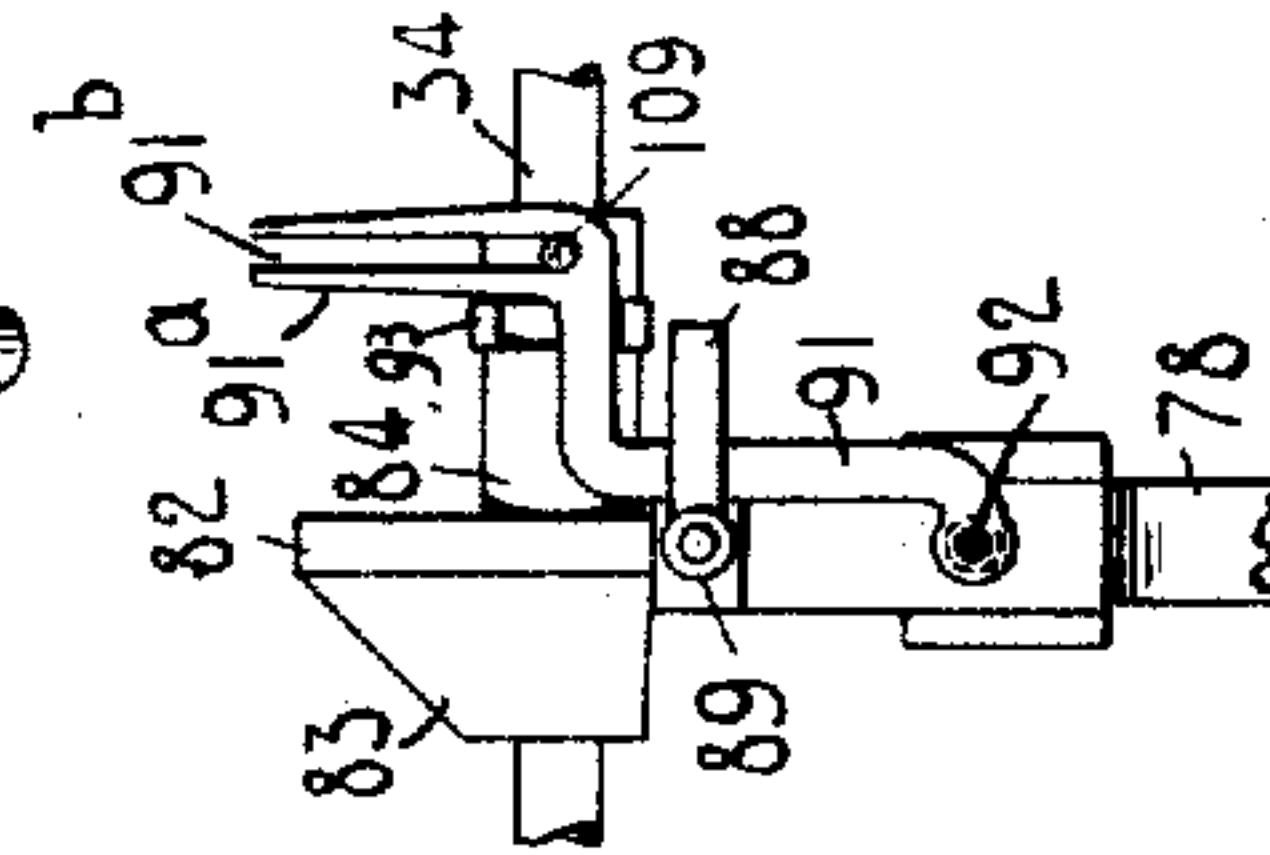


FIG. 7.

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5 SHEETS—SHEET 5.

FIG. 10.

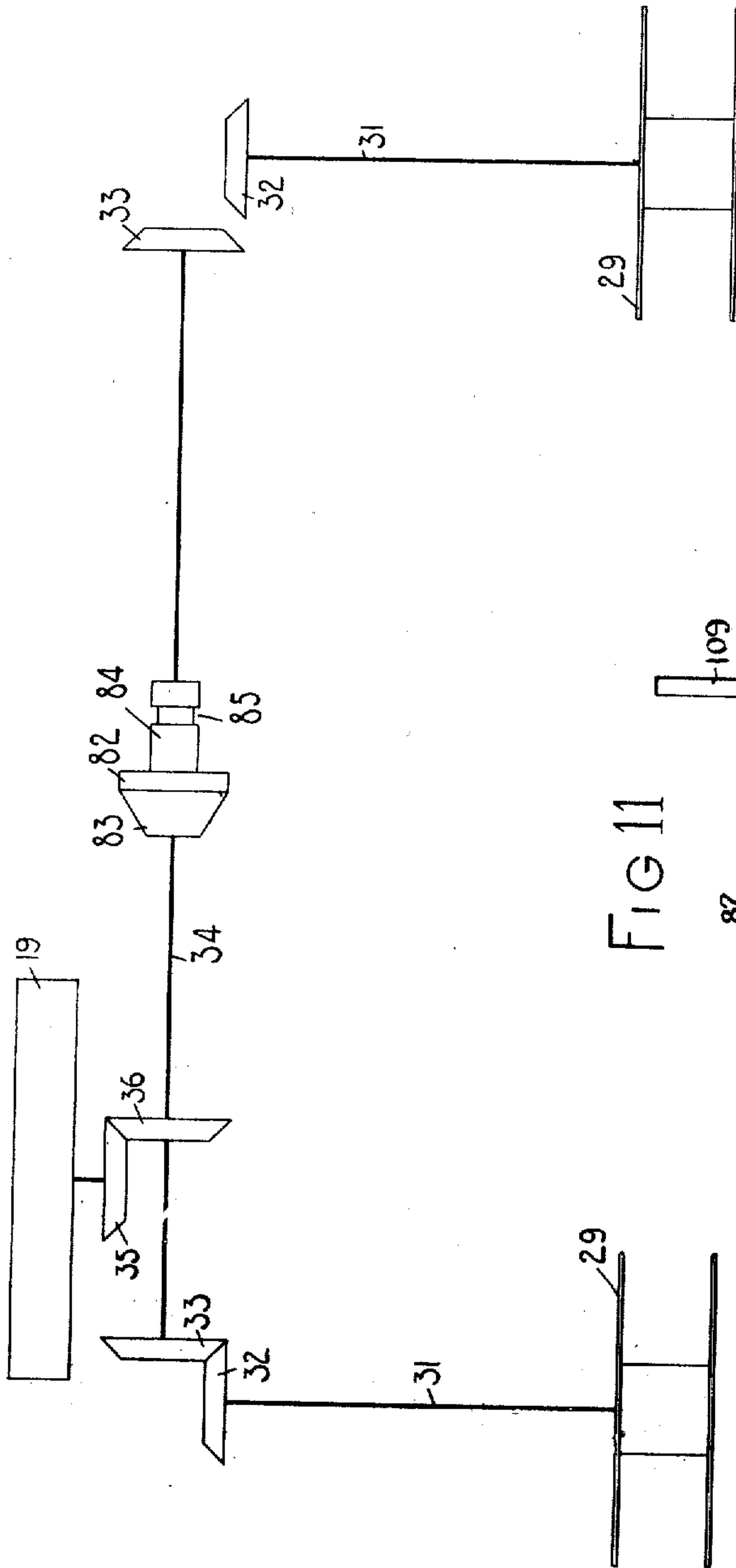
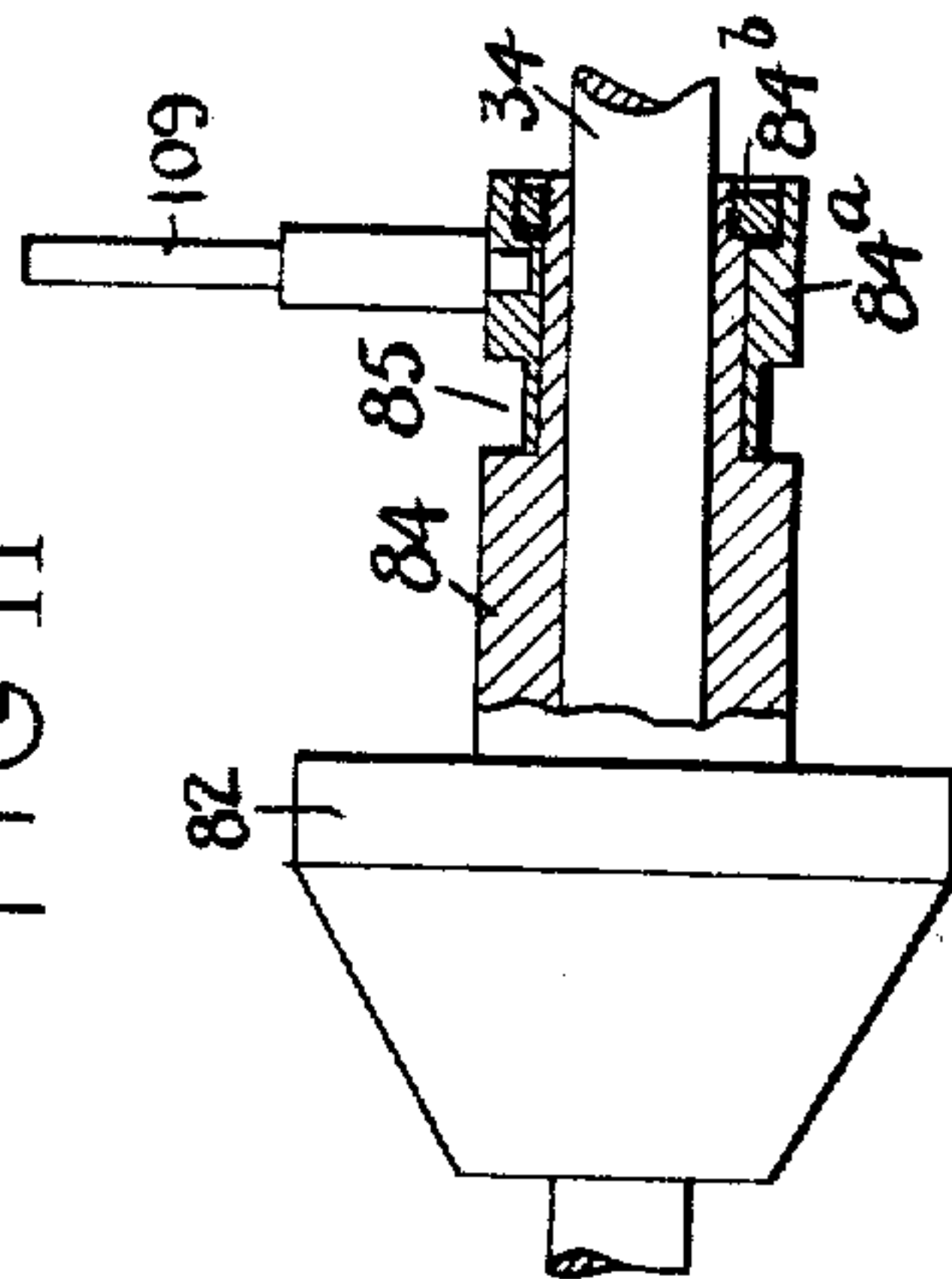


FIG 11



WITNESSES.

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UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

996,753.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed April 7, 1908. Serial No. 425,635.

To all whom it may concern:

Be it known that I, JACOB FELBEL, citizen of the United States, and resident of the borough of Manhattan, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates especially to ribbon mechanisms for typewriting machines and its object generally stated is to provide improved devices of the class specified.

To the above and other ends my invention consists in the features of construction, combinations of devices and arrangements of parts to be hereinafter described and particularly pointed out in the claims.

In the drawings, my invention is shown as applied to a front-strike typewriting machine having a shifting platen.

Said invention comprises in the present instance a ribbon guide which normally maintains the printing portion of the ribbon opposite to or covering the printing point on the platen, said guide being shiftable with said platen and being movable by key operated means to withdraw the printing portion of the ribbon from the platen and expose the printing point thereon. Means are also provided for automatically and progressively moving the guide back and forth transversely of the platen so as to give a crosswise feed to the ribbon, this crosswise feed coöperating with the longitudinal feed communicated to the ribbon so as to cause the types to follow a serpentine or wavy path extending lengthwise of the ribbon and substantially from one edge to the other thereof. Other means are provided to dispense at will with the crosswise feeding mechanism and to maintain the ribbon guide set in one or another of a plurality of predetermined relations with the printing point on the platen so that a ribbon may be used in one or another of a plurality of straight parallel paths extending longitudinally of said ribbon. The means last referred to is especially adapted for use with a ribbon having a plurality of fields or stripes of different characteristics, such for example as different colors. In connection with these general features of the invention I have de-

veloped various special devices which will hereinafter be described in detail.

Various features of the invention may be adapted in whole or in part to styles of writing machines other than that shown.

In the drawings, Figure 1 is a vertical front to rear sectional view of a typewriting machine embodying my invention, said section being taken about centrally of the machine, various parts of the machine being omitted and broken away. Fig. 2 is a front elevation partly in section of the machine, parts of said machine being omitted and parts broken away. Fig. 3 is a diagrammatic side view showing the mechanism for moving the ribbon guide away from the printing point on the platen, said guide being shown withdrawn therefrom. Fig. 3^a is an enlarged detail vertical sectional view of some of the parts shown in Fig. 3. Figs. 4 and 5 are side views partly in section showing different relations of various devices for controlling the ribbon guide. Fig. 6 is an enlarged perspective view showing certain of the devices for controlling the ribbon guide. Figs. 7, 8 and 9 are top plan views showing varying relations of certain of the devices for controlling the ribbon guide. Fig. 10 is a diagrammatic plan view showing the means for feeding the ribbon longitudinally. Fig. 11 is a front view, partly in vertical section, illustrating details of construction of certain of the ribbon controlling devices.

Referring first to Figs. 1 and 2, the main frame of the machine is shown as comprising a base 1, corner posts 2 and a top plate 3. Key levers 4 are fulcrumed at 5 at the rear of the base, each key lever being provided with a restoring spring 6 and being connected by devices with a type bar 7, the set of type bars being segmentally arranged on a vertically disposed segmental support 7^a, said support being suitably secured to the frame of the machine in a fixed relation therewith. Each type bar is provided with an upper case type 7^b and a lower case type 7^c, said types being adapted to coöperate with the front face of a cylindrical platen 8, the axle 9 whereof is journaled in side bars 10 of a platen frame or carrier which further comprises a cross bar 11 connecting said side bars. Links 12 connect the platen

carrier with a platen carriage which latter comprises side or end bars 13 and front and rear bars numbered respectively 14 and 15. The latter bars are grooved to cooperate with anti-friction balls 16, said balls also cooperating with grooved front and rear guide rails numbered respectively 17 and 18 and fixed to the frame of the machine above the top plate. The carriage is connected by the usual band or strap with a spring drum 19 diagrammatically shown in Fig. 10 which spring drum constantly urges the carriage leftward across the top plate. The leftward movement of the carriage is controlled by the usual or suitable letter feeding devices (not shown) which are operative by the key levers 4.

During the to and fro movements of the carriage, platen carrier and platen, a roller 20, suitably mounted on the platen carrier, cooperates with a guide rail 21 and the platen carrier and platen are maintained in a predetermined relation with the carriage. This relation will not be varied during the printing and letter feeding operations except when it is desired to change case, whereupon the platen and platen carrier are shifted or moved upward in the carriage by means operative on the guide rail 21 through a shiftable frame on which said rail is supported. Said frame comprises side rods 22 at the top of which the rail 21 is fixed, said rods being supported at their lower ends on a cross bar 23 and being movable up and down through openings in the top plate. The bar 23 is carried by supporting rods 24 which are pivotally connected at 25 with shift levers 26 one at each side of the machine, said levers being mounted on a rock shaft 27 and each being provided with a finger button 28. Shift stops 28^a and 28^b limit the shifting movements of the platen and platen carrier.

Ribbon spools 29, vertically disposed beneath the top plate one at each side of the machine and forward of the platen, carry a ribbon 30. Each ribbon spool is mounted at the front end of a horizontal shaft 31, the construction being such that the rotary ribbon carriers or ribbon spools have no bodily movement and their axial positions are unvarying. Said shaft, as shown in Fig. 10, carries at its rear end a beveled pinion 32 which is adapted to mesh with a beveled driving pinion 33 mounted on a driving or power shaft 34, the latter being journaled on a fixed part of the machine and being adapted to be moved endwise in any suitable manner to cause the driving pinions 33 to mesh alternately with their cooperating pinions 32. The power shaft 34 is connected with the spring drum 19 by a train of devices comprising constantly meshing beveled pinions 35 and 36, the pinion 35 being con-

nected with the spring drum so as to rotate with the latter when it turns to draw the carriage in printing direction while the pinion 36 is so connected with the shaft 34 that it communicates rotary movement to the latter but permits said shaft to move independently in longitudinal direction, all as common heretofore in the Remington No. 6 machine.

The devices above described or other suitable devices may be employed to cause the spools to turn alternately to wind the ribbon thereon and feed it back and forth in longitudinal direction.

The parts hereinbefore described were not invented by me and are not claimed herein, save in combination with other devices of my own invention. It is not therefore deemed necessary to describe the before mentioned parts in any greater detail.

The ribbon passes upward from the spools through openings in the top plate over fixed curved plates 37 which assist to turn or direct said ribbon inward toward the middle of the machine. Midway between the plates 37 the ribbon is threaded through a ribbon guide which comprises a pair of wires 38 bent to form slot ways for the ribbon and secured by soldering or otherwise at the top of the body portion 39 of said guide, said body portion being formed preferably of sheet metal and terminating at the top in a bifurcated or forked portion, the wires 38 being fixed at the tops of the forks forming the bifurcation.

Referring to Figs. 1 and 2 it will be seen that the ribbon guide maintains the printing portion of the ribbon or that portion between the slot ways in said guide close to and covering the printing point on the platen, said printing point being represented by the dotted-line rectangle 40; that the ribbon extends downward and forward from said guide at both sides thereof toward the plates 37; and that the guide is so arranged that the left-hand guide wire 38 is nearer the printing point than the right-hand guide wire. The construction is such that while the printing portion of the ribbon normally covers the printing point, nevertheless, only comparatively few of the characters are covered or concealed from view by the ribbon guide. From some aspects of the invention, however, the ribbon guide need not be arranged so that the ribbon normally covers the printing point. The ribbon guide extends vertically downward from the front face of the platen and is provided with a crimp or rearward bend 41 which is formed with a vertical slot and carries a cross pin 42, the latter being pivotally connected with the forward end of a horizontally disposed operating lever 43, the rear end portion of which is formed with an inclined slot way 44. Said operat-

ing lever, as shown in Fig. 6, passes through a vertical slot 45 formed within a slidable block 46 in which the operating lever is pivoted on a fulcrum pin 47. The fulcrum block 46 is provided with laterally extending ears 48, two at each side of the operating lever, said ears being formed with cylindrical holes 49 which receive vertically disposed standards or guide pins 50 fixed to and rising from a horizontally disposed shelf-like part 51 formed at the rear of the horizontally disposed arm of an angular bracket or support 52, said bracket having a vertically disposed arm terminating in an enlargement or hub 53 which surrounds and is suitably secured to the cross bar or rod 23 of the platen shift frame as by a set screw 53^a (Figs. 1 and 2).

As stated the fulcrum block 46 is adapted to rest on the shelf-like part 51, the block being provided with a downwardly extending stem 54 which passes through an opening in the part 51 and at its lower end has a lateral pin 55, said pin cooperating with a slot formed in a substantially horizontally disposed crank arm 56. The crank arm has a hub portion 57 which surrounds and is fixed to the inner end portion of a rock shaft 58. Said rock shaft is journaled at its inner end near the middle of the machine in a lug 59 which is integral with and extends rearward from the vertical arm of the bracket 52. As shown in Fig. 2 the rock shaft 58 extends laterally rightward toward the side of the machine and bears in an arm 60 having a hub 61 which is secured by a set screw 62 to the cross rod 23. Fixed to and depending from the right-hand end portion of the rock shaft 58 at right angles to the arm 56 is a crank arm 63 which is pivotally connected at its free end with a forwardly extending and horizontally disposed slide rod 64, said slide rod passing through an opening formed in the right-hand front corner post 2 and being provided at its outer end with a push button 65.

The above described construction enables the fulcrum block 46 and the operating lever 43 supported thereon to be shifted up and down either automatically by the platen shifting mechanism or by hand independently of the platen shifting mechanism. When one of the platen shifting keys 28 is operated to elevate the platen shift frame, the angled bracket 52, which is fixed to the cross bar 23 of said shift frame, will also be elevated and will carry up with it the fulcrum block 46, supported on the shelf 51, and the operating lever and ribbon guide, so that when the platen is arrested in its shifted position the ribbon guide will have been moved sufficiently to maintain the printing portion of the ribbon in the same relation with the printing point on the platen as said printing portion had before the platen

shifting operation. The lower case position of the platen shifting frame, platen, fulcrum block, operating lever and ribbon guide is illustrated in Fig. 1 and the upper case position of these parts is shown in Fig. 5. There is, however, a difference between these two figures besides that due to the shifting of the platen, this difference being due to the crosswise feeding devices presently to be described. During the automatic up and down shifting movements of the ribbon guide with the platen, the rock shaft 58 will be moved bodily up and down, carrying with it the parts connected to it including the rod 64 which will be moved up and down idly, said rod fitting loosely enough in the corner post 2 to permit of this idle or pivotal movement.

When, for purposes presently to be explained, it is desired to shift the ribbon guide independently of the shifting movements of the platen, the finger button 65 may be pushed in, causing the crank arm 63 to turn the rock shaft 58 and raise the crank arm 56 and the stem 54, the latter operating to lift the fulcrum block 46 from the shelf or support 51, causing the operating lever 43 and the ribbon guide to be lifted so that the relation of the printing portion of the ribbon with the platen is altered, the shifted position of the parts being illustrated in Fig. 4. Any suitable means may be employed to maintain the fulcrum block and the parts carried thereon in their elevated position away from the shelf 51. The means for this purpose shown in the drawings (Figs. 1 and 4) comprises a spring detent 66 secured to the corner post by a screw 67 and cooperative at its free end with a notch 68 formed in the under side of the slide rod 64 as shown in Fig. 4. A second notch 69 behind the first notch cooperates with the detent 66 when the parts are in the non-shifted position (Fig. 1.) The inherent tension in the spring detent 66 is such that the free end thereof will remain in engagement with one or the other of the notches 68 and 69 in either the lower or upper case position of the platen. In other words, the hand operated devices for independently raising and lowering the fulcrum block, operating lever and ribbon guide may be actuated whether the platen shifting devices are in lower case or in upper case position. The purpose of providing for this independent shift of the ribbon guide will be referred to later.

The means for shifting the operating lever bodily both automatically when the platen is shifted and by hand independently of the platen shifting operation, having been set forth, the means for oscillating or turning said operating lever on its fulcrum 47 for the purpose of providing for a cross feed of the ribbon will now be described. The cross feeding means comprises an actuating pin 70 (Figs. 1 and 6) engaging the

slot 44 and carried by a fork 71 fixed at the upper end of a rod 72, said fork loosely embracing the rear end of the operating lever and the rod extending vertically downward from the fork through a vertical opening in the rear end portion 73 of a slide block, said slide block further comprising a horizontally disposed body portion 74. The slide block is slidably mounted in a bearing block 75, the body portion 74 being formed at opposite sides with longitudinal grooves or depressions 76 with which engage inwardly extending ribs or tongues 77 on the bearing block 75. The latter is preferably integral with a supporting bracket 78 which curves downward and forward from the block 75 and is provided with lateral ears 79 through which pass headed screws 80, said screws engaging in holes at the rear of the segmental support 7^a and serving to secure the bracket fixedly thereto. By this construction the slide block or member 73—74 is adapted to be slid horizontally back and forth fore and aft of the machine in a fixed path. A leaf spring 81, secured by one of the screws 80 at the rear of the associate ear 79, coöperates with the front face of the slide block and tends constantly to press it rearward on its support and to force the actuating pin 70 to the rear end of the slot 44 in the operating lever. The actuating device or actuator for the lever 43, which actuator comprises the pin 70 and rod 72, is adapted to be slid up and down through the slide block when the platen is shifted; but during crosswise feeding operations the rod 72 and the actuating pin 70 are maintained in fixed relation with the slide block by means presently to be described except when a shift of the platen occurs, in order that the actuating pin 70 may move in horizontal lines fore and aft of the machine longitudinally of the operating lever and toward and away from the fulcrum thereof, said pin traversing the inclined or cam slot way 44 to turn the operating lever on its fulcrum and raise and lower the ribbon guide. To accomplish this, means are provided for moving the slide block 73—74 forward step by step against the spring 81 and until the forward end of the slot 44 is reached by the actuating pin 70 as shown in Fig. 5, and then for permitting the compressed spring 81 to return the slide block until the pin 70 reaches the rear end of the slot 44. Said means includes an eccentric controlling member mounted on the driving shaft 34 and comprising a cylindrical portion 82, the face whereof is eccentric to the shaft 44, a cone portion 83 at the left of the portion 82 and a hub portion 84 at the right thereof, said hub portion being provided with a circumferential groove 85 formed in part by a loose collar 84^a. As shown in Fig. 11 the

hub 84 is reduced at its right-hand end portion to provide a bearing for the loose collar or sleeve 84^a, said loose collar being held in place on the hub by a nut 84^b which screws on the threaded end of the reduced portion 70 of said hub and is received in a depression in the loose collar. The hub 84 receives a screw 86, the point of which engages a groove 87 (Fig. 2) extending longitudinally of the power shaft 34, the construction being such that the eccentric controlling member is adapted to be rotated by said power shaft but may be slid lengthwise of said shaft independently thereof to cause the face 82 to operatively engage with the rear face of the slide block 73—74 or to disengage therefrom. It will be apparent that when the two faces are operatively engaged and the power shaft is turned, the slide block and the pin 70 carried thereby will be moved progressively back and forth, the extent of such movement depending upon the throw of the eccentric face, said throw in the present instance being such that the movement causes the pin 70 to traverse substantially the full length of the slot 44. The spring 81 moves the block in the opposite direction as the high part of the eccentric recedes. The slot 44 and pin 70 are so adjusted that an up and down movement of the ribbon guide across the printing face of the platen will be effected, this movement taking place step by step or progressively and being of such an extent that the types will print on the printing portion of the ribbon in a path extending substantially from one edge to the other thereof. During the forward movement of the pin 70 it acts against the lower inclined edge of the slot 44 to force the ribbon guide upward while during the rearward movement of the pin it permits the guide to be lowered by gravity. As has been stated the crosswise movement of the ribbon takes place concurrently with the lengthwise feeding movement thereof and consequently the path followed by the types will be a serpentine or wavy one. The extremes of movement of the slide block and the actuating pin 70 due to the coöperation of the eccentric member and the spring 81 are illustrated in Figs. 1 and 5. In Fig. 1 that portion of the eccentric disk 82 having the shortest radius may be assumed to be in engagement with the slide block, the result being that the spring 81 will have moved the latter to its rearmost position and the actuating pin 70 will be at the rear end of the slot 44. In Fig. 5 the disk 82 is in contact at its greatest radius with the slide block and the actuating pin 70 will be at the forward end of the slot 44. Comparing Figs. 1 and 5 it will be noted that in Fig. 1 the ribbon guide is lowered so that the upper edge portion of the ribbon is opposite the printing point on the

platen while in Fig. 5 the ribbon guide is shown elevated so that the lower edge portion of the ribbon is opposite the printing point. It is true that in Fig. 5 the platen is shown in upper case position while in Fig. 1 it is shown in lower case position; but as has been heretofore explained the shift position of the platen does not alter its relation with the ribbon guide and the printing portion of the ribbon for the ribbon guide shifts with the platen.

In order that the relation between the pin 70 and the slot 44 may not be disturbed when the slide block and operating lever are automatically shifted by the platen shifting devices, means are provided for shifting the rod 72 in the slide block automatically when the platen shift occurs. Said means comprises parallel fingers 88 (Figs. 6 to 9) integral with and extending laterally and horizontally rightward from a collar 89 fixed to the rod 72 below the fork 71 by a pin 90. Confined between the fingers 88 is a horizontally disposed angular arm 91, said arm being pivotally supported at the under side of the shelf 51 by a screw 92 (Figs. 1 and 6). The arm 91 fits loosely between the fingers 88 so that the latter may move freely lengthwise of said arm and said arm may turn on its pivot between said fingers. The construction is such that when the platen is shifted up and down and the bracket 52 is shifted therewith the arm 91 will also be shifted and through the fingers 88 will shift the rod 72 and pin 70 a corresponding extent and will maintain them in shifted position. During the up and down shifting movements of the rod 72 its relation with the slide block will be altered but the position of the latter will not be affected. Since the operating lever 43 also participates in the shifting movements of the platen, the relation of the pin 70 and the slot 44 will not be disturbed by such shifting movements. The arm 91 cooperates with the fingers 88 to guide the rod 72 and the pin 70 during the fore and aft sliding movements of the slide block on which said rod is mounted and to cause said pin 70 to travel in either one of two straight parallel horizontal paths, one of said paths being followed by the pin in lower case position and the other in upper case position.

The cross feeding mechanism above described is usually employed in connection with a ribbon of uniform character throughout and when employed with such a ribbon has the advantage of thoroughly exhausting the inked surface thereof. Sometimes there is employed a ribbon divided longitudinally into a plurality of fields or stripes of different characteristics, such for example as the ribbon 30 which has an upper field *a* of one characteristic or color and a lower field *b* of another characteristic or color. In such

a case it is usually desired to dispense with or render temporarily inoperative the crosswise feeding mechanism and to employ the hand positioning devices operative by the finger button 65 to set the ribbon guide and maintain one field or the other of the ribbon opposite the printing point.

The means employed in the present case for dispensing with the crosswise feeding devices comprises a vertical arm 93 forked at its upper end to cooperate with the groove 85 in the eccentric member (Figs. 1 and 2). Said arm has a hub 94 which fits over and is suitably secured to the inner end of a slide rod 95, the latter being supported on the arms of a bracket 96 shaped like an inverted T and depending from the top plate. The slide rod 95 extends laterally toward the right-hand side of the machine and at its outer or right-hand end is provided with a collar 97 from which extends a horizontal pin 98, said pin engaging in a longitudinal slot at the upper end of a crank arm 99. The crank arm 99 extends downward and terminates in a collar 100 which fits over the rear end of a horizontal rock shaft 101 and is fixed thereto by a pin 102. At its rear the rock shaft 101 is journaled in a bracket or lug 103 fixed to and rising from the right-hand side of the frame 1 while the forward end portion of the rock shaft passes through and bears in the right-hand front corner post 2. Fixed to the rock shaft in front of the corner post as by a pin 104 is a crank arm 105, said crank arm extending upward and being provided with a handle or finger piece 106. Projecting rearward from the upper end of the crank arm is a pointed locking pin 107 which is adapted to cooperate with two holes or openings 108 in the corner post to lock the crank arm and parts controlled thereby in predetermined positions. When the pin 107 is engaged with the left-hand hole 108 the parts are positioned as shown in Fig. 2 and the eccentric controlling member is operatively engaged with the slide block 73—74. The crank arm 105 is sufficiently resilient to permit the withdrawal of the pin 107 from locking engagement with the holes 108, this being done by pulling forward on the handle 106.

In order to render the crosswise feeding devices inoperative the locking pin 107 is withdrawn from the left-hand hole 108 and the crank arm 105 is moved toward the right until the locking pin engages with the right-hand hole 108. This movement of the crank arm 105 turns the rock shaft 101 and the crank arm 99, the latter operating through the pin 98 to slide the rod 95 longitudinally toward the right, thus causing the forked arm 93 to slide the eccentric controlling member rightward along the power shaft 34 until said member reaches the posi-

tion illustrated in Fig. 9 from which it will be seen that said member is entirely separated from the slide block 73—74. When the crosswise feeding devices are thus rendered inoperative, it is desirable to withdraw the actuating pin 70 from the control of the shiftable angular arm 91, as will be more clearly understood from what follows. To accomplish this withdrawal the angular arm 91 is provided with a rearward extension 91^a formed with a longitudinal slot 91^b, this slot cooperating with a pin 109 fixed to and extending upward from the loose collar portion 84^a of the eccentric member. The pin 109 may be shouldered as shown to provide a support for the portion of the arm 91 distant from the pivot thereof. During the up and down platen shifting movements the slotted extension 91^a will move up and down over the pin 109 without affecting the latter. When, however, the eccentric controlling member is slid to inoperative position along the power shaft 34 the pin 109 will act on the slotted extension 91^a to swing the arm 91 on its pivot 92 toward the right from the position shown in Fig. 7 to that shown in Fig. 9, thus disengaging the arm 91 from the fingers 88 and leaving the rod 72 loose in the slide block, thereby rendering the actuating pin 70 inoperative to oscillate the operating lever 43 on its pivot.

When the eccentric controlling member is withdrawn from operation, the slide block will be pushed to the end of its rearward travel by the spring 81 to the position shown for example in Figs. 1, 6 and 9. To prevent overthrow and limit this movement the block may be provided with a limiting or stop lug 110 which cooperates with a fixed pin or lug 111 on the bearing block 75 (Fig. 6). This operation of the spring 81 carries the actuating pin 70 to the rear of the slot 44. If, now, the finger button 65 be pushed in to raise the fulcrum block 46 the latter will in its upward movement lift bodily the operating lever 43 and said operating lever will carry with it the ribbon guide pivoted at its front end and the lever actuator at its rear end until said parts are in the positions shown in Fig. 4.

From what has been said it will be apparent that the operation of the rod 64 to set the ribbon guide in one of the two predetermined relations, determined by the spring detent 66 and the notches 68 and 69, will take place independently of the position of the platen, *i. e.* whether the platen be in normal position or in shifted position; and that the relation between the ribbon guide and the printing portion of the ribbon with respect to the platen will not be affected by the platen shift. In other words, whether the platen is in lower case or upper case position, the push button 65 may be operated to set the ribbon guide so as to present

either the upper field *a* (as in Fig. 1) or the lower field *b* (as in Fig. 4) of the ribbon at the printing point on the platen and the types may be caused to follow a straight path longitudinal of either field at will.

If preferred, an indicating device may be employed to indicate which of the ribbon fields is at the moment operative. Such an indicating device is shown in Figs. 1, 2 and 4 and comprises an angular lever 112 pivoted at 113 on a lug 114 extending rearward from the right-hand front corner post. The lower arm of the lever 112 extends downward and is forked or bifurcated to provide arms 115 which loosely embrace the rod 64, said arms 115 being loosely confined between two parallel cross pins 116 passing through the rod 64. The upper arm of the lever 112 inclines forward from the pivot and passes through an opening 117 in the corner post, terminating in a circular enlargement or cover plate 118 which is adapted to cover an indicating surface or disk 119 suitably secured at the front of the corner post. This disk may be marked to correspond with the lower field *b* of the ribbon. For example, if this lower field is red in color the disk 119 may be colored red. When the crosswise feeding devices are in use or when the upper field *a* of the ribbon is employed, the disk 119 is covered by the plate 118 (Figs. 1 and 2), but when the button 65 is pushed rearward to render the lower field *b* operative, the lever 112 will be turned and the plate or cover 118 will be moved forward and downward away from the disk 119, leaving the latter exposed to view (Fig. 4), and thus indicating that the ribbon field with which it corresponds is being employed.

When it is desired to restore the eccentric controlling device to operative position so as to again feed the ribbon crosswise, the handle 106 is operated to swing the crank arm 105 leftward, thereby operating to push the rod 95 inward and sliding the eccentric member leftward on the power shaft 34. During the first portion of this inward movement the pin 109 will operate on the extension 91^a to swing the arm 91 from the position shown in Fig. 9 to that shown in Fig. 8. From a consideration of the latter figure it will be noted that the arm 91 will have passed into the opening between the fingers 88 before the eccentric member can cooperate with the slide block 73—74. It will be apparent that this is necessary to prevent said eccentric member in some of the positions in which it might happen to be, from acting against the slide block and disturbing the vertical position of the rod 72 and fingers 88, preventing the opening in the latter from properly registering with the arm 91. The inward or leftward movement of the eccentric member and associate

parts is continued until they reach the positions shown in Fig. 7.

It will be understood that in all the operations hereinbefore described the ribbon guide will maintain the printing portion of the ribbon opposite to and covering the printing point on the platen. As has been stated the arrangement is such that only one or two of the characters last printed are covered by the ribbon. Sometimes, however, it is desired to inspect the character last printed and provision is made for accomplishing this by means which cooperate with that portions of the ribbon guide which extends below the pivot 42. This lower portion or extension may for convenience be designated by the reference character 39^a.

Referring specially to Figs. 1, 2, 3 and 3^a, 120 designates a pivoted arm or block provided with a longitudinal slot-way 121 which receives the extension 39^a of the ribbon guide, the fit being such that relative movement between the extension and the arm may readily be effected. The arm is provided with a reduced cylindrical bearing portion 122, the outer end of which is threaded, said bearing portion engaging in a bearing opening in a crank arm 123, the two arms being prevented from separating by a nut 124 which cooperates with the threaded end portion of the part 122. The crank arm 123 extends upward and is formed with a hub 125 which surrounds and is suitably secured to the inner end of a rock shaft 126 as by a pin 127. The rock shaft extends horizontally rightward beneath the top plate and is journaled on lugs 128 depending therefrom. A crank arm 129 is fixed to and extends from the rock shaft 126 at substantially right angles to the crank arm 123 at the opposite end of said rock shaft. A link 130 depends from the free end of the crank arm 129 and is pivotally connected at its lower end with a key lever 131, said key lever being fulcrumed at the fulcrum 5 and terminating at the keyboard of the machine in a finger button 132. The ribbon guide may be moved up and down as has been explained without disturbing the key operated mechanism just described, said guide during such movements sliding freely through the arm or block 120, the latter turning on its pivot and preventing any binding of the parts. Various of the relations between the crank arm 120 and the extension 39^a are illustrated in Figs. 1, 3, 4 and 5. When it is desired to withdraw the ribbon guide and ribbon from the face of the platen the key 132 is depressed, causing the link 130 to pull down the crank arm 129, rock the rock shaft 126 and swing the crank arm 123 rearward as said rock shaft turns. The rearward movement of the crank arm carries with it the block or arm 120 pivoted at its lower end and the latter will operate on the extension

39^a to swing the ribbon guide on its pivot 42 to the position shown in Fig. 3. From an inspection of this figure it will be noted that the printing portion of the ribbon has been moved far enough from the platen to entirely expose the printing line thereon. When the key 132 is released a restoring spring 133 will operate to restore the parts to the positions from which they were moved when said key was depressed.

From the foregoing, it will be observed that in accordance with my invention the ribbon guide is so held that a portion of the ribbon normally covers or registers with the printing point; that in the style of machine shown this is true in both the lower or normal and upper case or shifted positions of the platen; that there is a separate key-operated mechanism for moving this ribbon guide away from the platen so as to expose the last letter printed; that the ribbon guide is arranged to be shifted automatically with the platen; that there is a separate key-operated means for shifting the ribbon guide independently of the shifting of the platen, whereby the ribbon may be used in either one of two longitudinal fields as desired; that there is a mechanism for moving the ribbon guide and ribbon crosswise during the operation of the type keys and that this mechanism is operative in both the normal and shifted positions of the platen; that means are provided for rendering this crosswise feeding mechanism temporarily inoperative in case it should be desired to utilize the ribbon in separate longitudinal fields; and that means are provided for indicating which field of the ribbon is in use. These are some of the salient features of the invention; others and minor features have been brought out in the foregoing general description.

Various changes in the construction herein shown and described may be made without departing from the spirit of the invention, and of course it will be understood that some of the features thereof may be used without others, not only in the type of machines shown but in other types.

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

1. In a typewriting machine, the combination of rotary ribbon carriers mounted on shafts arranged to rotate in fixed bearings, a ribbon guide independent of said carriers, means for retaining said guide so that the printing portion of the ribbon covers the printing point, means for automatically progressively changing the position of said guide while it is retained with the ribbon covering the printing point, and hand-operative means for moving the ribbon at will to expose the printing point.

2. In a typewriting machine, the combination with a shiftable platen, of a ribbon

guide shiftable with said platen, means for retaining said guide so that the printing portion of the ribbon covers the printing point, means automatically operative in either position to which the platen may be shifted to change the position of said guide while it is retained with the ribbon covering the printing point, and hand operative means for moving the ribbon at will to expose the printing point.

3. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide shiftable therewith and normally maintaining the printing portion of the ribbon covering the printing point, means independent of the shift of the platen for operating automatically to change the normal position of said guide and the printing portion of the ribbon relatively to the printing point, and hand operative means for moving the ribbon at will to expose the printing point.

4. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide shiftable with said platen and normally maintaining the ribbon covering the printing point, means operating automatically to move said guide to and fro progressively to cause the printing portion of the ribbon to move back and forth over the printing point, and hand operative means for moving the ribbon at will to expose the printing point.

5. In a typewriting machine, the combination of rotary ribbon carriers, means operative on said carriers to feed the ribbon longitudinally, a ribbon guide independent of said carriers shiftable with the platen while the carriers remain at rest, means operative on said guide to give a crosswise feed to the ribbon, and hand controlled means operative on said guide to move it and the ribbon away from the printing point to expose the same.

6. In a typewriting machine, the combination of a ribbon guide, a lever connected with said guide and maintaining the latter normally so that the ribbon covers the printing point, means operating automatically to oscillate said lever on its fulcrum and move the guide so as to cause the printing portion of the ribbon to move back and forth while maintained over the printing point, and hand controlled means for moving the ribbon at will so as to uncover the printing point.

7. In a typewriting machine, the combination of means for feeding a ribbon longitudinally, a ribbon guide, a lever connected with said guide and maintaining the latter so that normally the ribbon covers the printing point, means operative automatically on said lever to move the guide and cause a continuous cross feed of the ribbon while over the printing point, and hand controlled

means operative at will on said guide to move the ribbon away from the printing point so as to expose the same to the view of the operator.

8. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide, a lever supporting said guide so that the latter normally maintains the ribbon opposite to and covering the printing point, said lever being shiftable with the platen, means for moving said lever to change the normal position of said guide, and hand controlled means operative at will to move the ribbon to expose the printing point.

9. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide, a lever supporting said guide so that the latter normally maintains the ribbon opposite to and covering the printing point, said lever being shiftable with the platen, means operating automatically on said lever independently of the shift position of the platen to vary the normal relation of both the guide and the printing portion of the ribbon with respect to the printing point, and hand controlled means operative on said guide to move the ribbon away from the platen to expose the printing point thereon.

10. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide, a lever having a shifting fulcrum connected to shift with the platen, said lever supporting said guide so that in both positions of the platen the printing portion of the ribbon covers the printing point on the platen, and means operating automatically to oscillate said lever on its fulcrum and thereby move the guide and the printing portion of the ribbon to and fro over the printing point.

11. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide, means for feeding the ribbon longitudinally, a lever having a shifting fulcrum connected to shift with the platen, said lever supporting said guide so that normally the printing portion of the ribbon covers the printing point on the platen, and means automatically operating on said lever to move said guide to impart a crosswise feed to the ribbon while it is over the printing point.

12. In a typewriting machine, the combination of a ribbon guide normally maintaining the ribbon at the printing point, means operating automatically for changing the position of said guide while the ribbon is maintained at the printing point, means for rendering inoperative said automatic means, and means for at will moving said ribbon to expose the printing point.

13. In a typewriting machine, the combination of a ribbon guide normally maintaining the ribbon at the printing point, automatic means for changing the position of said guide, while said ribbon is maintained

at the printing point, means for rendering inoperative said automatic means, means for setting the guide in a predetermined relation with the printing point, and hand controlled means for moving the ribbon at will to expose the printing point.

14. In a typewriting machine, the combination of a ribbon guide which normally maintains the ribbon at the printing point, automatic means for moving said guide step-by-step in opposite directions to move the ribbon to and fro over the printing point, means for rendering inoperative said automatic means, and means for at will moving the ribbon to expose the printing point.

15. In a typewriting machine, the combination of a ribbon guide which normally maintains the ribbon at the printing point, automatic means for moving said guide step-by-step in opposite directions to move the ribbon to and fro over the printing point, means for rendering inoperative said automatic means, means for thereafter setting said guide and ribbon in any one of a plurality of predetermined relations with the printing point, and hand controlled means for at will moving the guide and the ribbon to expose the printing point.

16. In a typewriting machine, the combination of a ribbon guide, automatic means for moving the ribbon crosswise, means for rendering inoperative said automatic means, hand operated means for setting the ribbon to cover and run longitudinally over the printing point in any one of a plurality of selective positions, and other hand operated means for moving the ribbon to and from the printing point to expose or cover the same at will.

17. In a typewriting machine, the combination of a ribbon guide normally maintaining the ribbon at the printing point, automatic means operative on said guide to give a crosswise feed to the ribbon, means for rendering inoperative said automatic means, hand operated means for setting said guide in a fixed relation with the printing point, and other hand operated means for moving said guide at will to move the ribbon away from the printing point.

18. In a typewriting machine, the combination of a ribbon guide normally maintaining the ribbon at the printing point, automatic means operative on said guide to give a crosswise feed to the ribbon, hand controlled means for rendering the crosswise feeding means inoperative, separate hand controlled means for changing the normal relation of said guide to the printing point independently of said crosswise feeding means, and key controlled means operative at will on said guide to move the ribbon away from and toward the printing point to uncover or cover the same.

19. In a front-strike writing machine, the

combination of ribbon spools, a guide which maintains the printing portion of the ribbon normally covering the printing point, automatic means for moving said guide step-by-step to and fro while held over the printing point independently of said ribbon spools, and means for rendering inoperative said automatic means at will.

20. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide shiftable with the platen and normally maintaining the ribbon at the printing point, automatic means operating in both shift positions of the platen to change the position of said guide, and means for rendering inoperative said automatic means.

21. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide shiftable with said platen and normally maintaining the ribbon at the printing point, automatic means operating in both shift positions of the platen to move the guide step-by-step in opposite directions, and means for rendering inoperative said automatic means.

22. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide shiftable with the platen and normally maintaining the ribbon at the printing point, automatic means operating in both shift positions of the platen to change the position of said guide, means for rendering inoperative said automatic means, and means for thereafter setting said guide in a predetermined relation with the printing point.

23. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide shiftable with said platen and normally maintaining the ribbon at the printing point, automatic means operating in both shift positions of the platen to move the guide step-by-step in opposite directions, means for rendering inoperative said automatic means, and hand operated means for setting said guide in a predetermined relation with the printing point independently of said automatic means.

24. In a front-strike typewriting machine having a platen shiftable up and down, the combination of a vertically disposed ribbon guide normally maintaining the ribbon at the printing point and shiftable up and down with the platen, automatic means operating in both shift positions of the platen to move said guide progressively up and down to impart a crosswise feed to the ribbon while over the printing point, and means for rendering inoperative at will said last recited means.

25. In a front-strike typewriting machine, the combination of a vertically disposed ribbon guide which normally maintains the ribbon at the printing point, automatic means for moving said guide alternately up and down step-by-step, means for render-

ing inoperative said automatic means, and means for thereafter setting said guide in a predetermined relation with the printing point independently of said automatic means.

26. In a front-strike typewriting machine, the combination of a vertically disposed ribbon guide which normally maintains the ribbon at the printing point, automatic means for moving said guide alternately up and down step-by-step, and means for rendering inoperative said automatic means.

27. A ribbon mechanism for typewriting machines including a main ribbon guide provided with guide slots arranged transversely of the printing line, one at each side of the printing point and normally maintaining the ribbon thereat, one of said slots being nearer the printing point than the other, and two side guides disposed one at each side of and forward of said main guide, the ribbon being deflected downward and forward from the main guide to the side guides.

28. In a front strike writing machine, the combination of a platen, ribbon spools, one at each side of the machine and forward of the platen, a vertically disposed ribbon guide between said ribbon spools and close to the face of the platen, said guide being provided with two guide slots one vertically disposed at each side of the printing point and normally maintaining the printing portion of the ribbon close to the printing point and substantially vertical, the ribbon extending from each of said slots forward and downward toward one of the spools, and one of said slots being nearer the printing point than the other of said slots.

29. In a ribbon mechanism for typewriting machines, the combination of an upright ribbon guide lever pivoted between its ends, the upper arm guiding and normally maintaining the ribbon at the printing point, a key at the keyboard of the machine, and connections between said key and the lower arm of said guide lever.

30. In a front-strike typewriting machine, the combination with a shiftable platen, of a pivoted ribbon guide shiftable bodily with the platen, a hand device, and slidable connections between said hand device and said guide, said hand device operating to swing said guide away from the platen at will and said connections affording a change in the normal relationship between said hand device and said guide.

31. In a typewriting machine, the combination of a pivotally mounted and shiftable ribbon guide which normally maintains the printing portion of the ribbon at the printing point, a crank arm having a slidable connection with said guide, and a hand operated rock shaft on which said crank arm is mounted.

32. In a typewriting machine, the combination of a pivotally mounted and shiftable ribbon guide which normally maintains the printing portion of the ribbon at the printing point, a slotted member or block having a slidable connection with said ribbon guide, and a hand-controlled member on which said block is supported.

33. In a typewriting machine, the combination of a ribbon guide, a lever pivotally supporting said guide so that it normally maintains the ribbon at the printing point, means operating on said lever to vary its normal position while the ribbon remains at the printing point, and hand controlled means for moving said ribbon to expose the printing point.

34. In a typewriting machine, the combination of a ribbon guide, a lever pivotally supporting said guide so that it normally maintains the ribbon at the printing point, and an actuator for said lever movable toward and away from the fulcrum thereof to vary the normal position of said lever while the ribbon is still maintained at the printing point.

35. In a front-strike typewriting machine, the combination of a vertically arranged ribbon guide, a horizontally disposed operating lever one arm of which pivotally supports the guide so that the ribbon normally covers the printing point, the other arm of said lever being provided with a cam slot, and an actuator movable horizontally toward and away from the fulcrum of said lever to cause said lever to move progressively up and down.

36. In a typewriting machine, the combination of a shiftable platen, a ribbon guide, an operating lever, a fulcrum block on which said lever is fulcrumed, automatic means operating independently of the shift of the platen for moving said fulcrum block to alter its normal position, and hand operated means for moving said fulcrum block independently of said automatic means.

37. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide, an operating lever normally maintaining said guide with the ribbon covering the printing point, a device for actuating said lever, a fulcrum block on which said lever is fulcrumed, said block and said device being shiftable with said platen, and hand operated means for shifting said fulcrum block independently of the shift of the platen.

38. In a typewriting machine, the combination with a platen and a key-controlled platen shifting frame, of a ribbon guide, a lever supporting said guide, a slidably supported fulcrum block in which said lever is fulcrumed, a support for said fulcrum block on said platen shifting frame, and means for moving the fulcrum block bodily to change

the relation between said fulcrum block and its support.

39. In a typewriting machine, the combination with a platen and a key-controlled platen shifting frame, of a ribbon guide, a lever supporting said guide, a fulcrum block in which said lever is fulcrumed, a supporting bracket fixed to said platen shifting frame and on which said fulcrum block is adapted to rest, and means operative independently of the platen shifting movements to lift said fulcrum block from said bracket.

40. In a typewriting machine, the combination of a ribbon guide, a lever connected with said guide, a fulcrum block for said lever, a support for said fulcrum block, parallel guides for said fulcrum block, one at each side of said lever, and means for moving said fulcrum block on said guides.

41. In a front-strike writing machine, the combination with a shiftable platen, a vertically disposed ribbon guide, a horizontally arranged operating lever pivotally connected with said guide to maintain the ribbon normally at the printing point, a fulcrum block for said lever vertically shiftable with said platen, and means operative independently of the platen shift to move said fulcrum block vertically.

42. In a typewriting machine, the combination of a ribbon guide, a lever connected therewith, a fulcrum block for said lever, a support on which said fulcrum block is adapted to rest, and means for moving said fulcrum block relatively to said support, said means comprising a rock shaft, a crank arm fixed thereto and connected with said fulcrum block, a second crank arm connected to said rock shaft, and a hand-actuated slide rod connected with said second crank arm.

43. In a typewriting machine, the combination of a ribbon guide, a lever connected therewith, a fulcrum block for said lever, a support on which said fulcrum block is adapted to rest, and means for moving said fulcrum block relatively to said support, an extension on said fulcrum block, a rock shaft, a crank arm on said rock shaft pivotally connected with said extension, a second crank arm on said rock shaft, a hand-operated slide rod pivotally connected with said second crank arm, and means for maintaining said slide rod in one or another of a plurality of predetermined positions.

44. In a typewriting machine, the combination with a platen and a key-controlled platen shifting frame, of a ribbon guide, a lever connected therewith, a fulcrum block for said lever, a support for said fulcrum block mounted on said platen shifting frame, and means for shifting said fulcrum block independently of said shifting frame, said means comprising a rock shaft journaled on said shifting frame, connection between said rock shaft and said fulcrum block, and a

hand controlled device connected with said rock shaft, said hand-controlled device being partly supported directly on the machine frame and cooperating with a detent device to maintain said fulcrum block in one or another of a plurality of predetermined relations with its support.

45. In a typewriting machine, the combination of printing keys, a ribbon guide, an operating lever, a member on which said lever is fulcrumed, a device for actuating said lever, and automatic means operating independently of said printing keys for bodily moving said member, said device and said lever together.

46. In a typewriting machine, the combination of a platen, means for shifting said platen, a ribbon guide, an operating lever, a member on which said lever is fulcrumed, a device for actuating said lever, and means connected with and operated by the platen shifting means for bodily moving said member and said device.

47. In a typewriting machine, the combination with a ribbon mechanism comprising a ribbon having a plurality of fields of different characteristics and means for rendering any selected ribbon field operative, of an indicating disk corresponding with one of said ribbon fields, a cover for said disk, a lever connected with said cover, and connections between said lever and said first recited means.

48. In a typewriting machine, the combination with a ribbon mechanism comprising a two-color ribbon and means for rendering either color operative, of a disk colored to correspond to one of the ribbon fields and mounted on the machine frame, a movable cover for said disk, and connections between said cover and said first recited means.

49. In a typewriting machine, the combination of a ribbon guide, a lever connected with said guide, an actuator for said lever, a slidable support for said actuator, and hand controlled means for moving said actuator relatively to said support.

50. In a typewriting machine, the combination of a ribbon guide, a lever connected with said guide, an actuator for said lever, a slidable support for said actuator, means for moving said support to vary the relation between said actuator and said lever, and means for varying the relation between said actuator and its support.

51. In a typewriting machine, the combination of a ribbon guide, a lever connected with said guide, an actuator for said lever, a slidable support for said actuator, hand controlled means for varying the relation between the actuator and its support, and means for maintaining a fixed relation between said actuator and its support.

52. In a typewriting machine, the combination with a shifting platen, of a ribbon

guide, a lever connected therewith and shiftable with said platen, an actuator for said lever, a support for said actuator, means for moving said support, and means connected to shift with the platen for varying the relation between said actuator and its support.

53. In a typewriting machine, the combination with a ribbon guide, a lever connected therewith, a block slidably mounted on the frame of the machine and having a predetermined path of movement, and an actuator supported on said block and operative to vary the normal position of said lever.

54. In a front-strike writing machine, the combination of a vertically disposed ribbon guide, a horizontally arranged lever connected therewith, a slidably supported actuator, and means for moving said actuator horizontally in opposite directions to vary the normal position of said lever.

55. In a typewriting machine, the combination of a ribbon guide, a lever connected therewith and provided with a cam slot, an actuator comprising a pin cooperative with said slot, a supporting block on which said actuator is mounted, and means for bodily moving said supporting block.

56. In a typewriting machine, the combination with a platen and platen shifting devices, of a ribbon guide, a lever connected therewith and having a cam slot, said lever being shiftable with the platen, an actuator shiftable with the platen and comprising a pin engaging said cam slot, and a slidable block on which said actuator is supported, said slidable block having a fixed path of movement.

57. In a typewriting machine, the combination of a ribbon guide, a lever connected therewith, an actuator, and means for automatically moving said actuator bodily lengthwise of said lever to change the normal position of said lever.

58. In a typewriting machine, the combination of a ribbon guide, a lever connected therewith, an actuator for said lever, a slidable block supporting said actuator, a power shaft, an eccentric thereon cooperative with said slidable block to move the latter in one direction, and a spring operative to move said block in the opposite direction.

59. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide, a lever connected therewith, an actuator for said lever, means for preventing relative shifting movements in one direction between said actuator and the platen, and means for rendering said last named means inoperative.

60. In a typewriting machine, the combination of a ribbon guide, a lever connected therewith, an actuator for said lever, means for confining said actuator to a predetermined path longitudinal of said lever, and

means for rendering said last named means inoperative.

61. In a typewriting machine, the combination of a ribbon guide, a lever connected therewith, an actuator for said lever, a support on which said actuator is slidable, means for holding said actuator in a predetermined relation with its support, said means comprising a finger or projection on said actuator, and an arm or projection on a relatively fixed part, means for rendering said holding means inoperative, and means independent of said holding means for setting said guide.

62. In a typewriting machine, the combination of a ribbon guide, a lever connected therewith, an actuator for said lever, a support on which said actuator is slidable, means for holding said actuator in a predetermined relation with its support, said means comprising a finger or projection on said actuator, and an arm or projection on a relatively fixed part, said arm being movable to render it inoperative on said finger, and means independent of said holding means for setting said guide.

63. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide, a lever connected therewith, an actuator for said lever, a movable support on which said actuator is slidably mounted, a pair of fingers or extensions connected with said actuator, and an arm or member cooperative with said fingers and shiftable with the platen.

64. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide, a lever connected therewith, an actuator for said lever, a movable support on which said actuator is slidably mounted, a pair of fingers or extensions connected with said actuator, a pivoted arm or member cooperative with said fingers and shiftable with the platen, and means for rendering said arm inoperative on said fingers.

65. In a typewriting machine, the combination with a shiftable platen, of a ribbon guide, a lever connected therewith, an actuator for said lever, a movable support on which said actuator is slidably mounted, a pair of fingers or extensions connected with said actuator, a pivoted arm or member cooperative with said fingers and shiftable with the platen, and means for rendering said arm inoperative on said fingers, said last recited means comprising a slotted extension on said arm, a pin or extension cooperative with said slotted extension, and a hand controlled slide rod carrying said pin.

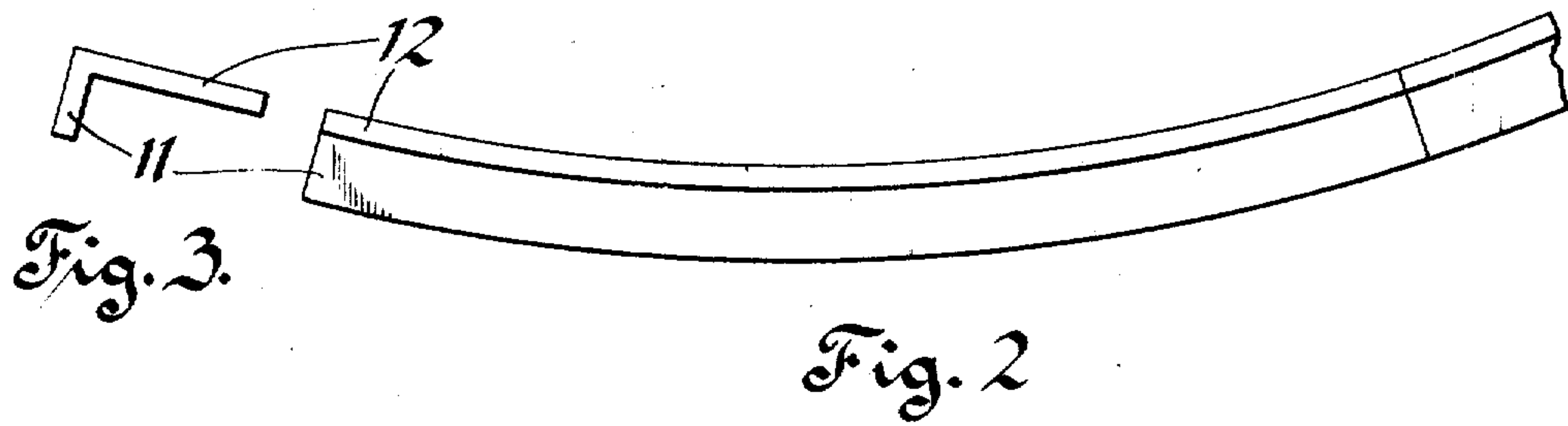
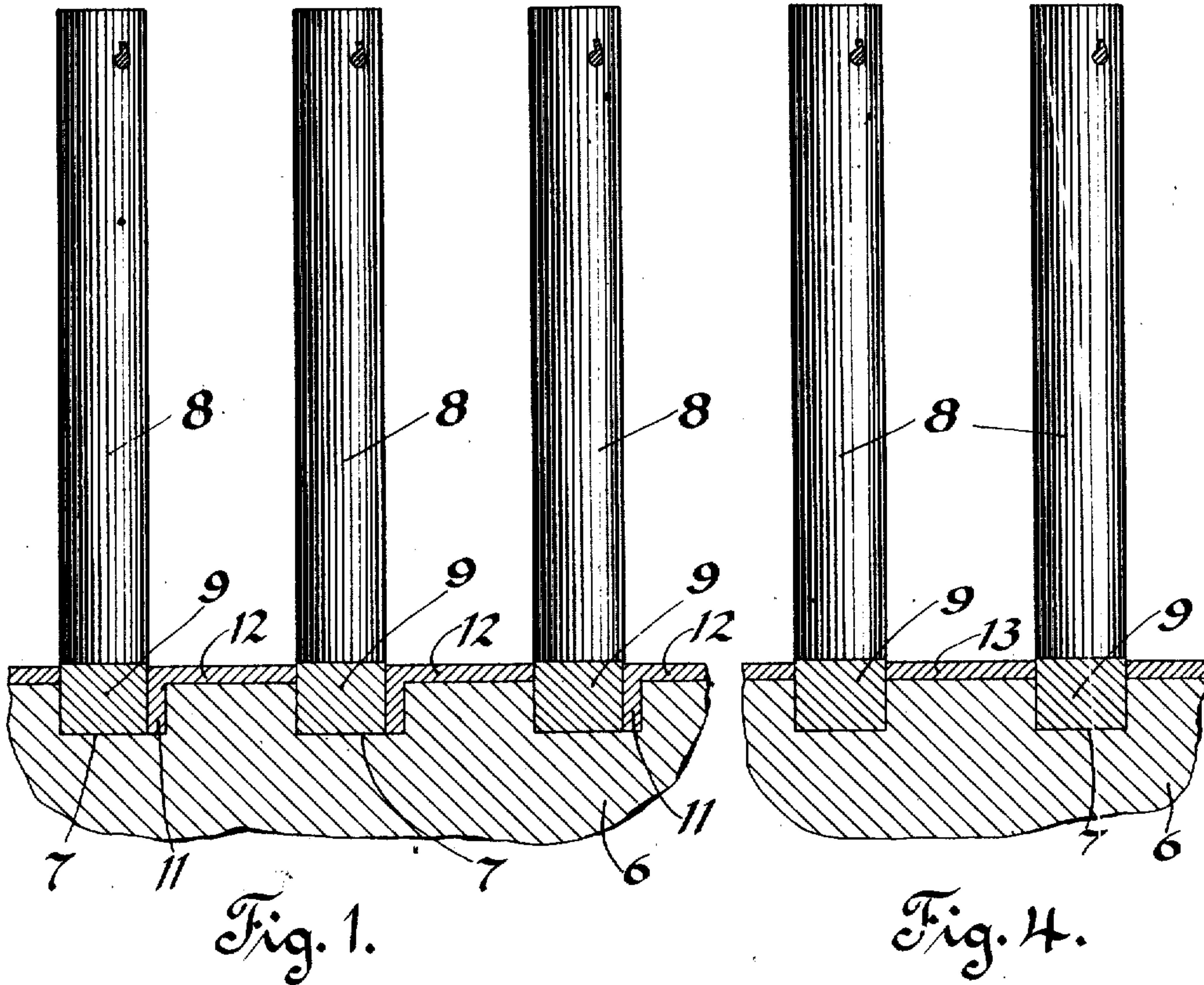
66. In a typewriting machine, the combination of a ribbon guide, a lever connected therewith, an actuator for said lever, a support for said actuator, a power shaft, an eccentric device cooperative with said

F. HODGKINSON.
ELASTIC FLUID TURBINE.
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3 SHEETS—SHEET 1.



WITNESSES:

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