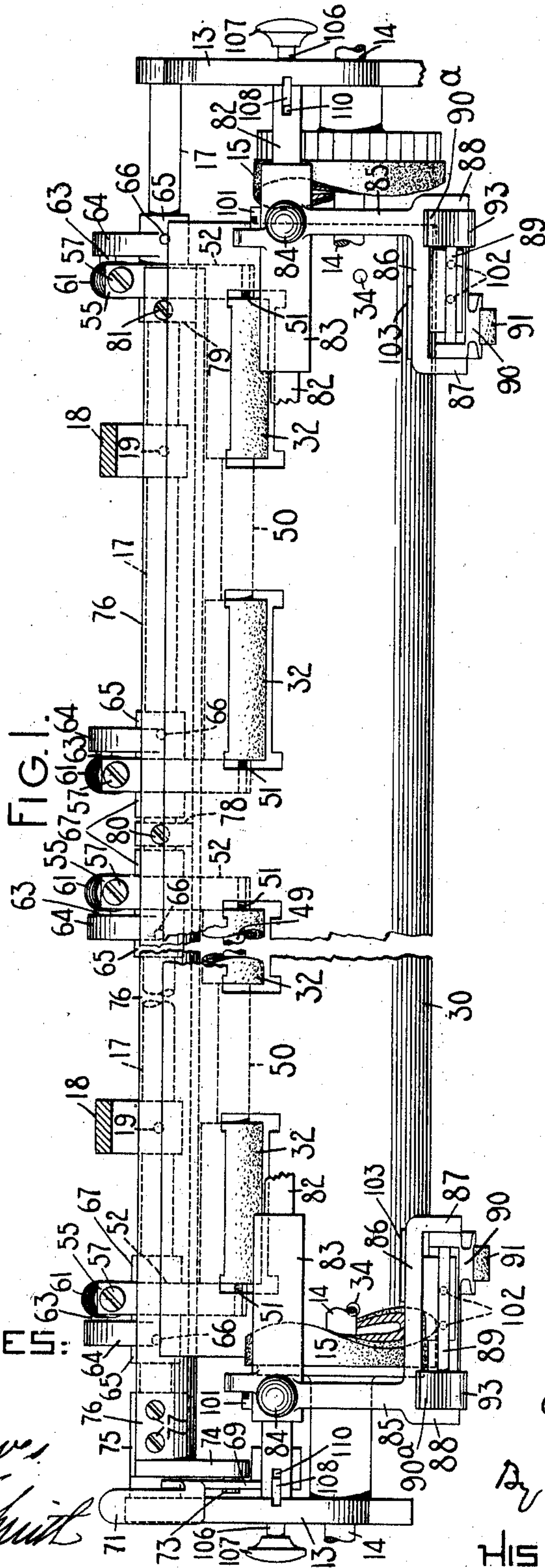


975,190.

O. WOODWARD.
TYPE WRITING MACHINE.
APPLICATION FILED MAY 21, 1908.

Patented Nov. 8, 1910.

7 SHEETS-SHEET 1.



WITNESSES:

J. B. Davis
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INVENTOR:

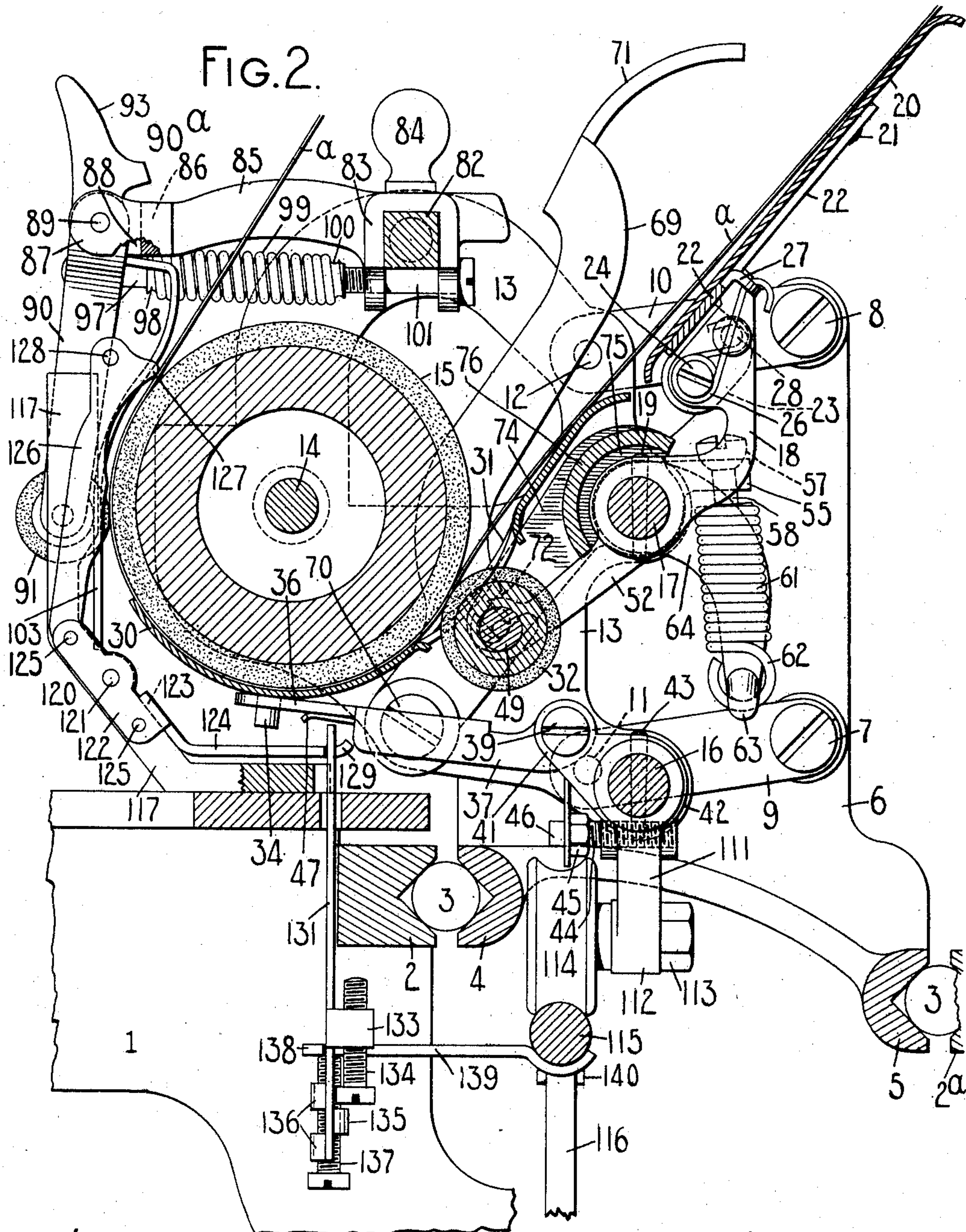
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7 SHEETS—SHEET 2.



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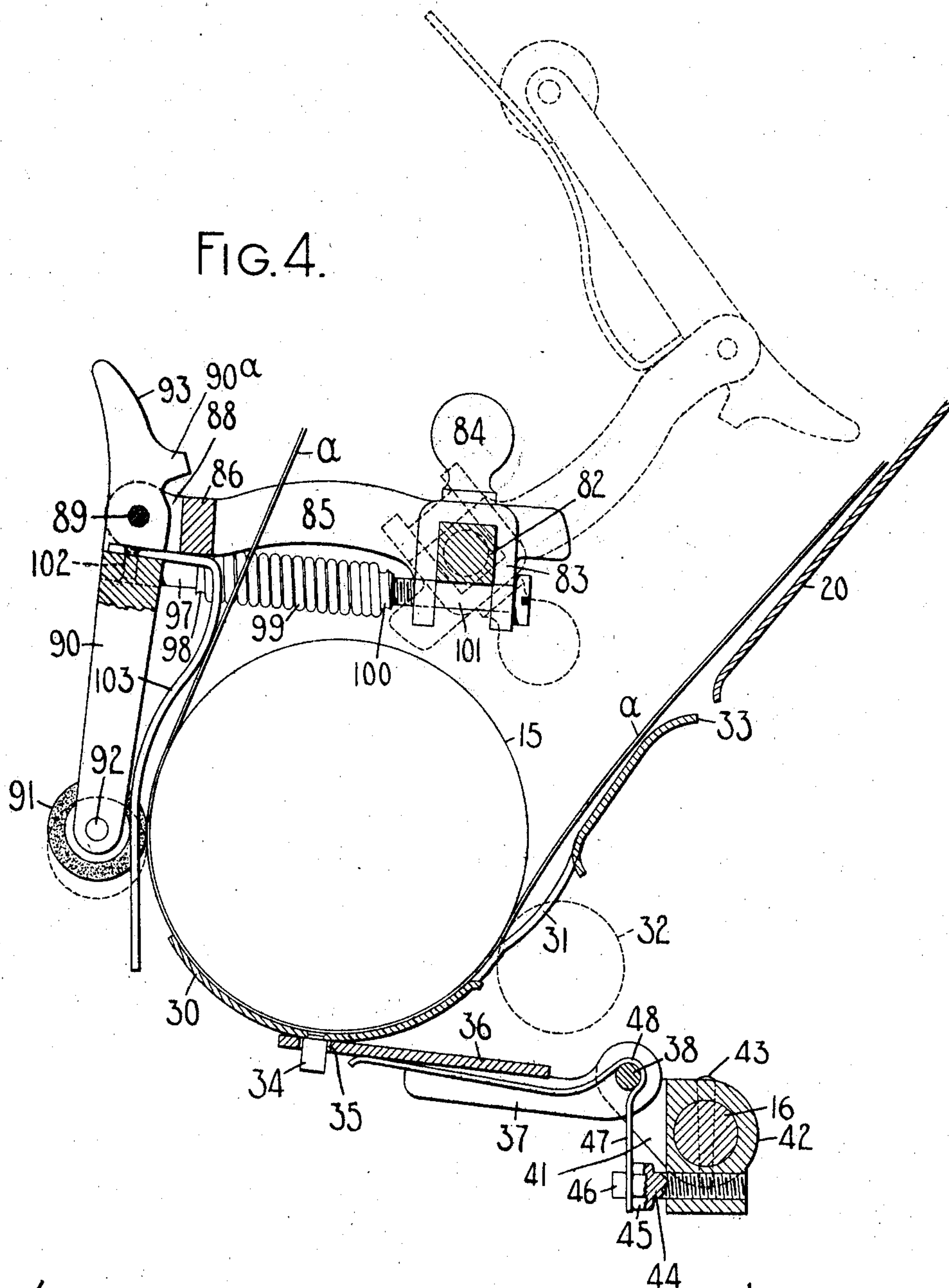
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7 SHEETS—SHEET 4.

FIG. 4.



WITNESSES:

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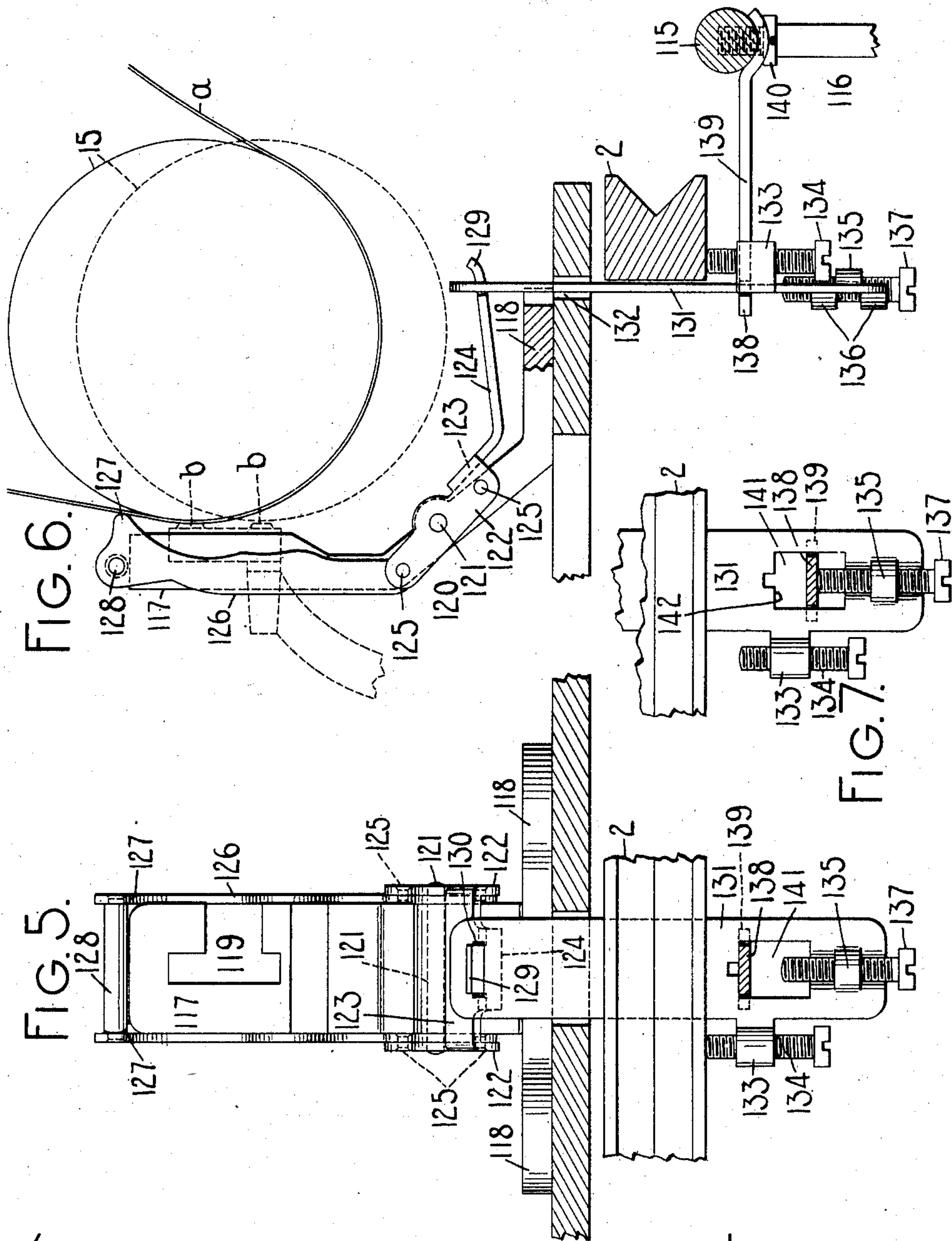
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O. WOODWARD.
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7 SHEETS—SHEET 5.



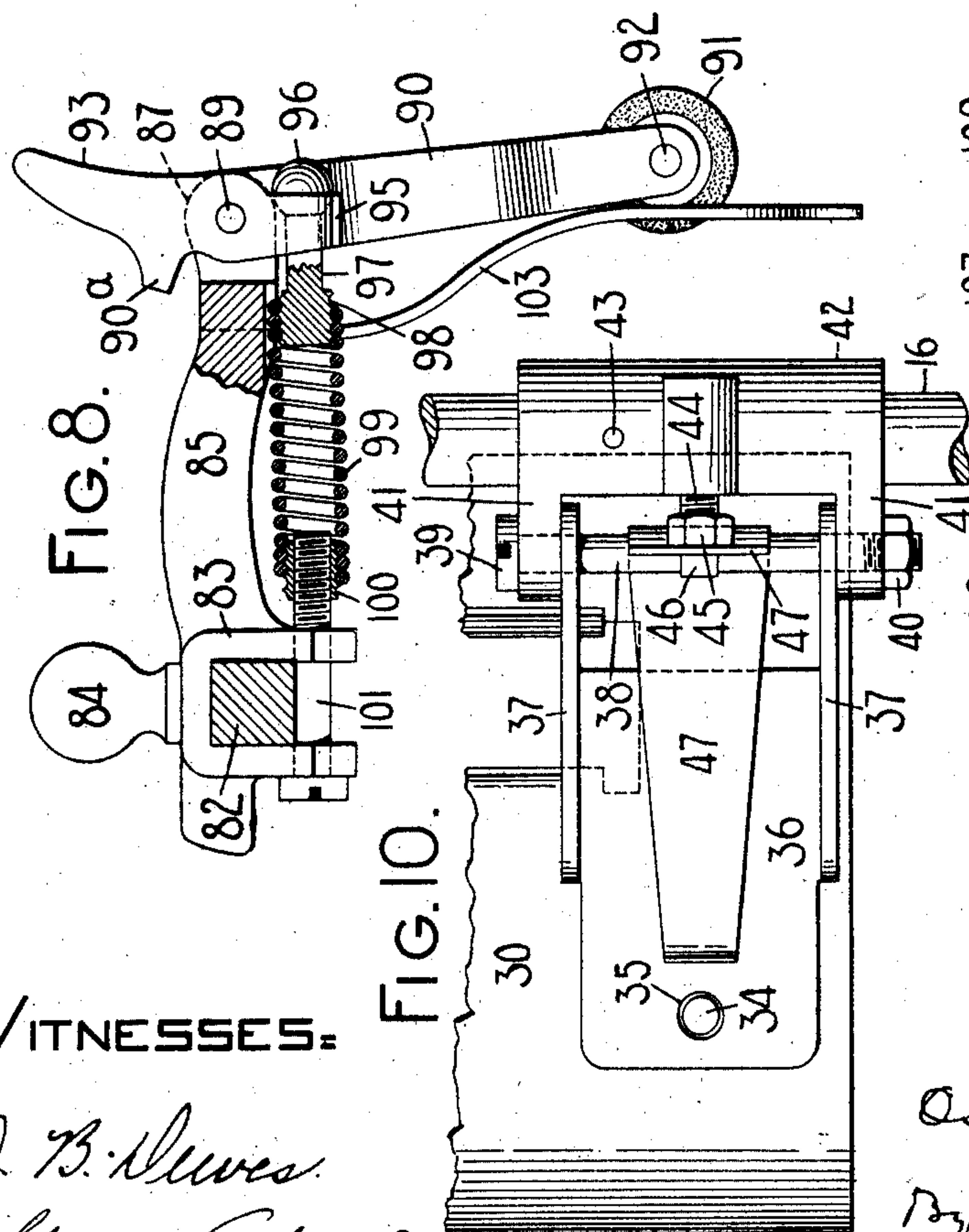
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7 SHEETS--SHEET 6.



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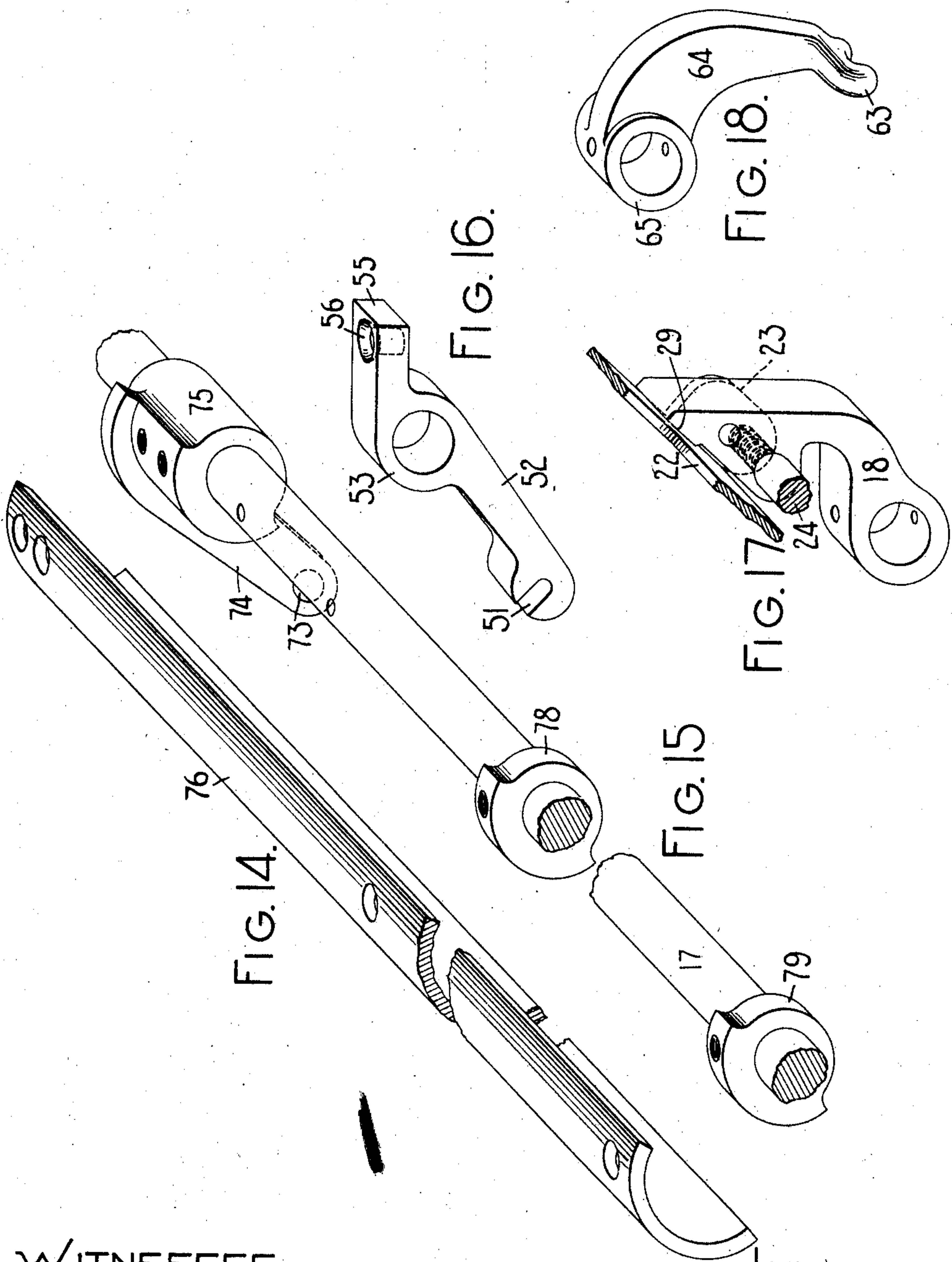
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975,190.

O. WOODWARD.
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APPLICATION FILED MAY 21, 1908.

Patented Nov. 8, 1910.

7 SHEETS—SHEET 7.



WITNESSES:

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UNITED STATES PATENT OFFICE.

OSCAR WOODWARD, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

975,190.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed May 21, 1908. Serial No. 434,131.

To all whom it may concern:

Be it known that I, OSCAR WOODWARD, citizen of the United States, and resident of Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to paper feeding and guiding devices and one object of my invention is to provide efficient means of the character specified.

A further object of the invention is to provide a construction in which the parts may be readily assembled or dismantled.

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

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a top plan view with parts sectioned away of a platen frame and the devices carried thereby. Fig. 2 is an enlarged detail transverse fragmentary sectional view taken through the upper portion of the machine and showing the carriage and some of the parts associated therewith. Fig. 3 is an enlarged detail fragmentary rear elevation with parts in section, the view showing the portion of the platen frame and parts carried thereby. Fig. 4 is an enlarged detail transverse vertical sectional view showing the platen and some of the paper feeding devices. Fig. 5 is an enlarged detail rear elevation with parts in section of one of the paper guiding devices and some of the associated parts. Fig. 6 is a side elevation of the same with parts in section. Fig. 7 is a fragmentary detail front elevation with parts in section, the view illustrating a portion of the structure shown in Figs. 5 and 6, Fig. 7, however, showing a different relation of the parts from that illustrated in Figs. 5 and 6. Fig. 8 is an enlarged detail side elevation with parts in section of certain of the paper feed devices. Fig. 9 is an enlarged detail front elevation of some of the parts shown in Fig. 8. Fig. 10 is an

enlarged detail fragmentary bottom view showing the paper apron and the supporting means therefor at one end of the platen. Figs. 11, 12 and 13 are enlarged detail fragmentary sectional views of the supporting bar for the paper feed fingers and locking means for said bar. Figs. 14, 15, 16, 17 and 18 are detail perspective views of parts of the structure to be hereinafter fully described.

I have shown the different features of my invention embodied in a front-strike machine, though it should be understood that the invention may be embodied in other styles of typewriting machines.

The frame 1 of the machine supports fixed guide rails 2 and 2^a having oppositely disposed grooved faces or raceways in which anti-friction balls or rollers 3 are received, said rollers also cooperating with grooved faces or raceways in guide rails 4 and 5 carried by or formed with a part of a truck 6. Pivoted to the truck at 7 and 8 are forwardly extending parallel links 9 and 10 respectively, the forward ends of which are pivoted at 11 and 12 respectively to end plates 13 of the platen frame provided with journal bearings for a shaft 14 to which a cylindrical rotative platen 15 is secured. The platen frame in addition to the end plates comprises cross bars or rods 16 and 17 which are secured at their ends to the end plates 13 and constitute rigid connections between said end plates. Two upwardly extending brackets 18 (shown in detail in Fig. 17) are secured to the cross rod 17 by pins 19 which pass through openings in the hubs of said brackets and through openings in the rod 17.

A paper table 20 has riveted to the back thereof at 21 a sheet metal frame or bracket piece 22 (see Fig. 3). This bracket 22 has depending ears 23 at the ends thereof, one that extends outside of each of the brackets 18. A shouldered screw 24 is received in a tapped opening in each of the brackets 18 and extends through the bracket so as to provide a pivot 25 at the outer reduced end for cooperation with a depending bracket arm 23 so as to pivotally connect the paper table to the brackets 18. The unthreaded body portion of each screw 24 inside of its associated bracket 18 constitutes a bearing

or support for a coiled spring 26. One end of each coiled spring 26 is hooked and projects through an aperture in an ear 27 formed on the bracket plate 22. The other
 5 end of each spring 26 is bent around a headed pin 28 which projects inwardly from the associated bracket 18.

From an inspection of Fig. 17 it will be observed that each bracket 18 has an inclined face or abutment 29 against which
 10 the bracket 22 is adapted to bear when the paper table is in the normal position in order to limit the movement of the paper table in one direction and to afford a support for
 15 the paper table when it is in the normal position.

If desired, the paper table may be moved forwardly against the tension of its springs 26 around the pivots 25 in order to gain access to the parts situated beneath the paper
 20 table.

A paper apron 30, which is best shown in Fig. 4, conforms at its lower portion to the curvature of the platen and is recessed at
 25 31 to permit the main paper feed rollers 32 to project therethrough and to bear against the platen or the paper thereon. The upper edge 33 of the paper apron is situated just below the paper table and is bent rearwardly so that the paper *a* may be directed
 30 from the paper table to the paper apron and thence to the bight between the main paper feed rollers 32 and the platen without catching on the upper edge of the apron.
 35 The paper apron is provided at the lower side thereof with depending pins 34 riveted to the paper apron and received in enlarged openings 35 in supporting members 36, each member being struck up from a piece of
 40 sheet metal which is formed with ears 37 perforated for the reception of a pivot pin 38 headed at 39 (see Fig. 10) and threaded at its opposite end for coöperation with a nut 40. The pivot pin 38 of each supporting
 45 member extends through openings in ears 41 projecting from a bracket 42 which surrounds the cross bar or rod 16 and is secured thereto by a pin 43 which extends through openings in said bracket and in the rod 16.
 50 The lower depending portion of each bracket 42 is tapped to receive a screw 44 having an angular head 45 by which the screw may be adjusted and a contracted portion 46, which projects through an opening in a spring 47,
 55 which spring is bent at 48 to coöperate with the associated pivot 38 and bears at its forward free end against the bottom of the associated supporting member 36.

It will be understood that each of the
 60 screws 44 provides an individual adjusting means to vary the tension of the spring 47 of the associated support 36 for the paper apron, one of these supports being located near each end of the paper apron as shown

in Fig. 13 so that individual adjusting means
 65 are provided at each end of the paper apron for varying the tension of the pivoted supporting arms therefor, said supporting arms bearing upwardly against the paper apron and forcing the curved portion thereof into
 70 contact with the platen or the paper thereon. The paper apron may be readily removed when desired by depressing the pivoted arms 36 and removing the depending projections 34 from the apertures in said arms and by
 75 releasing the main paper feed rollers 32.

It will also be observed that the springs 47 may be readily sprung into place in assembling the machine, or that a new spring may be readily sprung into place to replace
 80 a broken one. The main paper feed rollers 32 are separately movable rollers mounted upon a shaft 49 and are separated from each other on said shaft by spacing sleeves 50 (see Fig. 3). The outer ends of the shaft
 85 49 are received in open mouthed bearings 51 (see Fig. 16) in hangers 52. Each of these hangers has a hub 53 which surrounds the connecting rod 17 and is free to turn thereon. Each hanger is in the nature of a lever
 90 of the first order having a depending lever arm which supports one end of the feed roller shaft and an arm 55 which extends in opposite directions from the pivot 17 for
 95 said hanger. The arm 55 is provided as a socket 56 which conforms to and is adapted to receive the bottom of a rounded portion 57 of the head of an adjusting screw 58. The stem of this screw passes through an enlarged opening 59 in the hanger arm and has
 100 its lower threaded end received in a tapped opening in a block 60 which is threaded on its periphery for coöperation with the convolutes of a contractile spring 61, the block being received in the spring at one end thereof.
 105 The lower end of the spring 61 is provided with a hook or loop 62 which engages the hook 63 on a depending bracket arm 64, the hub 65 of which surrounds the connecting rod 17. The bracket is secured to the
 110 rod 17 by a pin 66 which passes through openings in the hub of the bracket and in the rod 17. Each pivoted hanger is confined against longitudinal movement on the rod 17 by the hub 65 of the associated
 115 bracket 64 and by a collar 67 secured to the rod by a set screw 68. It will be observed that each screw 58 and the means associated therewith constitute individual adjusting
 120 means for each of the hangers for the main feed rollers, and that an adjustment of each of said screws is effective to vary the tension of the spring 61 for the feed rollers at opposite ends of the feed roll shaft. The construction of the tension devices for each of
 125 the hangers and the construction of the means for effecting an adjustment thereof is such that the parts may be readily discon-

connected when desired and may be readily assembled in the machine.

From an inspection of Figs. 2 and 3 it will be seen that a release lever 69 is pivoted at 5 70 to the left-hand end plate 13 of the platen frame, the upper end of said lever being formed with a finger piece 71. This lever has an open-mouthed cut-out or recess 72 therein for the reception of a pin 73 which 10 projects outwardly from a depending arm 74 provided with a hub 75 (see Fig. 15) which loosely surround the connecting rod 17. An actuating or releasing bar 76, shown in detail in Fig. 14, is secured by screws 77 15 to the hub 75. This bar is likewise secured to collars or sleeves 78 and 79 by screws 80 and 81 respectively (see Fig. 1). The sleeves 78 and 79, like the sleeve or hub 75, turn freely on the rod 17. The release bar 20 76 is curved in transverse section and is mounted on the rod 17 so as to turn concentrically with the axis of the feed roll hangers, the bar 76 extending substantially throughout the length of the platen and 25 adapted to contact at its lower edge with the upper edges of the feed roll hangers as shown in Fig. 2. A rearward movement of the finger piece 71 of the release lever is effective to move the depending arm 74 rearwardly. This effects a bodily movement of 30 the release bar 76 around the axis of the feed roll hangers and causes the hangers to be moved against the tension of their springs away from the platen to effect the release of 35 the feed rollers. When pressure is released on the finger piece 71 the springs 61 are effective to move the feed rollers into contact with the platen or the paper thereon and to restore the release bar and release 40 lever to their normal positions.

From an inspection of Figs. 2, 3, 4 and 8 it will be seen that a supporting bar 82, which is angular in cross section, is mounted on the end plates 13 of the platen frame and 45 is situated above the platen. Substantially U-shaped supports 83 surround the supporting bar or rod 82 on three sides and are each provided with an upwardly extending finger piece 84 by which the U-shaped supports 50 or slides may be moved longitudinally of the platen. These supports or slides, however, conform to the angular shape of a bar 82 and are thereby prevented from turning on the bar. Connected to each of the supports 55 or slides 83 is a substantially horizontally directed arm 85 which is rigidly secured to the slide and extends over the platen to a position forward of the front face thereof. Each of the arms 85 has an off-set inwardly 60 directed portion 86 projecting therefrom with a forwardly directed portion 87 thereon. The part 87 with a like part 88 projecting from the arm 85 constitutes a support for a pivot 89 which is secured thereto. Re-

ceived between the parts 87 and 88 is a de- 65 pending substantially vertically disposed hanger or carrier 90 shown in detail in Fig. 9. This carrier is bifurcated at its lower end to receive a paper feed roller 91 pivoted to the bifurcated portion at 92. A finger 70 piece 93 extends upwardly from each of the members 90 so as to provide means by which the paper feed roll hanger 90 may be turned on its pivot 89 to release the associated feed roller 91 and paper finger. A projection 90^a 75 on each hanger 90 co-acts with the associate member 86 to limit the hanger in its forward movement around its pivot 89. Each feed roll hanger 90 is formed with a socket 80 94 having an open mouth 95.

A ball or rounded portion 96, formed at one end of a member 97, is received in the socket 94 and is provided with a threaded end 98 received in one end of a coiled spring 99 and threaded into the convolutes thereof. 85 The opposite end of each spring 99 receives an exteriorly threaded block 100 having a tapped opening for cooperation with the threaded end of a screw 101. Each screw 101 passes through openings in the depend- 90 ing side arms of the associated U-shaped slide 83 so as to bridge the opening between said arms and to pass under the bar 82 and prevent the slide from being removed from the bar. Each screw 101 provides individual 95 adjusting means for varying the tension of the spring 99 of the associated feed roller 91. The construction is such that each of the members 83 and the parts carried there- 100 by may be readily disconnected from the supporting rod 82 when desired; or the members 97 may, if desired, be disconnected from the feed roll hanger arms 90 by removing the members 97 through the open 105 mouthed slots 95 of the sockets in which the balls 96 are received. Each feed roll hanger 90 has secured thereto by rivets 102 (see Fig. 4) a depending paper finger 103 hav- 110 ing a portion extending tangentially to the platen, when the parts are in their normal positions, and directing the paper α from the paper apron upwardly and rearwardly over the supporting bar 82.

From an inspection of Fig. 1 it will be seen that a support 83 with the parts car- 115 ried thereby is provided near each end of the platen and that each carrier and the parts carried by it may receive an adjustment longitudinally of the platen. From an inspection of Figs. 1, 11, 12 and 13, it will 120 also be seen that the supporting bar 82 is apertured at each end as indicated at 104 for the reception of a spring-pressed bolt 105 having a cylindrical portion 106 that 125 passes through a bearing opening in an end plate 13 of the platen frame so that the supporting bar 82 may turn on the bearing portions 106 of the spring-pressed slides or

bolts. Each bolt has a finger piece or head 107 by which it may be manipulated and is also provided with a feather or locking member 108 projecting from the bolt on opposite sides thereof and adapted to be received in locking recesses or openings 109 in an end plate 13 of the platen frame and likewise engaging in slots 110 in the bar 82. When the bolts are in the outermost positions indicated in Fig. 12 the locking member or feather 108 engages in the locking recesses 109 of the platen frame and locks the bar 82 against turning movement and retains the parts in positions where an effective pressure of the feed rollers 91 is maintained against the platen. When, however, the finger pieces 107 are pressed toward each other against the tension of the springs 104, the locking members 108 will be moved out of the locking recesses 109, thereby freeing the supporting bar 82 so that it may turn on the pivotal portions 106 of the locking members to the position indicated in full lines in Fig. 4, so as to relieve somewhat the pressure of the paper fingers and the rollers 91. When the supporting bar 82 is released in the manner specified the ends of the feathers 108 bear upon the unslotted inner faces of the end plates 13 and prevent the bolts from being pressed by their springs 104 into reengagement with the locking slots. If desired, the bar 82, together with the parts carried thereby, may be turned to the dotted line position indicated in Fig. 4 so as to remove the paper fingers and feed rollers 91 entirely out of cooperation with the platen.

From an inspection of Fig. 2 it will be observed that the feed rollers 91 cooperate with the platen substantially at the printing line—a position where they are most effective to co-act with the paper to properly maintain it snug against the platen at the line of impact of the types *b* (see Fig. 6) upon the platen. It has been found in practice that the arrangement of the paper feed rollers 91, as herein shown and described, is most efficient and the construction is such that I am enabled to dispense with the forward set of feed rollers usually employed in front-strike machines, the margin feed rollers 91, acting in two-fold capacity as margin feed rollers and forward feed rollers.

From an inspection of Fig. 2 it will be observed that the lower cross rod 16 is provided with a depending arm 111 situated about midway in the length of the rod. The lower end of this arm has a hub 112 through which a shouldered screw pivot pin passes, the pivot pin being secured in place by a nut 113 which cooperates with the rear end thereof. This pivot pin constitutes a bearing for the grooved roller 114 which bears upon a shift rail 115 carried by upright arms 116 connected to suitable manually operated

case shift mechanism (not shown), such for instance as that disclosed in my application, Serial No. 422,710, filed March 23rd, 1908. By these means the platen frame and platen may receive a vertical shifting movement on the parallel links 9 and 10 to change the case position of the platen.

By referring to Figs. 2, 5 and 6 it will be observed that a fixed center guide 117 is provided with off-set feet 118 by which it is rigidly secured to the frame 1 of the machine. The center guide extends upwardly and forwardly from its support and projects in front of the platen and has a type guiding opening 119 in the upper portion thereof. A center paper guide, designated as a whole by reference numerals 120, is pivoted at 121 to the fixed type guide. This paper guide is formed of sheet metal and comprises two parallel side portions 122 which are situated on opposite sides of the type guide and are pivoted directly thereto by the pivot pin 121. These side members are united by a cross piece 123 from which extends a rearwardly directed finger 124. Riveted at 125 to the side members 122 are upwardly directed side arms 126 which terminate in the contact fingers 127 which are adapted to bear on the platen or the paper thereon above the printing line and above the horizontal plane passing through the axis of the platen. The side pieces 126 are arranged on opposite sides of the type guide and on opposite sides of the printing point and are connected at their upper ends by a shouldered piece or cross bar 128 which has its ends riveted to said side pieces. The center paper guide thus constructed forms a rigid device which cannot be deflected or bent when cooperating with the work sheets. The rearwardly directed arm or finger 124 of the paper guide has a reduced end 129 which projects through an opening 130 in an upright link or actuating member 131. This link extends through an opening 132 in what corresponds to the top plate of the machine and extends downwardly below the shift rail 115 of the machine.

An off-set ear 133 is struck up from the link 131 at one side and to the rear thereof and is internally threaded for cooperation with a screw stop 134, the upper end of which is adapted to abut the forward fixed carriage rail 2 of the machine as shown in Fig. 6 in order to limit the upward movement of the link 131 and to limit the movement in one direction of the center paper guide 120 controlled thereby. The link 131 is likewise provided with struck up loop-like projections 135 and 136 which extend from opposite sides thereof and are internally threaded for cooperation with a screw stop 137 which co-acts with the contracted end 138 of an arm 139 rigidly connected by a screw 140 or otherwise with the shift rail

115. The contracted end 138 of the arm 139 passes freely through an opening 141 in the link 131 and is free to move in said opening between the screw stop 137 and the wall 142 of the opening 141. By this construction the center paper guide which is arranged near the printing point is rigidly maintained in position in either the upper or lower case position of the platen and the contact fingers 127 of the guide are maintained above the printing point and close to the platen at the same distance from the platen in both positions of the platen and in a position where they may engage the work sheet α to maintain it snug against the platen at or near the printing point so that there is no danger of blurring imprints being produced, irrespective of the thickness or stiffness of the work sheet employed. Thus, it will be seen that when the platen is in the lower case position shown in Fig. 2, the arm 139 will bear against the upper end of the screw stop 137, pulling down on the link 131 to maintain the contact fingers 127 of the center guide close to the platen as indicated in this figure and that any outward pressure exerted by the work sheet against the fingers is resisted by the arm 139 and the platen shifting mechanism to which it is connected. When, on the other hand, the platen is shifted to the upper case position shown in full lines in Fig. 6, an upward movement of the shift rail will cause the arm 139 to be elevated, thus releasing the link 131 so that the upper end of the paper guide may be moved forwardly by the platen as the platen is elevated so as not to interfere with the shifting movement of the platen. This outward movement of the upper end of the paper guide is limited by the screw stop 134 which bears against the forward fixed carriage rail 2 at the limit of the platen shifting movement, as shown in Fig. 6. When the upward movement of the platen has been completed the arm 139 will have been moved to the position shown in Figs. 5 and 6 where the contracted end 138 of the arm bears against the upper wall 142 of the slot 141 in the link, thus locking the link against downward movement. Thus, it will be seen that a lost motion connection is provided between the platen shifting mechanism and the center paper guide and by which the paper guide is rigidly locked against pivotal movement in one direction by the screw stop 134 bearing against the forward fixed carriage rail 2 and is locked against pivotal movement in the other direction by the arm 139 secured to the shift rail after the lost motion between the arm 139 and link 131 has been taken up. The adjustment of the screw stops 134 and 137 enables a nice regulation of the parts to be effected in order to properly maintain the paper guide locked against movement with its con-

tact fingers 127, situated at the proper distance from the platen in either the upper or lower case position. This means has been found to be particularly efficient for properly guiding work sheets, whatever may be the thickness thereof, and for properly maintaining a sheet snugly against the face of the platen at or near the printing point in order to prevent the production of blurring imprints.

So far as I am aware I am the first to provide a rigidly supported rigid paper guide carried by a fixed portion of the machine and coöperative with the platen above the printing line; I am likewise, so far as I am aware, the first to provide the combination of a shiftable platen, a paper guide carried by a fixed portion of the machine and coöperative with the platen above the printing line, and means coöperative with said paper guide for automatically moving it when the platen is shifted, and I wish to be understood as claiming such features broadly.

It is believed that the operation of the various devices will be understood from the foregoing description and that further detailed description of the operation is unnecessary.

Various changes may be made without departing from the spirit and scope of the invention.

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

1. In a typewriting machine, the combination of a rotative platen, and a rigid paper guide carried by a fixed portion of the machine and normally held rigid against the action of the work sheets thereon and coöperative with the platen above the printing line.

2. In a front-strike typewriting machine, the combination of a rotative platen, and a rigid paper guide carried by a fixed portion of the machine and normally held rigid against the action of the work sheets thereon and coöperative with the platen above the printing point and extending below the platen.

3. In a typewriting machine, the combination of a cylindrical shiftable platen, a paper guide carried by a fixed portion of the machine, and means for automatically moving said paper guide relatively to the platen when the platen is shifted.

4. In a typewriting machine, the combination of a cylindrical shiftable platen, a rigid paper guide carried by a fixed portion of the machine and coöperating with the platen above the printing line, said guide being normally held rigid against the action of the work sheets thereon and means for automatically moving said paper guide relatively to the platen when the platen is shifted.

5. In a typewriting machine, the combination of a cylindrical shiftable platen, a paper guide carried by a fixed portion of the machine, and means whereby said paper
5 guide is automatically moved toward and away from the platen when the platen is shifted.

6. In a typewriting machine, the combination of a cylindrical shiftable platen, a
10 paper guide carried by a fixed portion of the machine, and means whereby said paper guide is moved automatically away from the platen when the latter is shifted for upper case writing and for automatically moving
15 the paper guide toward the platen when the platen is shifted for lower case writing and for holding the guide rigidly in either of the said positions to which it is moved.

7. In a typewriting machine, the combination of a cylindrical shiftable platen, a
20 rigid paper guide cooperating with the platen above the printing line and carried by a fixed portion of the machine, said guide being normally held rigid against the action
25 of the work sheets thereon, and means for automatically moving said guide relatively to the platen during the shifting movements of the platen so that the guide will be adjacent to the platen and will be at the same
30 distance therefrom in both the upper and lower case position of the platen and will not interfere with the case shifting movements of the platen.

8. In a typewriting machine, the combination of a platen, case shifting mechanism therefor, a paper guide carried by a fixed
35 portion of the machine, and means for automatically shifting said paper guide relatively to the platen when the platen is shifted and for maintaining the guide rigid
40 in its shifted position.

9. In a typewriting machine, the combination of a platen, case shifting mechanism therefor, a paper guide carried by and pivoted to a fixed portion of the machine, and
45 means for automatically turning said paper guide on its pivot when the platen is shifted and for maintaining the guide rigid in the position to which it is turned.

10. In a typewriting machine, the combination of a platen, a shift rail therefor, a paper guide pivoted to a fixed portion of the machine, and intermediate connections
50 between said shift rail and paper guide.

11. In a typewriting machine, the combination of a platen, case shifting mechanism therefor, a paper guide carried by a fixed
55 portion of the machine, and connections between said paper guide and case shifting mechanism, said connections including means for affording a lost motion between the
60 parts.

12. In a typewriting machine, the combination of a platen, case shifting mechanism therefor, a paper guide carried by a fixed
65

portion of the machine, connections between said paper guide and case shifting mechanism, and adjustable means for regulating the control of the paper guide by said case shifting means.

13. In a typewriting machine, the combination of a platen, case shifting mechanism therefor, a paper guide carried by a fixed
70 portion of the machine, connections between said paper guide and case shifting mechanism, said connections including means for affording a lost motion between the parts, and adjustable means for regulating the effect of said lost motion.

14. In a typewriting machine, the combination of a platen, a shift rail therefor, a paper guide movably mounted on a fixed
80 portion of the machine, and a link between said shift rail and paper guide.

15. In a typewriting machine, the combination of a platen, a shift rail therefor, a paper guide movably mounted on a fixed
85 portion of the machine, a link between said shift rail and paper guide, and a set screw for limiting the movement of the link in one
90 direction.

16. In a typewriting machine, the combination of a platen, a shift rail therefor, a paper guide movably mounted on a fixed
95 portion of the machine, a link between said shift rail and paper guide, a set screw for limiting the movement of the link in one direction, and a set screw intermediate said shift rail and link.

17. In a typewriting machine, the combination of a platen, a shift rail therefor, a paper guide movably mounted on a fixed
100 portion of the machine, a link between said shift rail and paper guide, and a lost motion connection between said shift rail and
105 link.

18. In a typewriting machine, the combination of a platen, means for shifting the platen, a paper guide carried by a fixed
110 portion of the machine, and means for automatically moving the paper guide when the platen is shifted and for locking the paper guide at the end of the platen shifting movement.

19. In a typewriting machine, the combination of a platen, means for shifting the platen, a paper guide carried by a fixed
115 portion of the machine, means for automatically moving the paper guide when the platen is shifted and for locking the paper guide at the end of the platen shifting movement, and adjustable means for regulating the locking of the paper guide.

20. In a typewriting machine, the combination of a platen, a type guide, and a paper
125 guide carried by and movable on said type guide.

21. In a typewriting machine, the combination of a platen, a type guide, a rigid
130 paper guide carried by and movable on said

type guide, and means for normally holding said paper guide against movement.

22. In a typewriting machine, the combination of a shiftable platen, a type guide, a paper guide carried by and movable on said type guide, and means for automatically moving said paper guide when the platen is shifted.

23. In a typewriting machine, the combination of a platen shiftable for upper and lower case writing, a type guide, a paper guide carried by and movable on said type guide, means for automatically moving said paper guide when the platen is shifted, and means for locking the paper guide against movement when the platen is in either the upper or lower case position.

24. In a typewriting machine, the combination of a platen, a shift rail therefor, a type guide, a paper guide pivoted to said type guide, and connections between said paper guide and shift rail.

25. In a typewriting machine, the combination of a platen, a shift rail therefor, a type guide, a paper guide pivoted to said type guide, connections between said paper guide and shift rail, a set screw for limiting the movements of the parts in one direction, and a set screw in the connections between the shift rail and paper guide.

26. In a typewriting machine, the combination of a rotative platen, means for shifting the platen for upper and lower case writing, a rigid paper guide mounted on a fixed portion of the machine, and connections between said paper guide and the platen shifting mechanism, said connections comprising an arm rigidly mounted on the platen shifting mechanism, a slotted link connected with the paper guide and through the slot in which said arm extends, a screw carried by said link and with which said arm contacts, and a screw stop carried by said link and coöperative with a fixed portion of the machine.

27. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar situated above the platen and supported by the platen frame, a substantially horizontally disposed arm carried by said rod and extending over the platen, a substantially vertically disposed arm pivoted to and depending from said first mentioned arm at substantially right angles thereto, a feed roller carried by said substantially vertically disposed arm, and a paper finger carried by said substantially vertically disposed arm.

28. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar situated above the platen and supported by the platen frame, a substantially horizontally disposed arm carried by said rod and extending over the platen, a substantially vertically disposed spring-pressed

arm pivoted to and depending from said first mentioned arm at substantially right angles thereto, a feed roller carried by said substantially vertically disposed arm, and a paper finger which is carried by said substantially vertically disposed arm and which extends tangentially to said platen.

29. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar situated above the platen and supported by the platen frame, a substantially horizontally disposed arm carried by and adjustable along said rod and extending over the platen, a substantially vertically disposed arm pivoted to and depending from said first mentioned arm at substantially right angles thereto, a feed roller carried by said substantially vertically disposed arm, a spring for turning said substantially vertically disposed arm around its pivotal connection with the substantially horizontally disposed arm, and a flexible paper finger which is also carried by said substantially vertically disposed arm and which is fixed thereto, said paper finger extending tangentially to said platen.

30. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar situated above the platen and supported by the platen frame, a substantially horizontally disposed arm carried by said rod and extending over the platen, a substantially vertically disposed arm pivoted to and depending from said first mentioned arm at substantially right angles thereto, and a feed roller carried by said substantially vertically disposed arm, said feed roller co-acting with the platen substantially along the printing line.

31. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar situated above the platen and supported by the platen frame, a substantially horizontally disposed arm carried by said rod and extending over the platen, a substantially vertically disposed arm pivoted to and depending from said first mentioned arm, a feed roller carried by said substantially vertically disposed arm, and a contractile spring connected at its forward end to said substantially vertically disposed arm and connected at its rear end to the support for said substantially horizontally disposed arm.

32. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar situated above the platen and supported by the platen frame, a substantially horizontally disposed arm carried by said rod and extending over the platen, a substantially vertically disposed arm pivoted to and depending from said first mentioned arm, a feed roller carried by said substantially vertically disposed arm, a contractile spring connected at its forward end to said substantially vertically disposed arm and at its

rear end to the support for said substantially horizontally disposed arm, and adjustable means co-acting with said spring to vary the tension thereof.

5 33. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar situated above the platen and supported by the platen frame, a substantially horizontally disposed arm carried by said rod and
10 extending over the platen, a substantially vertically disposed arm pivoted to and depending from said first mentioned arm, a feed roller carried by said substantially vertically disposed arm, a contractile spring
15 connected at its forward end to said substantially vertically disposed arm and at its rear end to the support for said substantially horizontally disposed arm, and adjustable means co-acting with said spring to vary
20 the tension thereof, said adjustable means comprising a block received in said spring and having a tapped opening therein, and a screw which turns freely in the part that carries it and which is received in the
25 threaded opening in said block.

34. In a front-strike typewriting machine, the combination of a rotative platen arranged to receive the impact of the types against the front face thereof, a platen
30 frame, a pivotally mounted paper feed roller supported from above the platen and adjustable longitudinally of said platen and contacting with the platen substantially at the printing line.

35 35. In a typewriting machine, the combination of a rotative platen, a depending pivoted arm, a paper feed roller carried by said arm, a contractile spring which extends fore and aft of the machine between said depend-
40 ing arm and the support therefor, and adjustable means for varying the tension of said spring on said arm.

36. In a typewriting machine, the combination of a rotative platen, a depending piv-
45 oted arm, a paper feed roller carried by said arm, a contractile spring which extends fore and aft of the machine between said depending arm and the support therefor, and adjustable means for varying the tension of
50 said spring on said arm, said adjustable means comprising a block received within said spring and having a tapped opening therein, and a screw which turns freely in the part that carries it and which is received
55 in the tapped opening in said block.

37. In a typewriting machine, the combination of a rotative platen, a support ad-
justable longitudinally of the platen, an arm pivoted to said support, a paper feed roller
60 carried on said arm, and a contractile spring intermediate said arm and support, one end of the spring being connected to said arm and the other end being connected with said support, and adjustable means for varying
65 the tension of said spring.

38. In a typewriting machine, the combination of a rotative platen, a support ad-
justable longitudinally of the platen, an arm pivoted to said support, a paper feed roller
70 carried by said arm, and a contractile spring intermediate said arm and support, one end of the spring being connected to said arm and the other end being connected with said support, one end of the spring being con-
75 nected by a ball and socket joint and the other by a screw.

39. In a typewriting machine, the combination of a rotative platen, a support ad-
justable longitudinally of the platen, an arm pivoted to said support, a paper feed roller
80 carried by said arm, and a contractile spring intermediate said arm and support, one end of the spring being connected to said arm and the other end being connected with said support, one end of the spring being de-
85 tachably connected by a slotted socket and ball and the other by a screw.

40. In a typewriting machine, the combination of a rotative platen, a support ad-
justable longitudinally of the platen, an arm
90 pivoted to said support, a paper feed roller carried by said arm, and a coiled spring intermediate said arm and support, a block received in convolutes of said spring at one end, said block having a tapped opening
95 therein, and a screw received in said tapped openings.

41. In a typewriting machine, the combination of a rotative platen, a support ad-
justable longitudinally of the platen, an arm
100 pivoted to said support, a paper feed roller carried by said arm, and a coiled spring intermediate said arm and support, blocks received in the convolutes of said spring one at each end, one of said blocks having a
105 tapped opening therein, and a screw received in said tapped opening, said screw turning freely in the part that carries it to effect a variation of the tension of said spring, and the other of said blocks having a rounded
110 or ball-like head received in a like socket.

42. In a typewriting machine, the combination of a platen, a platen frame, a bar angular in cross-section and supported on
the platen frame, a substantially U-shaped
115 slide adapted to move along said bar, an arm carried by said slide, a paper feed device pivoted to said arm, and a contractile spring that is connected at one end to said slide and at the other end to said pivoted
120 device.

43. In a typewriting machine, the combination of a platen, a platen frame, a bar angular in cross-section and supported on
the platen frame, a substantially U-shaped
125 slide adapted to move along said bar, a paper feed device carried by said slide, and a removable member that passes between the arms of the slide and prevents its removal from said bar.
130

44. In a typewriting machine, the combination of a platen, a platen frame, a bar angular in cross-section and supported on the platen frame, a substantially U-shaped slide adapted to move along said bar, an arm carried by said slide, a paper feed device pivoted to said arm, and a contractile spring that is operatively connected at one end to said paper feed device, and a screw which passes between the arms of the slide and which is connected to the other end of said spring.

45. In a typewriting machine, the combination of a platen, a platen frame, a bar angular in cross-section and supported on the platen frame, a substantially U-shaped slide adapted to move along said bar, an arm carried by said slide, a paper feed device pivoted to said arm, a contractile spring that is connected at one end to said paper feed device, a screw which passes between the arms of the slide and which turns freely in openings in said arms, and a block received in the other end of said spring and having a tapped opening therein for coöperation with said screw, whereby the removal of the slide from said rod is prevented and the tension of the spring may be varied by said screw.

46. In a typewriting machine, the combination of a rotative platen, a paper apron having a stud projecting therefrom, and a spring-pressed arm having an aperture in which said stud is loosely received.

47. In a typewriting machine, the combination of a rotative platen, a paper apron having a stud projecting therefrom, a pivoted rigid arm having an aperture in which said stud is loosely received, a spring co-operative with said arm, and adjustable means for varying the tension of said spring.

48. In a typewriting machine, the combination of a rotative platen, a paper apron, and means for detachably supporting the paper apron in place, said means comprising studs which project downwardly from the paper apron, and upwardly bearing spring-pressed arms having apertures in which said studs are loosely received.

49. In a typewriting machine, the combination of a rotative platen, a paper apron, and means for detachably supporting the paper apron in place, said means comprising studs which project downwardly from the paper apron, a stud being situated near each end of the paper apron, and pivoted spring-pressed arms having apertures in which said studs are loosely received and which bear upwardly against the bottom of the paper apron to support it in position.

50. In a typewriting machine, the combination of a rotative platen, a paper apron, and means for detachably supporting the paper apron in place, said means comprising studs which project downwardly from the

paper apron, a stud being situated near each end of the paper apron, rigid pivoted arms having apertures in which said studs are loosely received and which bear upwardly against the bottom of the paper apron to support it in position, individual springs one for each of said pivoted arms, and individual adjusting means for each of said springs.

51. In a typewriting machine, the combination of a rotative platen, a paper apron that extends substantially throughout the length of the platen, and means for detachably supporting said paper apron, said means comprising a plurality of studs which project from the bottom of the paper apron, and apertured upwardly pressing spring-pressed arms, said studs being received and loosely disposed in the apertures in said arms and the arms constituting the sole support for the paper apron.

52. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar pivoted to the platen frame, said bar being angular in cross-section, a rigid slide fitted to said bar so as to turn therewith but adapted to slide along the bar, a substantially horizontally disposed arm rigidly connected with said slide, a second arm that is pivoted to the first mentioned arm, said second arm being substantially vertically disposed and a feed roller carried by said second arm.

53. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar pivoted to the platen frame, said bar being angular in cross-section, a slide fitted to said bar so as to turn therewith but adapted to slide along the bar, a substantially horizontally disposed arm rigidly connected with said slide, a second arm that is pivoted to the first mentioned arm, said second arm being substantially vertically disposed, a feed roller carried by said second arm, a spring intermediate said slide and second arm, and a finger piece carried by said second arm and by means of which the second arm may be turned against the tension of its spring.

54. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar pivoted to the platen frame, said bar being angular in cross-section, a rigid slide fitted to said bar so as to turn therewith but adapted to slide along the bar, a substantially horizontally disposed arm rigidly connected with said slide, a second arm that is pivoted to the first mentioned arm, said second arm being substantially vertically disposed, a feed roller carried by said second arm, and locking means for positively locking said bar against rotative movement.

55. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar pivoted to the platen frame, said bar

being angular in cross-section, a rigid slide fitted to said bar so as to turn therewith but adapted to slide along the bar, a substantially horizontally disposed arm rigidly connected with said slide, a second arm that is pivoted to the first mentioned arm, said second arm being substantially vertically disposed, a feed roller carried by said second arm, and locking means for locking said bar against rotative movement, said locking means comprising a movable spring-pressed bolt, and engaging means for cooperation therewith.

56. In a typewriting machine, the combination of a rotative platen, a platen frame, a bar pivoted to the platen frame, said bar being angular in cross-section, a rigid slide fitted to said bar so as to turn therewith but adapted to slide along the bar, a substantially horizontally disposed arm rigidly connected with said slide, a second arm that is pivoted to the first mentioned arm, said second arm being substantially vertically disposed, a feed roller carried by said second arm, and locking means for locking said bar against rotative movement, said locking means comprising an endwise movable spring-pressed bolt having a lateral projection that is adapted to engage in a locking recess in said bar, and a finger piece on said bolt for manipulating it.

57. In a typewriting machine, the combination of a rotative platen, a platen frame, a pivoted supporting bar carried by the platen frame, paper feed devices carried by said bar, and locking means for locking the bar against pivotal movement, said locking means comprising an endwise movable spring-pressed bolt having a lateral projection that is adapted to engage in a locking recess in said bar, and a finger piece on said bolt for manipulating it.

58. In a typewriting machine, the combination of a platen, pivoted feed roll hangers carrying feed rolls, a bar which extends transversely of and engages said hangers, said bar being pivoted concentrically with said hangers, and hand actuated means for giving said bar a bodily transverse movement to move the hangers and thus release the feed rolls.

59. In a typewriting machine, the combination of a platen, pivoted feed roll hangers carrying feed rolls, a bar which extends transversely of and engages said hangers, said bar being segmental in cross-section and bearing at one edge against said hangers, the bar being also pivoted concentrically with the hangers, and hand-actuated means for giving said bar a bodily transverse movement to move the hangers and thus release the feed rolls.

60. In a typewriting machine, the combination of a platen, a series of independently

movable hangers each consisting of a two-arm lever pivoted intermediate of its ends in the rear of the platen, a shaft carried by the lever arms at one side of the pivot of said hangers, a series of feed rollers carried by said shaft, and a series of coiled springs connected to the other set of lever arms of said hangers.

61. In a typewriting machine, the combination of a platen, a series of independently movable hangers each consisting of a two-arm lever pivoted intermediate of its ends in the rear of the platen, a shaft carried by the lever arms at one side of the pivot of said hangers, a series of feed rollers carried by said shaft, a series of coiled springs connected to the other set of lever arms of said hangers, and individual adjusting means for said springs to effect a variation in the tension thereof.

62. In a typewriting machine, the combination of a platen, a series of independently movable hangers each consisting of a two arm lever pivoted intermediate of its ends, a series of feed rollers carried by the lever arms at one side of the pivot of said hangers, a series of coiled springs connected to the other set of lever arms of said hangers, individual adjusting means for said spring to effect a variation in the tension of the springs, said adjusting means for each spring comprising a block received within the associated spring and having a tapped opening therein, and a screw having a rounded head, said screw being threaded into the tapped opening in the block and having its rounded head seated in a corresponding recess in the part that carries it.

63. In a typewriting machine, the combination of a platen, a series of independently movable hangers each consisting of a two-arm lever pivoted intermediate of its ends in the rear of the platen, a shaft carried by the lever arms at one side of the pivot of said hangers, a series of feed rollers carried by said shaft, a series of coiled springs connected to the other set of lever arms of said hangers, a bar which extends transversely of and engages said hangers, and hand actuated means for giving said bar a bodily transverse movement to move the hangers and thus release the feed rollers.

64. In a typewriting machine, the combination of a platen, a series of independently movable hangers each consisting of a two arm lever pivoted intermediate of its ends, a series of feed rollers carried by the lever arms at one side of the pivot of said hangers, a series of coiled springs connected to the other set of lever arms of said hangers, a bar which extends transversely of and engages said hangers, said bar being pivoted concentrically with the hangers, and hand actuated means for giving said bar a

bodily transverse movement to move the hangers and thus release the feed rollers.

65. In a typewriting machine, the combination of a platen, a platen frame comprising end plates and a connecting rod, feed roll hangers pivoted on said rod, a feed roll release bar also pivoted on and carried by said rod independently of the feed roll hangers, said release bar being disconnected from but coöperative with said hangers, and

supports for a paper table carried by said rod.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 2nd day of May A. D. 1908. 15

OSCAR WOODWARD.

Witnesses:

CHARLES E. SMITH,
J. B. DEEVES.