

W. J. BARRON & H. W. MERRITT.

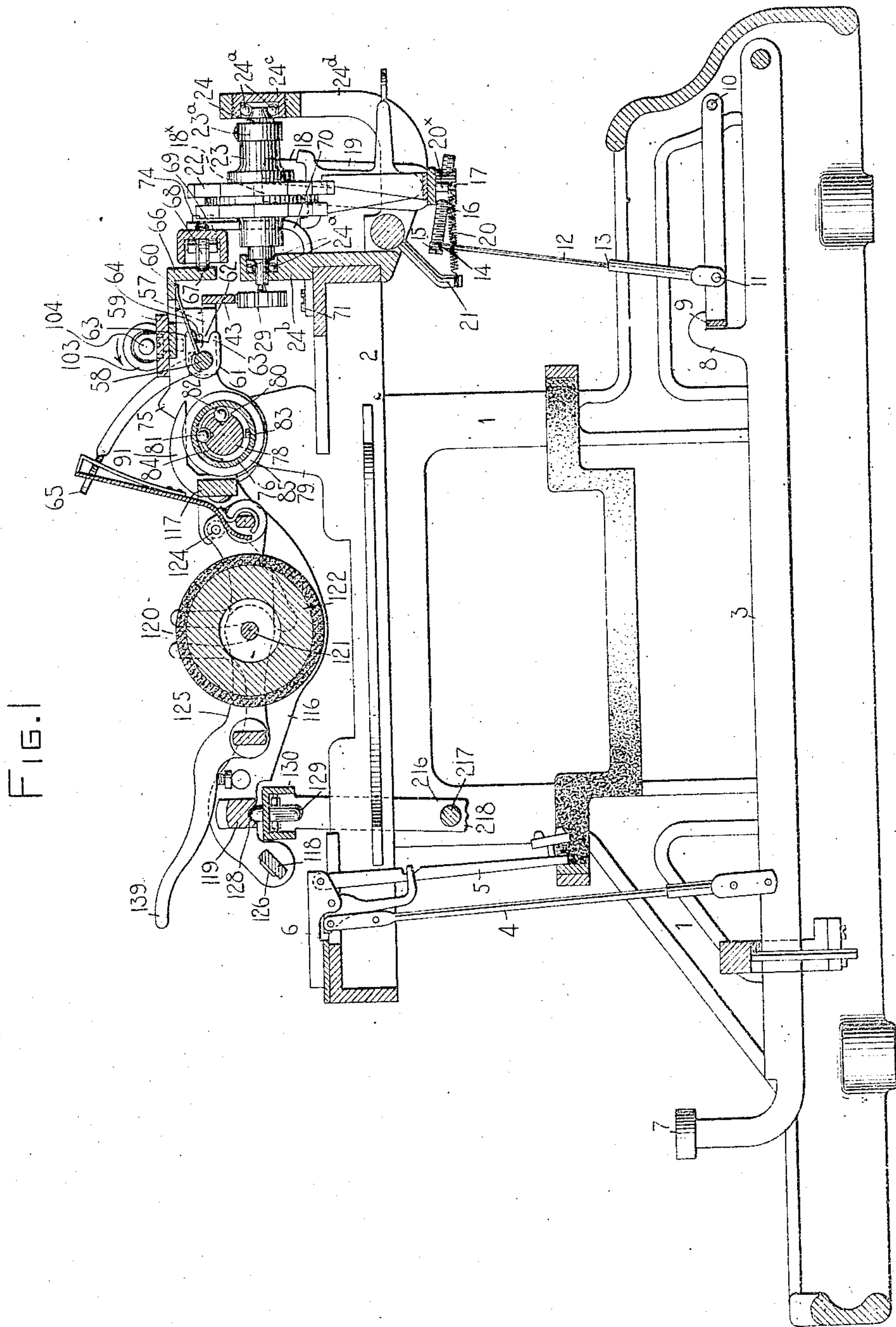
TYPE WRITING MACHINE.

APPLICATION FILED FEB. 6, 1902.

943,644.

Patented Dec. 21, 1909.

4 SHEETS—SHEET 1.



WITNESSES=

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INVENTORS =

*Walter J. Barron & Henry W. Merritt*

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THEIR ATTORNEY

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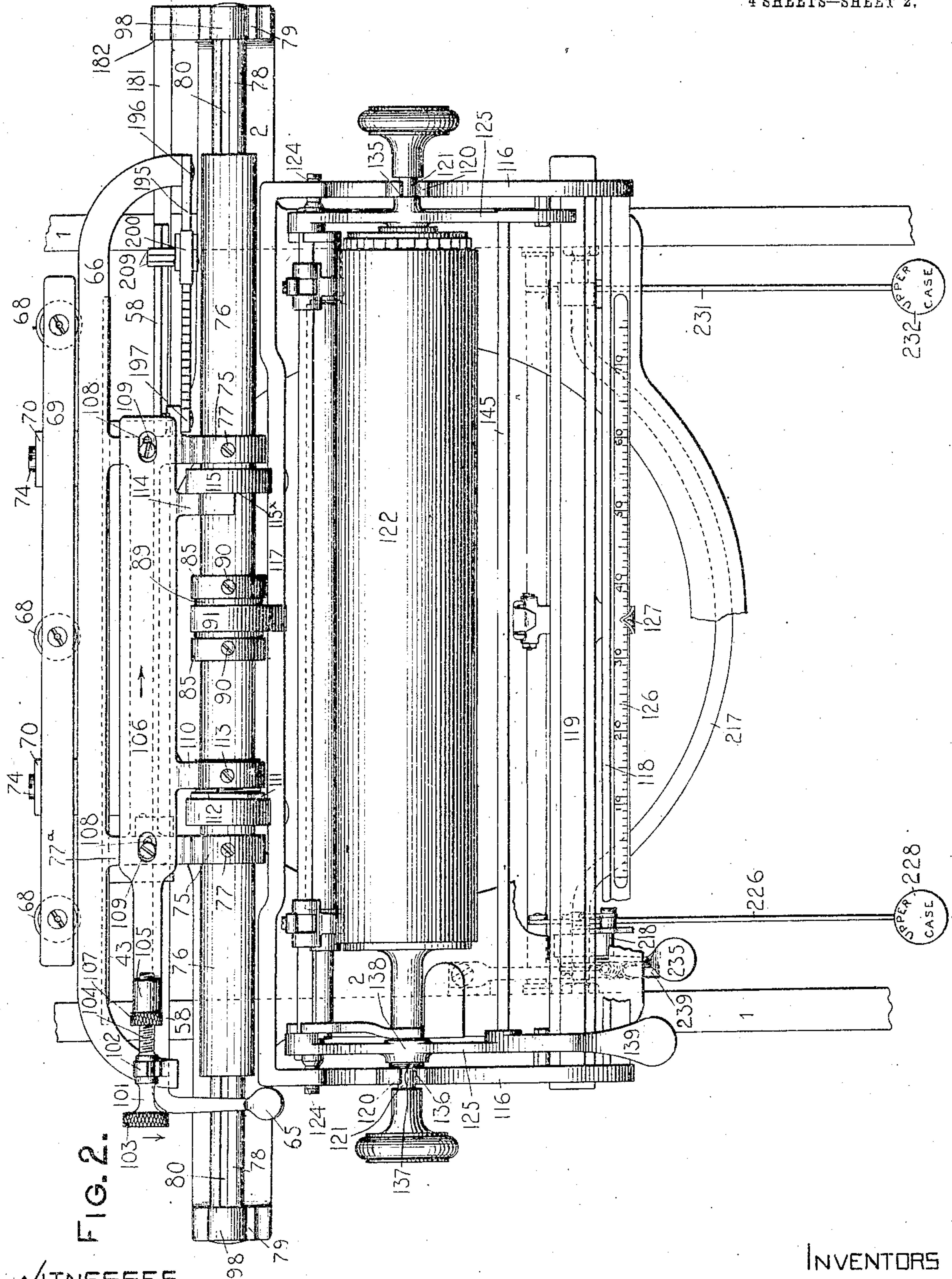


FIG. 2.

WITNESSES

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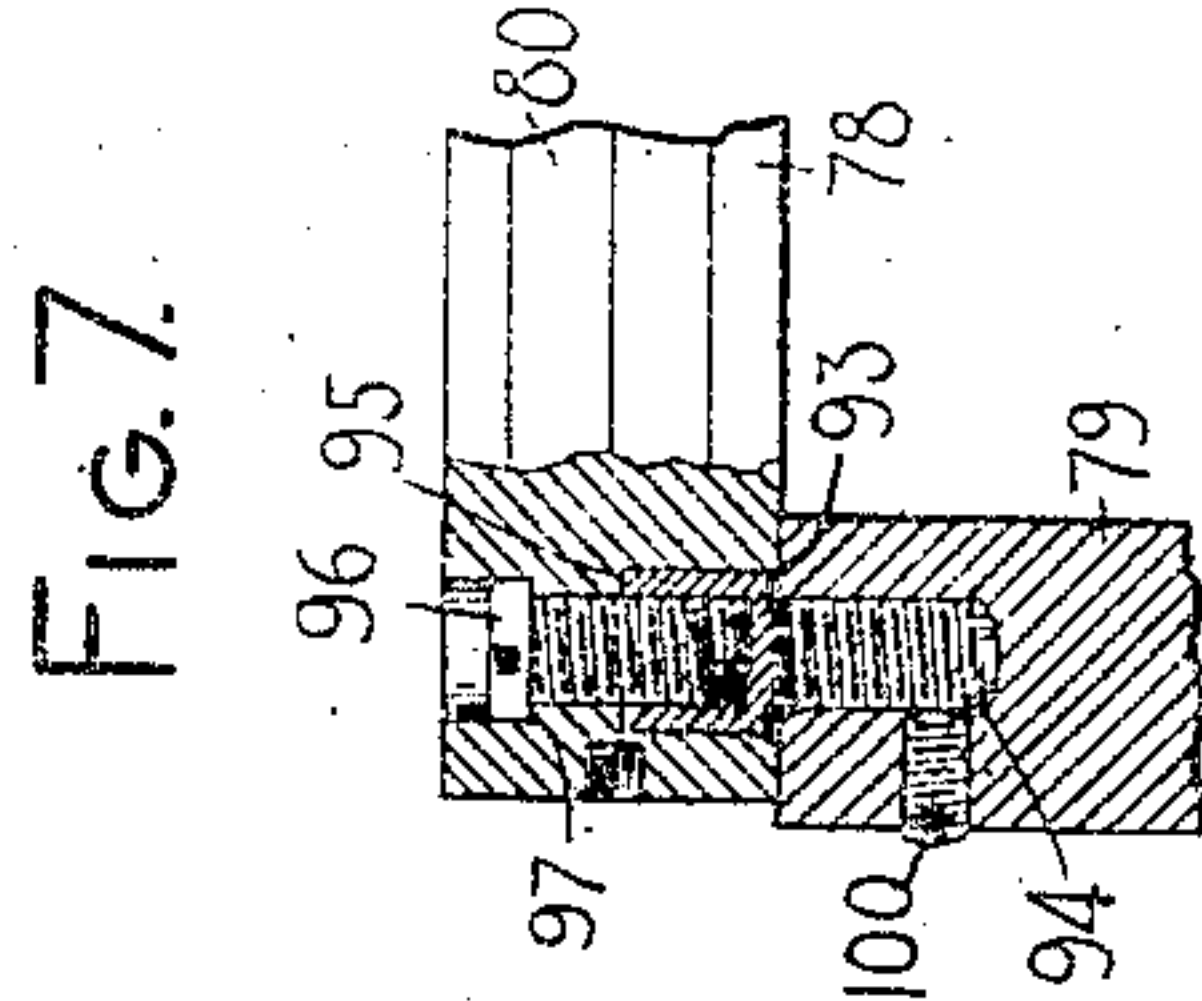
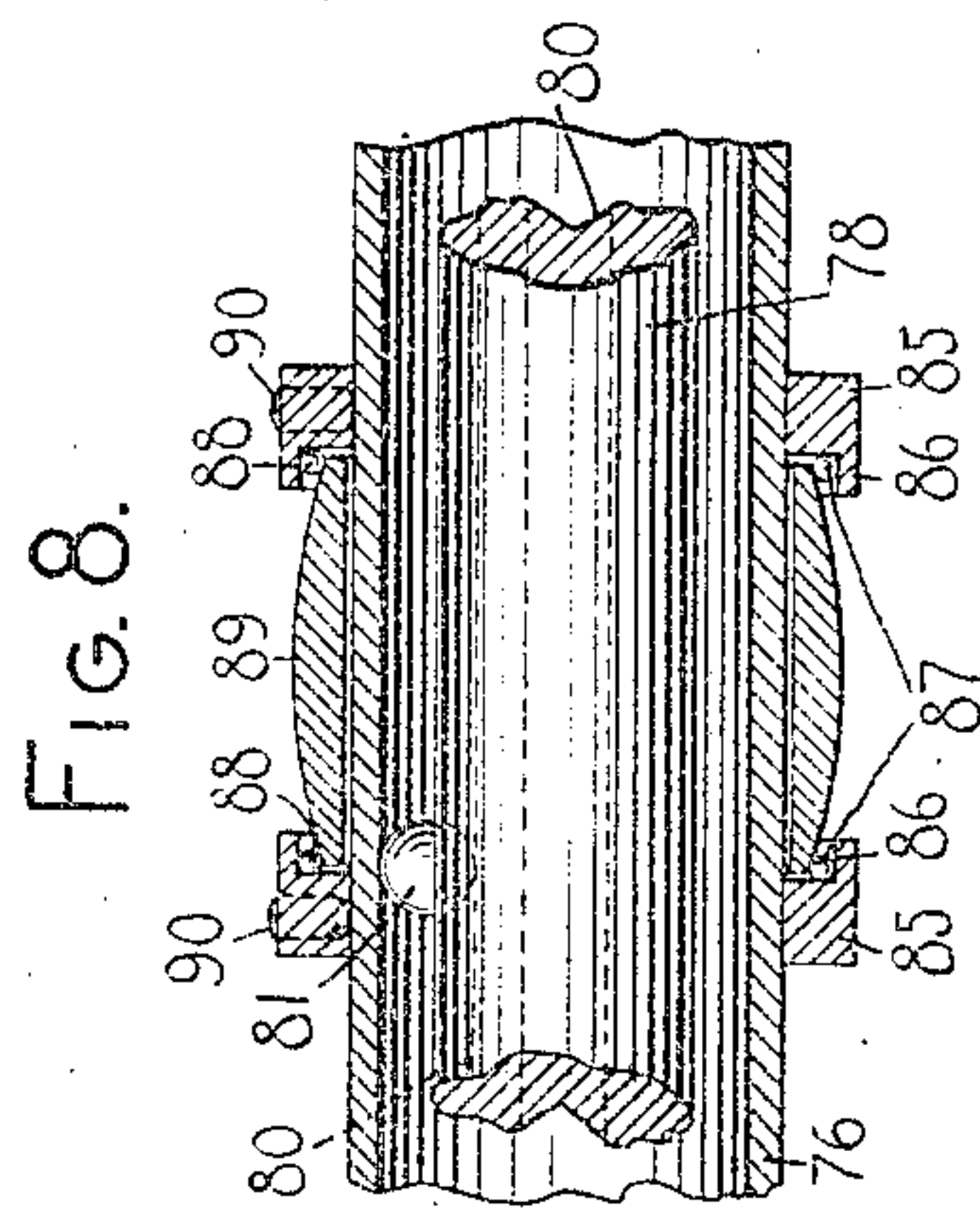
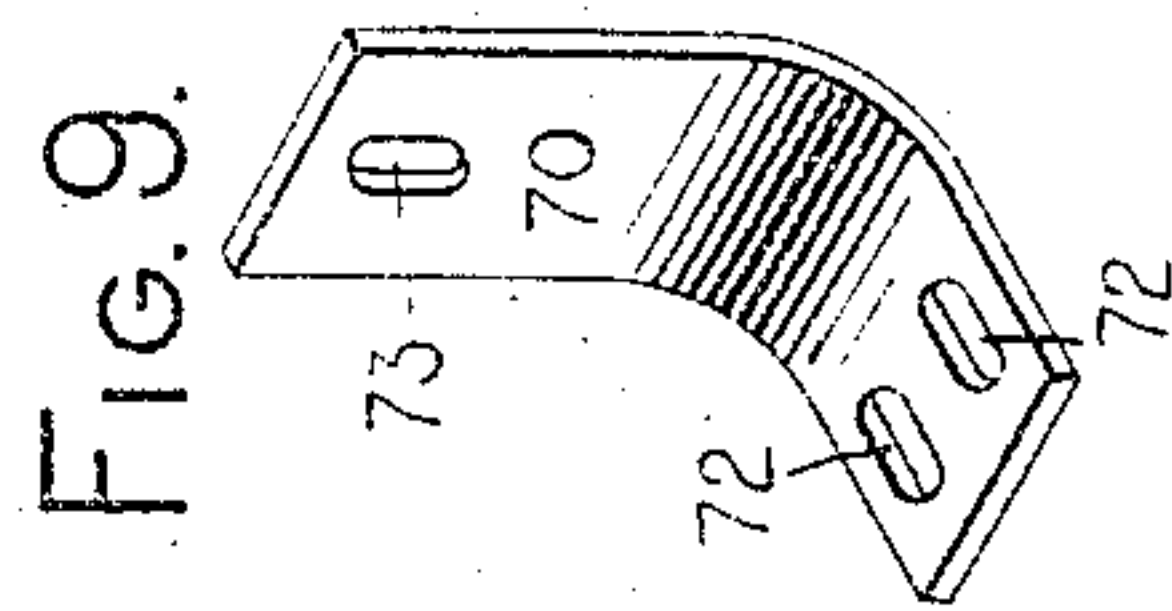
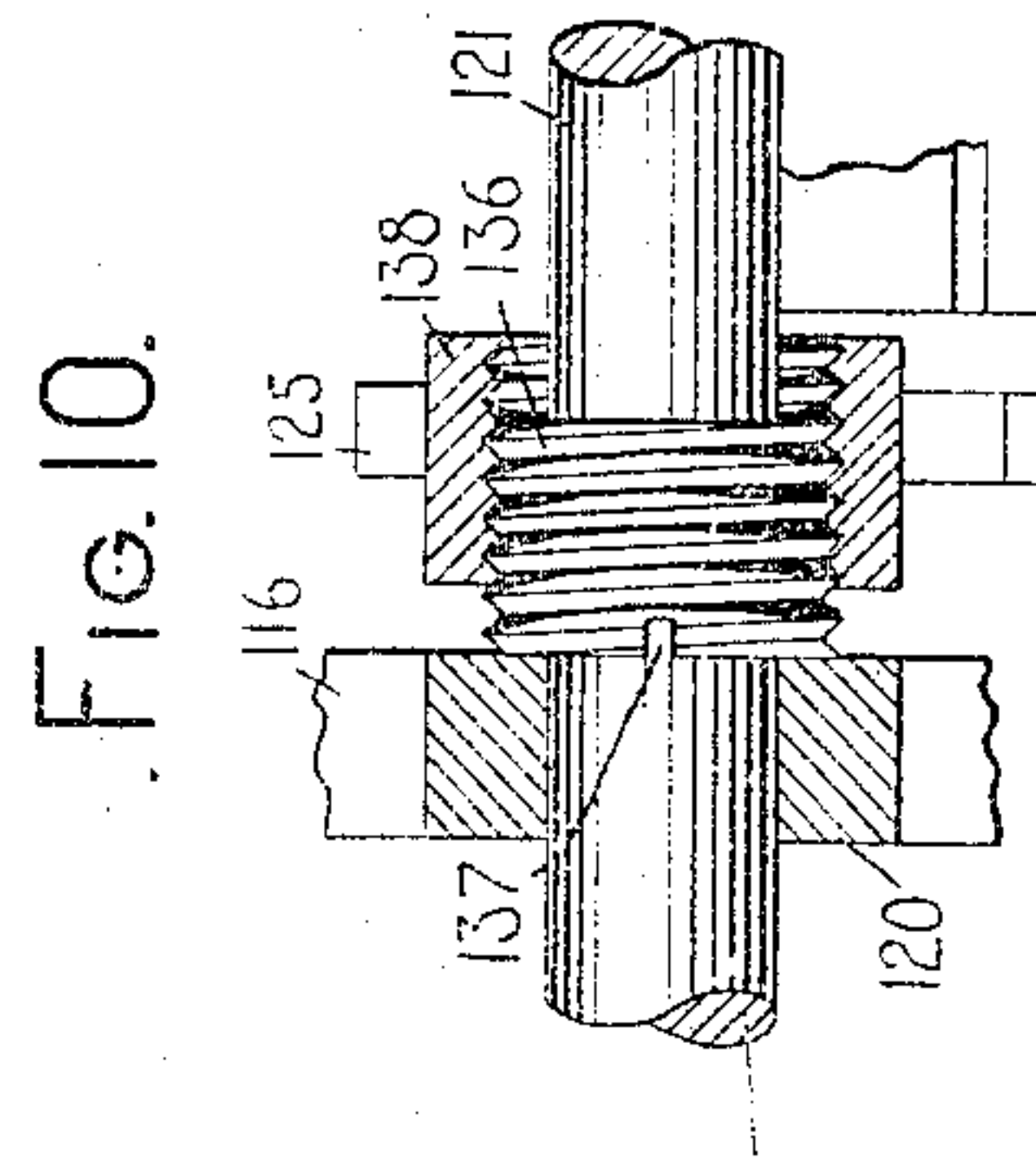
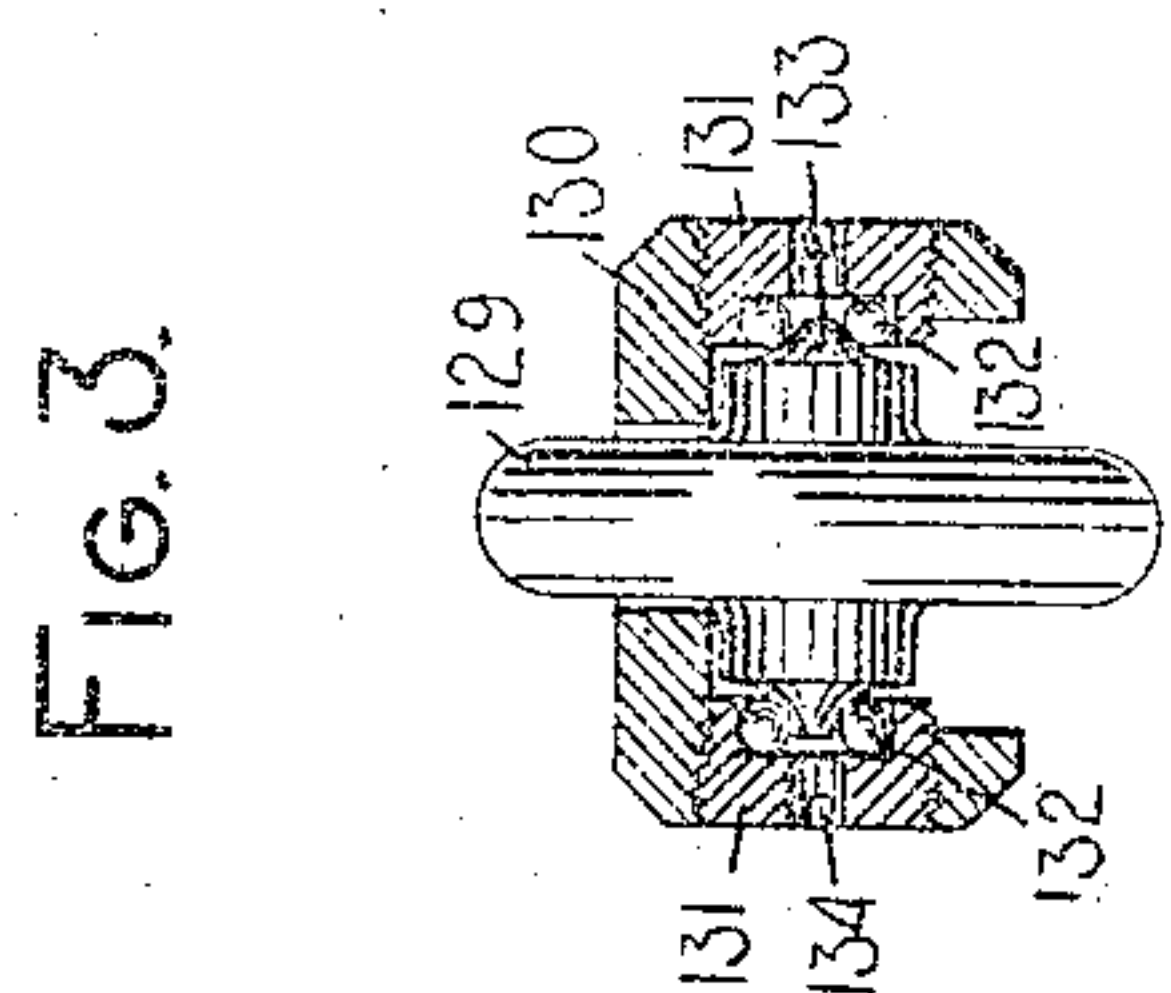
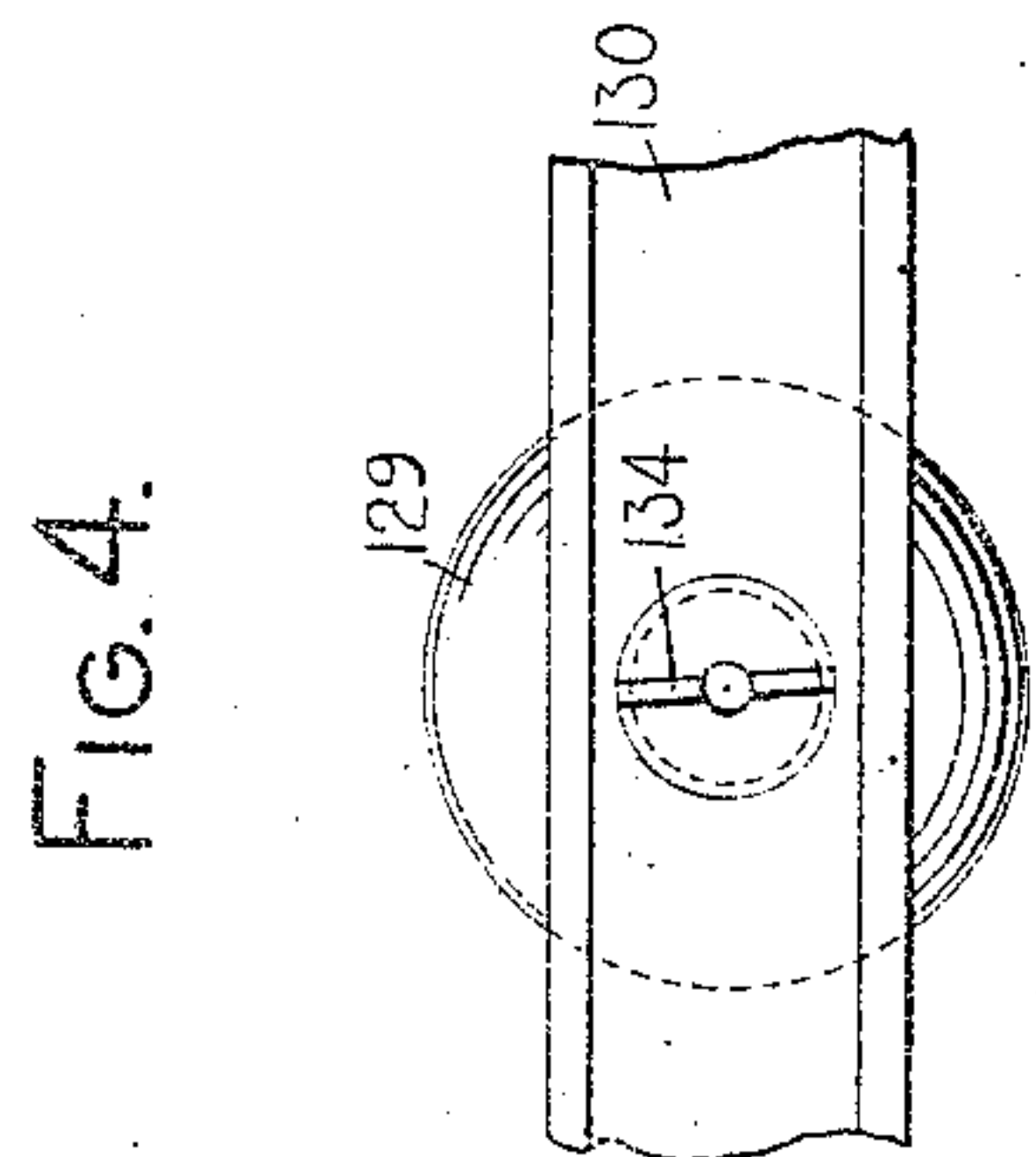
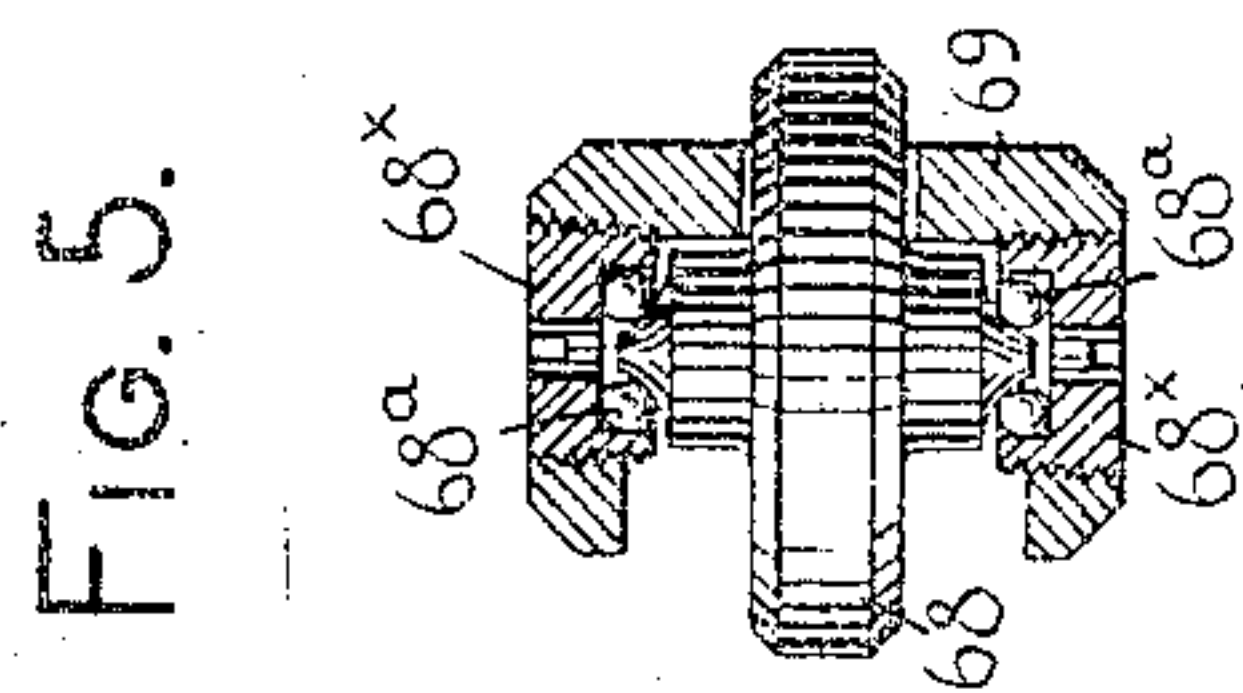
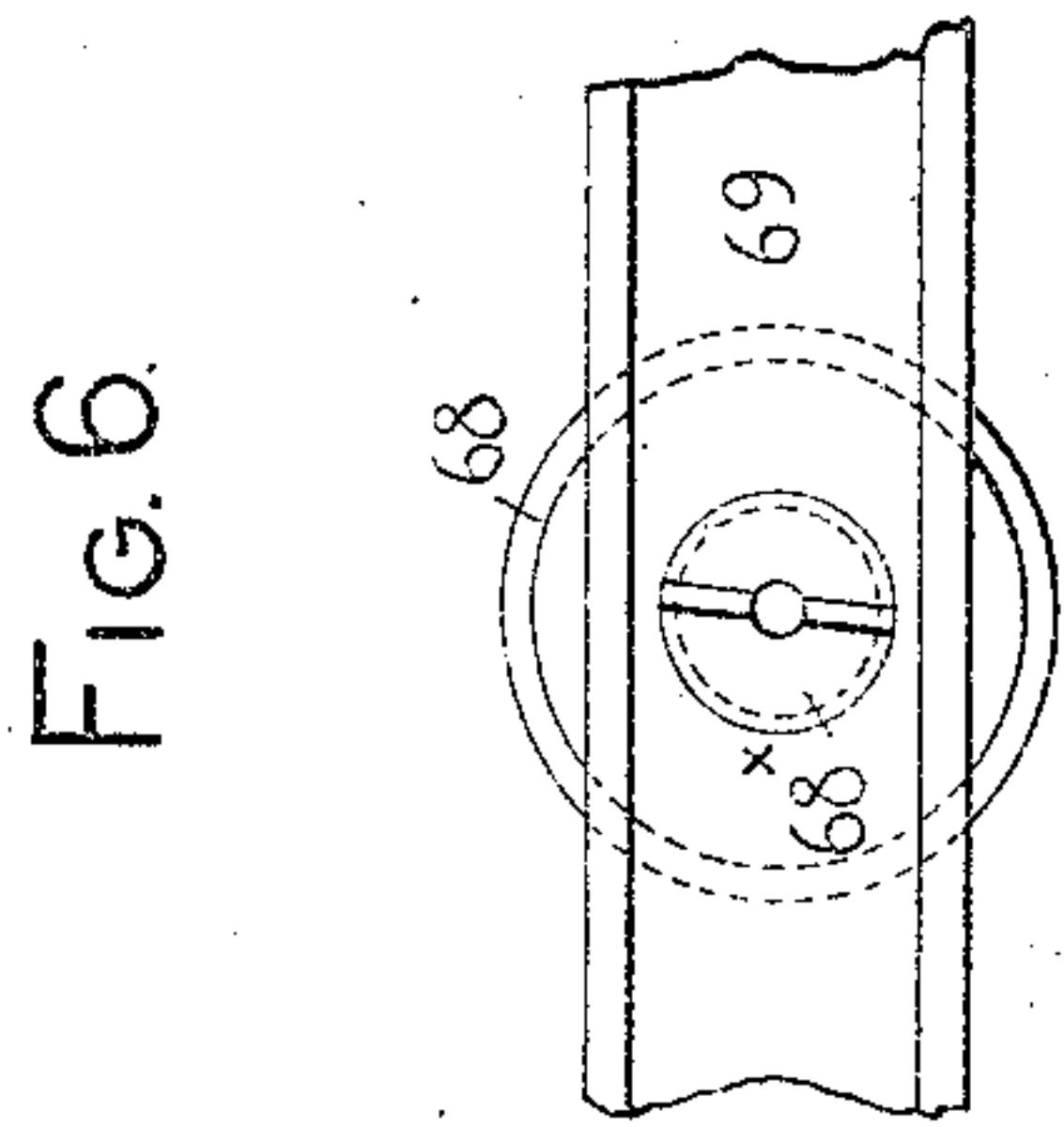
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4 SHEETS—SHEET 3.



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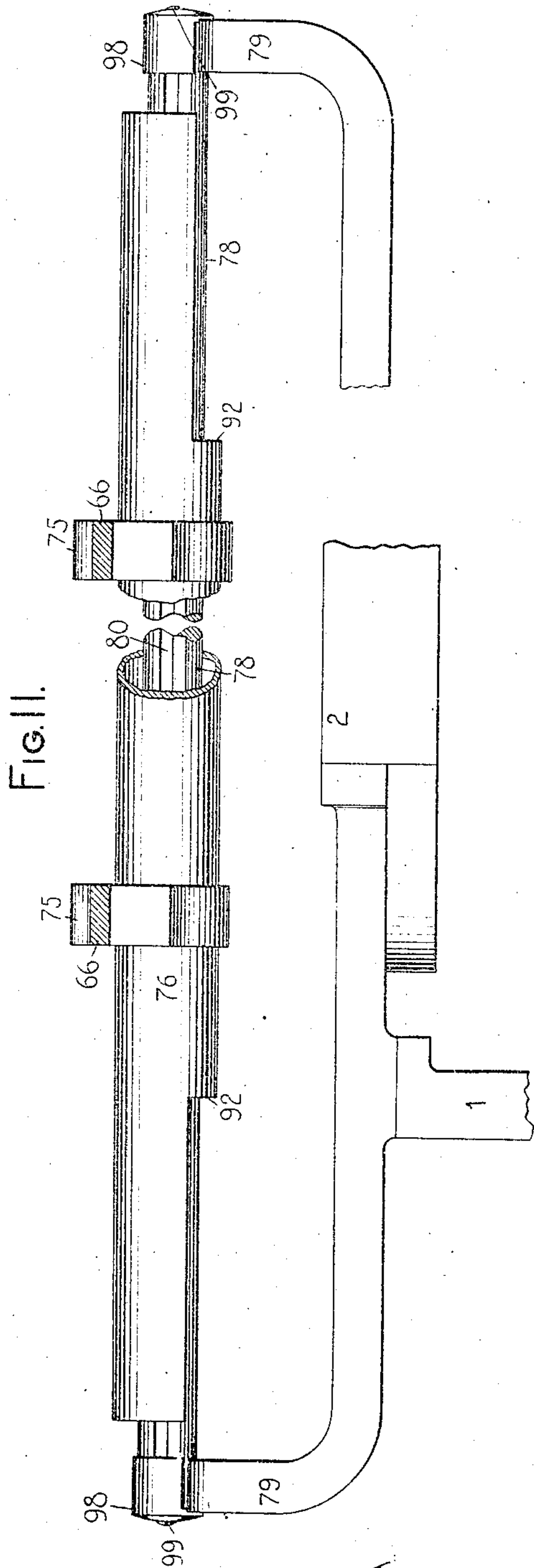
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WITNESSES:

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# UNITED STATES PATENT OFFICE.

WALTER J. BARRON, OF NEW YORK, N. Y., AND HENRY W. MERRITT, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNORS TO DENSMORE TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

## TYPE-WRITING MACHINE.

943,644.

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed February 6, 1902. Serial No. 92,339.

*To all whom it may concern:*

Be it known that we, WALTER J. BARRON and HENRY W. MERRITT, citizens of the United States, and residents, respectively, of borough of Brooklyn, county of Kings, city of New York, and State of New York, and of Springfield, county of Hampden, and State of Massachusetts, have invented certain new and useful Improvements in Type-  
5 Writing Machines, of which the following is a specification.

Our invention relates to typewriting machines and is directed more particularly to the carriage mechanism, with a view to providing freely moving parts and wherein the parts may be nicely adjusted and an efficient carriage mechanism and easy running carriage produced, thus contributing to the speedier and more efficient operation of the  
15 machine as a whole.

To these and other ends which will hereinafter appear, our invention consists in the novel construction of features, arrangements of parts and combinations of elements to be  
25 hereinafter described and claimed.

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the various views:—Figure 1 is a front to rear vertical sectional view of  
30 sufficient number of parts of one form of typewriting machine to illustrate our invention. Fig. 2 is a plan view of the machine with certain parts broken away and others omitted. Fig. 3 is a vertical cross  
35 section of the shift rod, or rail, taken at one of its rollers or wheels. Fig. 4 is a fragmentary front view of the same. Fig. 5 is a transverse vertical section of the rear roller-bearing guide rail. Fig. 6 is a fragmentary top plan view of the same. Fig. 7  
40 is an enlarged fragmentary detail vertical sectional view of the adjusting means for the traverse rod. Fig. 8 is a detail fragmentary longitudinal sectional view of the carriage sleeve and the bearing sleeve. Fig. 9 is a detail perspective view of one of the supporting brackets for the rear roller-bearing  
45 or guide-rail. Fig. 10 is an enlarged fragmentary detail sectional view of the means for taking up lost motion of the platen frame. Fig. 11 is a detail rear view of the carriage sleeve and the cooperating supporting or traverse rod.

We have shown the various features of

our invention applied to a "Densmore" typewriting machine, but it should be understood that they, or any one or more of them, may be employed in other characters of typewriting machines.

1 designates the main frame of the machine, 2 the usual top plate and 3 the key levers which are connected by links 4, in a suitable manner, to actuate the type bars 5, which are pivoted to hangers 6 secured to the top plate 2. Each of the key levers 3 is  
60 provided with the usual finger key 7 and with a hook 8 which bears upon a transverse universal bar 9, that has a rearwardly extending arm at each end which is pivoted to the frame of the machine at 10.

Pivoted to the universal bar 9 at 11 is a link 12 preferably made of two parts, which may be adjustably united by screw threaded connections 13. The upper end of this link 12 is provided with an eye 14 that engages  
70 a notched portion 15 of an arm 16, which is preferably in the form of a screw, that extends through a threaded hole in a depending stud 17 of the dog rocker, whereby the said arm may be adjusted to bring the inner  
75 end thereof closer to or to move it farther from the pivotal center of the rocker, in order to vary or regulate the throw imparted to the rocker and the feed dogs carried thereby. The adjustment 13 enables  
80 the link 12 to be lengthened or shortened in accordance with the adjustment of the arm 16.

The feed dogs 18 18<sup>x</sup> and their rocker 19 after actuation are returned to normal position by a spring 20, which is suitably connected at one end to an arm 20<sup>x</sup> on the rocker (see Fig. 1) and at its other end to a fixed arm 21 on the machine frame. The feed dogs 18 and 18<sup>x</sup> cooperate with a feed wheel  
85 22, which is secured to a sleeve 23 that surrounds and is loosely carried upon a shaft 24, and is prevented from moving longitudinally thereon in one direction by a sleeve 23<sup>a</sup> which is secured to the shaft 24 by a set  
90 screw.

The shaft 24 has cone bearings at its ends which cooperate with anti-friction balls 24<sup>a</sup> (see Fig. 1) which revolve in circular raceways. One raceway is formed in a bracket  
95 24<sup>b</sup> that is secured to the top plate 2 of the machine, and the other raceway is formed in a screw-threaded adjustable plug 24<sup>c</sup> that



takes into a threaded opening in the bracket arm 24<sup>a</sup> which forms part of the bracket 24<sup>b</sup>. By these means an efficient ball bearing support is provided for the shaft 24 and the plug 24<sup>a</sup> may be turned by a screw driver, (a slot being provided in the plug for this purpose) to compensate for any wear that may take place in the balls or the bearings.

The shaft 24 is connected to a feed pinion 29 which meshes with a feed rack 43 that is carried by the carriage. The feed rack is mounted upon arms 57 that project from a rock shaft 58 to which is secured a leaf spring 59 (see Fig. 1), the free end of which bears against a portion of the carriage, as shown at 60, in order to maintain the feed rack 43 normally in engagement with its co-operating feed pinion 29. The rock shaft 58 is likewise provided with a lug 61 which is bifurcated at 62, so as to provide stops 63 that coöperate with a fixed pin 64 carried upon the carriage, in order to limit the oscillation of the rock shaft.

The rock shaft 58 has a finger-piece or arm 65 secured to one end thereof, preferably the left hand end, so that a depression of this finger-piece or arm 65 will rock the shaft 58, thus disengaging the feed rack 43 from its pinion 29 to permit the carriage to be freely moved in either direction.

In the ordinary Densmore machine the paper carriage as an entirety comprises three distinct members, viz.; a frame carrying the platen, a carriage in which the platen frame is mounted or supported, and a truck or frame that carries the feed rack, and hereinafter these parts will generally be designated respectively as the platen frame, the platen carriage and the feed carriage.

The feed carriage comprises a frame 66 in which the rock shaft 58 that extends substantially from end to end of the frame, is pivoted. The rear portion of the feed carriage 66 is grooved longitudinally at 67 to form a track for coöperation with horizontal bearing rollers 68 carried by the rear guide rail 69. The guide rail 69 is secured to the top plate 2 of the machine by angular brackets 70, one of which is shown in detail in Fig. 9 and one end of each of the brackets 70 is secured to the top plate 2 of the machine by headed screws 71 which pass through slots 72 in the bracket and enter tapped holes in the top plate. This arrangement provides means for adjusting the back guide rail 69 in a horizontal direction in order that the guide rail as a whole and the bearing rollers carried thereby, may be adjusted to properly coöperate with the track 67 in the feed carriage.

The upper end of each bracket 70 is formed with a slot 73 through which a headed screw 74 passes and enters a threaded hole in the back guide rail 69 so as to secure said rail to the upper end of each bracket.

The vertical elongated slot 73 in each bracket permits a vertical adjustment of the back guide rail 69 so that the rail not only has a horizontal but a vertical adjustment as well, in order to properly position it and its bearing rollers with relation to the track 67 in the feed carriage. Each of rollers 68 may be individually adjusted axially by the screw threaded adjustable bearing plugs 68<sup>a</sup> see Figs. 4 and 5, which are cup-like at their inner ends and contain anti-friction balls 68<sup>a</sup> against which the coned hub or axle of each roller bears.

Projecting forwardly from the feed carriage frame 66 are eyes 75 (Figs. 1 and 2) that surround a tubular bearing sleeve 76, and which may be secured thereto by screws 77. The sleeve 76 may be of any desired length but we prefer to extend it substantially throughout the length of the carriage for purposes which will hereinafter more clearly appear. This tubular bearing sleeve 76 surrounds an adjustable traverse rod 78 which is supported upon arms or standards 79 projecting up from the top plate and the rod is provided with two parallel longitudinal grooves 80 which receive two sets of anti-friction rollers or balls 81, 82.

From an examination of Fig. 1 of the drawings, it will be observed that the series of balls 81 are arranged in a groove 80 on the top of the rod 78, whereas the series of balls 82 are arranged in a groove 80 on the rear side of the rod; and that the sleeve 76 bears against both series of balls. In order to prevent the feed carriage from lifting, we provide the sleeve 76 with pins 83 which normally are out of contact with the under side of traverse rod. When, however, a slight upward movement is given to the carriage which would tend to displace it, the pins 83 on the sleeve are brought into contact with the traverse rod and prevent such displacement. In order that the loose and freely movable anti-friction balls 81 and 82 may not escape from the tubular sleeve, each end thereof is provided with a segmental flange 84.

Surrounding the sleeve 76 are fixed roller bearing collars 85 (see Figs. 2 and 8) that are provided with ball bearing raceways 86 in which anti-friction rollers or balls 87 travel. The rollers 87 in each bearing coöperate with a beveled end 88 of a revoluble sleeve 89. The sleeve 89 has an internal diameter which is larger than the external diameter of the tubular sleeve 76 and surrounds and is adapted to revolve around the sleeve on the ball bearings and without touching the same. The collars 85 may be maintained in their adjusted position upon the bearing sleeve 76 by set screws 90. The beveling or tapering of each end of the sleeve 89 not only provides thrust bearings for limiting the endwise movement of the



sleeve with relation to its bearings but it likewise forms with the balls a bearing which takes the direct strain or pressure applied to the bearing sleeve 89. This sleeve is adapted to support an arm 91 connected to the platen carriage and thus provide a ball bearing support for the transverse movement of the platen carriage when it is shifted for upper and lower case printing, as will hereinafter more clearly appear.

The ends of the tubular sleeve 76 are cut away on the underside for a considerable of the length of the sleeve as is indicated in Fig. 11 of the drawings. The purpose of cutting away the tubular sleeve in the manner described is to permit the sleeve to pass beyond the supports 79 for the traverse rod in the movement of the carriage from end to end of the machine. While the tubular sleeve may be shortened in order to permit this movement, we prefer to employ a long sleeve and cut away the lower portion of the sleeve in order to provide an elongated bearing surface for the anti-friction rollers 81 82 throughout a considerable length of the carriage, so that there will be no liability of the carriage wobbling or rocking when at or near either extreme of its travel.

Referring particularly to Fig. 11 of the drawings, it will be seen that the cutaway portion of the sleeve 76 terminates at 92 so that substantially the distance between the point 92 and the corresponding end of the sleeve may extend beyond the support 79 at either end of the machine.

In order that the traverse rod 78 may be vertically adjusted to maintain an exact parallelism between said rod and the front and rear guide rods and so that no binding action will take place in the movement of the carriage, and the carriage will run true, we have provided adjusting means which are illustrated in Fig. 7 of the drawings. Said means comprise an adjusting screw 93 which is provided with a hollow head that is internally screw-threaded and a depending screw stem 94 that is adapted to screw into a threaded opening in the support 79. The upper end of the hollow head of this screw is seated within an aperture in the traverse rod 78 and bears against a shoulder 95 formed therein. Thus it will be seen that an elevation or lowering of the adjusting screw (and which may be done with a screw driver, the upper end of the hollow head being nicked for such a tool) in the support 79 will cause the rod or one end of it to be elevated or lowered to a corresponding extent.

In order to maintain the rod fixed upon the adjusting screw, we have provided a securing screw 96, the threaded stem of which coöperates with the internal screw threads in the hollow head of the adjusting screw and the head of the screw 96 bears against a shoulder 97 in the traverse rod so as to main-

tain the rod clamped upon the adjusting screw. An inclosing cap 98 may be provided that partly surrounds the rod and covers the opening in the traverse rod through which the securing screw is introduced and this cap 98 may be secured in place by a screw 99, which passes through the cap and is screwed into the end of the rod. In order to prevent an accidental displacement of the adjusting screw, we may, in addition to the securing screw 96, provide a binding screw 100 which is adapted to screw into a lateral screw-threaded opening in the support 79 and to bear at its inner end upon the adjusting screw, thus locking the same in the adjusted position. It will be understood that the adjusting means described is employed upon each end of the traverse rod so that an independent adjustment of each end thereof may be effected. It will be seen that the employment of a cap prevents the admission of dust to the opening through which the adjusting screw is introduced.

The feed carriage 66 is provided with means for shifting the platen longitudinally with relation to said feed carriage for purposes which will hereinafter appear. Thus, from an inspection of Fig. 2 of the drawings, it will be seen that a spindle 101 is seated to revolve in a bearing 102 that projects from the feed carriage and this spindle is provided with a knurled head 103 at one end thereof and the opposite end is screw-threaded throughout beyond the bearing, as indicated at 104. This screw-threaded portion 104 of the spindle coöperates with an internally screw-threaded lug or nut 105 on an adjustable piece or plate 106.

A lock nut 107 may be employed to secure the adjusting piece in the position to which it is adjusted by the spindle 101. The adjusting piece 106 consists of an elongated bar having slots or openings 108 and in these openings are arranged shanks of the headed-vertical screws 109 which are secured in tapped holes in arms 77<sup>a</sup> that project forwardly from the frame 66 and terminate in the eyes 77. Extending forwardly from the adjusting piece 106 is an eye 110 that is internally screw-threaded for the reception of an externally threaded nut or sleeve 111, which is preferably provided at its left-hand end with a square or octagonal head so that the sleeve may be turned or manipulated by a thin bifurcated wrench; a fork or yoke 112 projects rearwardly from the platen frame and bears against the outer side of said nut.

A set screw 113 passes through the eye 110 and bears upon the adjusting nut 111 to maintain it against accidental turning by the contacting yoke 112. It will be understood that the nut 111 surrounds the tubular sleeve 76 and forms an additional connection between it and the feed carriage 66.



through the intermediate adjusting piece 106. The adjusting piece 106 has a forwardly projecting arm 114 that extends to the tubular sleeve 76 and bears against one face 115\* of a fork or yoke 115 that projects rearwardly from the platen carriage and corresponds to the fork or yoke 112 previously described.

From an examination of Fig. 2 of the drawings, it will be seen that the arm 114 and the nut 111 bear against the inner sides of their associated forks 115 and 112. The nut 111 will take up any lost motion due to wear between the platen carriage and the feed carriage and which would result in an improper lateral alinement or spacing of the writing. In the present structure, if a slight independent longitudinal movement or lost motion exists between the platen carriage and the feed carriage, an adjustment of the nut 111 to force it toward the fork 112, will take up such lost motion and the trouble will be obviated.

The purpose of the adjusting spindle 101 and its cooperating parts is to provide for a slight longitudinal movement of the platen, so that corrections may be neatly made. It is sometimes necessary in making corrections, to crowd a given number of letters within a space which previously contained fewer letters in order to complete a word and this it is not easy to do with the ordinary letter spacing mechanism; but with the aid of the mechanism which has just been described and by turning the spindle 101 the platen can be shifted a fraction of a letter space distance and the word completed in this manner. Assuming that five letters are to be written in the space formerly occupied by four, the carriage will be moved to the correct position to start the word. The spindle 103 may then be turned to adjust or feed the platen endwise so that the next impression will be brought closer to the last letter written than would be the case if the feed was produced by the regular letter spacing mechanism. This may give sufficient room for the remaining letters, in which event the platen may be fed by the ordinary letter space feeding mechanism. It may, however, be necessary to feed the platen by the screw-spindle 103 several times partial letter space distances to get all of the letters within the prescribed space on the paper; and in some instances the letters will overlap.

When the knob of the spindle is turned in the direction of the arrow at the knob in Figs. 1 and 2, the platen carriage and platen will be fed by the screw 104 and nut 105 toward the left and when the knob is turned the other way the platen carriage and platen will be fed toward the right. When the spindle 101 is turned to the right, the adjusting piece 106 will be moved in the direc-

tion of the arrow in Fig. 2 of the drawings, thus moving the entire platen carriage to the right, while the feed carriage remains relatively fixed. This movement of the platen carriage as a whole is produced by the arm 114 forcing the fork 115 to the right and with it the entire platen carriage. When the spindle is turned in an opposite direction, the nut 111 will be carried with the adjusting piece 106 to the left or in a direction opposite to that indicated by the arrow in Fig. 2 and the adjusting nut contacting with the fork 112 will produce a corresponding movement of the platen carriage.

The platen carriage referred to comprises a four-sided frame made up of end plates 116, a rear bar 117, to which the forks 112, 115, are connected, and front connecting bars 118, 119. The end plates 116 may be provided with slotted bearings 120, for the reception of a shaft 121 of the platen 122 and may likewise be slotted to provide a bearing surface for anti-friction rollers 124 that are carried by the platen frame 125 in substantially the same manner as in the well known Densmore machine. The connecting bar 118 which unites the end plates is provided with a carriage scale 126 that cooperates with a fixed pointer 127 secured to the shift rod or rail 120.

The bar 119, in addition to forming a connecting bar between the ends plates, may be grooved, as indicated at 128, to form a trackway for anti-friction rollers 129 that are carried by the shift rod 130. These bearing rollers 129 are represented in detail in Figs. 3 and 4 of the drawings, from which it will be seen that adjustable bearings 131 are formed of externally screw-threaded plugs which are adapted to take in corresponding screw-threaded openings in the shift rod and that each of these bearings is provided with a circular raceway for the reception of anti-friction balls 132 which are adapted to support the coned bearings 133 of the bearing rollers 129. The bearings 131 are each provided with a slit 134 for the accommodation of a screw-driver, by means of which the bearings can be readily turned to adjust the rollers 129 individually with reference to the trackway 128 in the first instance and when wear takes place subsequently, and so that the carriage rail 119 shall at all times be properly supported on and travel truly on said rollers 129. The means for supporting the bearing rollers 68 and 129 are the same.

From an examination of Figs. 2 and 10 of the drawings, it will be seen that shoulders 135 and 136 are carried by the platen frame and bear upon the inner faces of those portions of the end plates in which slotted bearings 120 are formed to maintain the platen and its frame against longitudinal movement with relation to the platen car-



riage, but to permit it to move freely in the bearings 120 thereof. The constant swinging of the platen and its frame in the bearings 120, in order to examine the writing, produces a wear upon the shoulders and a slight endwise shake or lost motion sometimes results therefrom and the letters are in consequence unevenly spaced. In order to overcome this objection I have made one of the shoulders 136 in the form a screw threaded collar which is slotted at 137 so that the collar may be adjusted by a screw driver. This screw-threaded collar is screwed into an internally threaded boss 138 forming a portion of the platen frame. By this means it will be seen that any lost motion which may be produced by wear upon the parts may be readily taken up by adjusting the screw-threaded collar outwardly to compensate for such wear.

The platen frame may be provided with the usual fixed finger piece 139, by means of which the platen can be turned back to inspect the writing.

Reference being had particularly to Figs. 1 and 2 of the drawings, it will be observed that the shift bar 130 is provided with depending arms 216 which are pivoted to the framing of the machine. There are two of these depending arms 216 and a rock shaft 217 extends from side to side of the machine (see Fig. 2) and serves as pivots for the arms 216. The depending arm 216 at one side of the machine, preferably at the left-hand side, is extended to form a depending projection or arm 218 which is operatively connected to suitable temporary shift key levers 226 and 231, bearing finger keys 228 and 232 respectively and to a permanent shift key 235 by means of which the platen may be either temporarily or permanently shifted transversely from one "case" position to the other.

We have applied the term "roller bearing" and "bearing roller" to various parts described herein, though it should be understood that said terms are intended to apply to either anti-friction rollers or balls and to structures embodying either one or the other.

Various changes in detail construction may be made without departing from the gist of our several improvements.

Certain features shown and described are not claimed herein, but constitute the subject-matter of separate divisional applications, filed on the third day of June, 1902, and bearing respectively, Serial Numbers 110,041, 110,042 and 110,043, and on June 6, 1902, Serial No. 110,481, and on July 26, 1902, Serial No. 117,065.

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

1. In a typewriting machine, the combination of a carriage, a rod to which said carriage is connected and upon which it is

adapted to travel, and independent adjustable rigid means for affording a vertical adjustment of both ends of said rod and for positively securing the rod against movement in any direction.

2. In a typewriting machine, the combination of a machine frame and its top plate, a carriage, supports upon said top plate, a rod secured to said supports and to which said carriage is connected and upon which it is adapted to travel, independent means for vertically adjusting both ends of said rod upon its supports, and means for positively and rigidly securing the rod against movement in its adjusted position.

3. In a typewriting machine, the combination of a carriage, supports, a traverse rod secured to said supports and to which said carriage is connected and upon which it is adapted to travel, a vertically disposed adjusting screw which coöperates with said rod at each end thereof and with one of said supports for providing an independent vertical adjustment at each end of the rod, and independent adjustable rigid securing means that coöperate with said rod and with each of said screws to secure the rod against movement in its adjusted position.

4. In a typewriting machine, the combination of a machine frame and its top plate, a carriage, supports upon said top plate, a traverse rod secured to the supports and to which said carriage is connected and upon which it is adapted to travel, an adjusting screw which passes into the rod at each end thereof and into one of said supports for providing an independent adjustment at each end of the rod, and a screw which engages with each of said adjusting screws and with the rod to secure the rod to the adjusting screws.

5. In a typewriting machine, the combination of a machine frame and its top plate, a carriage, supports upon said top plate, a traverse rod secured to the supports and to which said carriage is connected and upon which it is adapted to travel, an externally and internally threaded adjusting screw which passes into said rod at each end and bears against an internal shoulder thereof, for providing an independent adjustment at each end of the rod, and a screw which coöperates with the internal threaded portion of each of said adjusting screws to secure the rod thereto.

6. In a typewriting machine, the combination of a machine frame and its top plate, a carriage, supports upon said top plate, a traverse rod secured to said supports and to which said carriage is connected and upon which it is adapted to travel, internal shoulders at each end of the rod, an externally and internally threaded adjusting screw which passes into said rod at each end and bears against an internal shoulder thereof, for pro-



viding an independent adjustment at each end of the rod, and a screw which coöperates with the internally threaded portion of each of said adjusting screws and bears against an internal shoulder of the rod to secure the rod to the adjusting screws.

7. In a typewriting machine, the combination of a machine frame and its top plate, a carriage, supports upon said top plate, a traverse rod secured to said supports and to which said carriage is connected and upon which it is adapted to travel, an adjusting screw which passes into said rod at each end thereof and into one of said supports, for providing an independent adjustment at each end of the rod, and a cap at each end of said rod and which partly surrounds the same and closes the openings through which the screws pass.

8. In a typewriting machine, the combination of a machine frame and its top plate, a carriage, supports upon said top plate, a traverse rod secured to said supports and to which said carriage is connected and upon which it is adapted to travel, internal shoulders at each end of the rod, an externally and internally threaded adjusting screw which passes into said rod at each end and bears against an internal shoulder thereof for providing an independent adjustment at each end of the rod, a screw which coöperates with the internal threaded portion of each of said adjusting screws and bears against an internal shoulder of the rod to secure the rod to the adjusting screws, and a cap at each end of said rod to close the openings through which the screws are introduced.

9. In a typewriting machine, the combination of a carriage, a roller bearing guide rail coöperating therewith, and means for adjusting said rail in two directions at substantially right angles to each other.

10. In a typewriting machine, the combination of a carriage, a roller bearing guide rail coöperating therewith, and independent means for adjusting each end of said rail in two directions at substantially right angles to each other.

11. In a typewriting machine, the combination of a carriage, a roller bearing guide rail coöperating therewith, means for affording an adjustment of said rail in two directions at substantially right angles to each other, and independent means for adjusting individually the rollers in said rail.

12. In a typewriting machine, the combination of a carriage, a roller bearing guide rail coöperating therewith, independent means for adjusting each end of said rail in two directions at substantially right angles to each other, ball bearings for said rollers, and means for adjusting the rollers on said rail.

13. In a typewriting machine, the combination of a carriage, a roller bearing guide

rail coöperating therewith, means for adjusting said rail in two directions at substantially right angles to each other, ball bearings for said rollers, and individual means for adjusting the bearings of each roller.

14. In a typewriting machine, the combination of a carriage, a roller bearing guide rail coöperating therewith, anti-friction balls for said rollers, bearings for said balls, individual means for adjusting the bearings for the balls of each roller, and individual means for adjusting each end of the rail as a whole in two directions at substantially right angles to each other, so that the opposite ends of said rail may be individually adjusted.

15. In a typewriting machine, the combination of a carriage, a shift rail at the front of the machine, rollers which are carried by said shift rail and coöperate with a rail on the carriage, means for affording an individual adjustment of said rollers, a guide rail at the rear of the carriage, rollers carried by said guide rail, means for effecting a bodily adjustment of said rail in two directions at substantially right angles to each other, and individual means for effecting an individual adjustment of the rollers on said guide rail.

16. In a typewriting machine, the combination of a carriage, a guide rail, brackets connecting said guide rail to the frame of the machine and having horizontal and vertical slotted portions for connection to the machine frame and guide rail, and screws that pass through said slotted portions and secure the brackets to the frame and secure the rail to the brackets, whereby the guide rail may receive a horizontal and vertical adjustment and may be secured in its adjusted position.

17. In a typewriting machine, the combination of a carriage, a guide rail, a series of guide rollers, adjustable screw plugs received within threaded openings in the guide rail, bearing rollers interposed between said screw plugs and guide rollers, to afford an individual adjustment of the guide rollers on said rail, brackets connecting said guide rail to the frame of the machine and having horizontal and vertical slotted portions for connection to the machine frame and guide rail, and screws that pass through said slotted portions and secure the brackets to the frame and secure the rail to the brackets, whereby the guide rail may receive a horizontal and vertical adjustment and may be secured in its adjusted position.

18. In a typewriting machine, the combination of a truck, a traverse rod, a sleeve positively connected to the truck and surrounding said traverse rod, anti-friction rollers between said rod and sleeve, a bear-



ing roller surrounding the sleeve, a platen carriage that swings independently of the truck, an arm that extends rearwardly from said carriage and bears on said bearing roller so as to afford a direct fore and aft rolling movement of the arm on said bearing roller, and a shift rail with which the platen carriage coöperates to effect the fore and aft movement thereof.

19. In a typewriting machine, the combination of a truck, a traverse rod, a sleeve positively connected to the truck and surrounding said traverse rod, anti-friction rollers between said rod and sleeve, a bearing roller surrounding the sleeve, anti-friction rollers interposed between the sleeve and bearing roller, adjustable bearings for said last-mentioned anti-friction rollers, a platen carriage, an arm that extends from said carriage and bears on bearing roller so as to afford a direct fore and aft rolling movement of the arm on said bearing roller, and a shift rail with which the platen carriage coöperates to effect the fore and aft movement thereof.

20. In a typewriting machine, the combination of a carriage, a traverse rod, a sleeve which surrounds said rod and is connected to the carriage and extends substantially throughout the length of the carriage, anti-friction rollers interposed between the sleeve and rod, and a stop interposed between the sleeve and rod to prevent a displacement of the sleeve and carriage.

21. In a typewriting machine, the combination of a carriage, a traverse rod, a sleeve which surrounds said rod and is operatively connected to the carriage and extends substantially throughout the length of the carriage, anti-friction rollers interposed between the sleeve and rod, a platen carriage, an arm connected thereto, and a roller bearing sleeve carried by and rotatable upon the feed carriage sleeve and with which the said arm of the platen carriage is adapted to coöperate when the platen carriage is shifted transversely for upper and lower case printing.

22. In a typewriting machine, the combination of a feed carriage, a platen carriage coöperating therewith and movable transversely thereto to change the case position of the platen, an arm connected to said platen carriage, and a roller bearing supported sleeve which is operatively connected to travel with the feed carriage and coöperates with the said arm on the platen carriage to support the platen carriage in its transverse movement.

23. In a typewriting machine, the combination of a roller bearing supported feed carriage, a longitudinally and transversely movable platen carriage which is operatively connected to said feed carriage to move therewith in a letter feed direction and

to receive a transverse case shift movement independently thereof, roller bearings for supporting said platen carriage in its longitudinal and transverse movements, and means for adjusting all of said roller bearings.

24. In a typewriting machine, the combination of a roller bearing supported feed carriage, a longitudinally and transversely movable platen carriage which is operatively connected to said feed carriage, roller bearings for supporting said platen carriage in its transverse movement, a shift rail which coöperates with platen carriage to shift it transversely, bearing rollers interposed between the platen carriage and shift rail and upon which the said platen carriage bears in its longitudinal movement and means for adjusting all of said bearing rollers.

25. In a typewriting machine, the combination of a feed carriage, a platen carriage, and means for adjusting one of said carriages with relation to the other and for maintaining such adjustment indefinitely, said adjusting means including a finger piece accessible to the operator for operating said adjusting means to effect a fractional letter spacing.

26. In a typewriting machine, the combination of a feed carriage, a platen carriage operatively connected thereto, and means for adjusting one of said carriages endwise with relation to the other for changing the printing position of the platen, said means including a single finger piece operative to produce such adjustment without affecting the seating of one carriage on the other.

27. In a typewriting machine, the combination of a feed carriage, a platen carriage operatively connected thereto, means for taking up any lost motion between the carriages, and independent means for effecting a relative endwise adjustment between said carriages.

28. In a typewriting machine, the combination of a feed carriage, a feed element carried thereby, feeding mechanism which coöperates with said feed element, a swinging platen carriage operatively connected to the feed carriage, means for taking up any lost motion between the carriages, and hand actuated means independent of the take-up means for effecting a relative adjustment between the platen carriage and feed carriage.

29. In a typewriting machine, the combination of a feed carriage, a platen carriage operatively connected thereto, means for taking up any endwise lost motion between the carriages, and means for taking up and preventing any endwise lost motion of the platen in its carriage.

30. In a typewriting machine, the combination of a platen carriage, a platen which is movable transversely of its axis in the platen carriage, and means for taking up



any endwise lost motion between the platen and the platen carriage.

31. In a typewriting machine, the combination of a platen, a platen carriage having 5 guide-ways thereon, a platen shaft which slides transversely of its axis in said guide-ways, abutments for preventing the platen from moving endwise with relation to the platen carriage, and means for adjusting one 10 of said abutments to take up any endwise lost motion between the platen and the platen carriage.

32. In a typewriting machine, the combination of a platen, a platen carriage having 15 guide ways thereon, a platen frame which slides in said guide ways to expose the writing and which is likewise removable therefrom, and abutments for preventing the platen frame from moving endwise with relation to the platen carriage when the platen 20 is in the operative position or when the platen frame is being moved to expose the writing, one of said abutments being formed of an adjustable collar for taking up any 25 endwise lost motion between the platen frame and the platen carriage.

33. In a typewriting machine, the combination of a truck having forwardly projecting members, a swinging platen carriage 30 having rearwardly projecting members, an adjusting device interposed between said members and adapted to take up the lost motion between them, and separate means for effecting fractional letter-space adjustment 35 between the truck and platen carriage.

34. In a typewriting machine, the combination of a truck having forwardly projecting members, a platen carriage having rearwardly projecting members, an adjustable 40 collar carried by one of said members and adapted to contact with a member on the other part to take up the lost motion between the truck and platen carriage, and separate hand actuated means for effecting 45 a fractional letter space adjustment between the truck and platen carriage.

35. In a typewriting machine, the combination of a truck, a platen carriage having rearwardly projecting forks, means on the 50 truck which engage the forks and cause the platen carriage to travel with the truck, and an adjustable nut for taking up the lost motion between the forks and said engaging means on the truck.

36. In a typewriting machine, the combination of a truck, a platen carriage, an eye 110 and an arm 114 on the truck, forks 112 and 115 carried by the platen carriage, and an adjustable nut carried by the eye 110 60 and cooperating with the fork 112 to take

up the lost motion between the platen carriage and truck.

37. In a typewriting machine, the combination of a platen carriage, a platen frame that is adapted to swing and to slide therein, and an adjustable collar that is adapted 65 to take up the wear between the platen frame and the carriage.

38. In a typewriting machine, the combination of a platen carriage having bearings 70 therein, a platen frame seated in the bearings in said carriage and adapted to slide therein, and a screw-threaded collar carried by the platen frame and adapted to contact with one of said bearings and take 75 up the wear between the platen frame and carriage.

39. In a typewriting machine, the combination of a truck, a platen that is adapted to receive an endwise adjustment relatively 80 to said truck, a screw-threaded connection between said platen and truck for effecting such adjustment and for maintaining a fixed endwise relation between the said platen carriage and truck, and a finger piece 85 connected to said screw-threaded connection and operative to effect such adjustment.

40. In a typewriting machine, the combination of a truck, a platen carriage, a slide that forms an operative-connection between 90 said truck and carriage, and means for adjusting said slide.

41. In a typewriting machine, the combination of a truck, a platen carriage, a slide that forms an operative connection between 95 said truck and carriage, and a screw-threaded spindle that is connected to said truck and slide and is effective to produce a relative movement between the slide and truck so as to move the platen carriage relatively to the truck. 100

42. In a typewriting machine, the combination of a truck, a platen carriage, a slide that is operatively connected to the platen carriage to effect an endwise movement 105 thereof, a hand-operated screw-threaded spindle, a bearing on the truck in which said spindle is adapted to turn but which prevents a longitudinal displacement of said spindle relatively to the truck, and a threaded bearing in the slide and in which the 110 threads on the spindle engage.

Signed at the borough of Manhattan, in the city of New York, in the county of New York, and State of New York.

WALTER J. BARRON.  
HENRY W. MERRITT.

Witnesses:

K. V. DONOVAN,  
E. M. WELLS.