No. 776,259. PATENTED NOV. 29, 1904.

L. R. ROBERTS.

TYPE WRITING MACHINE.

APPLICATION FILED MAY 6, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

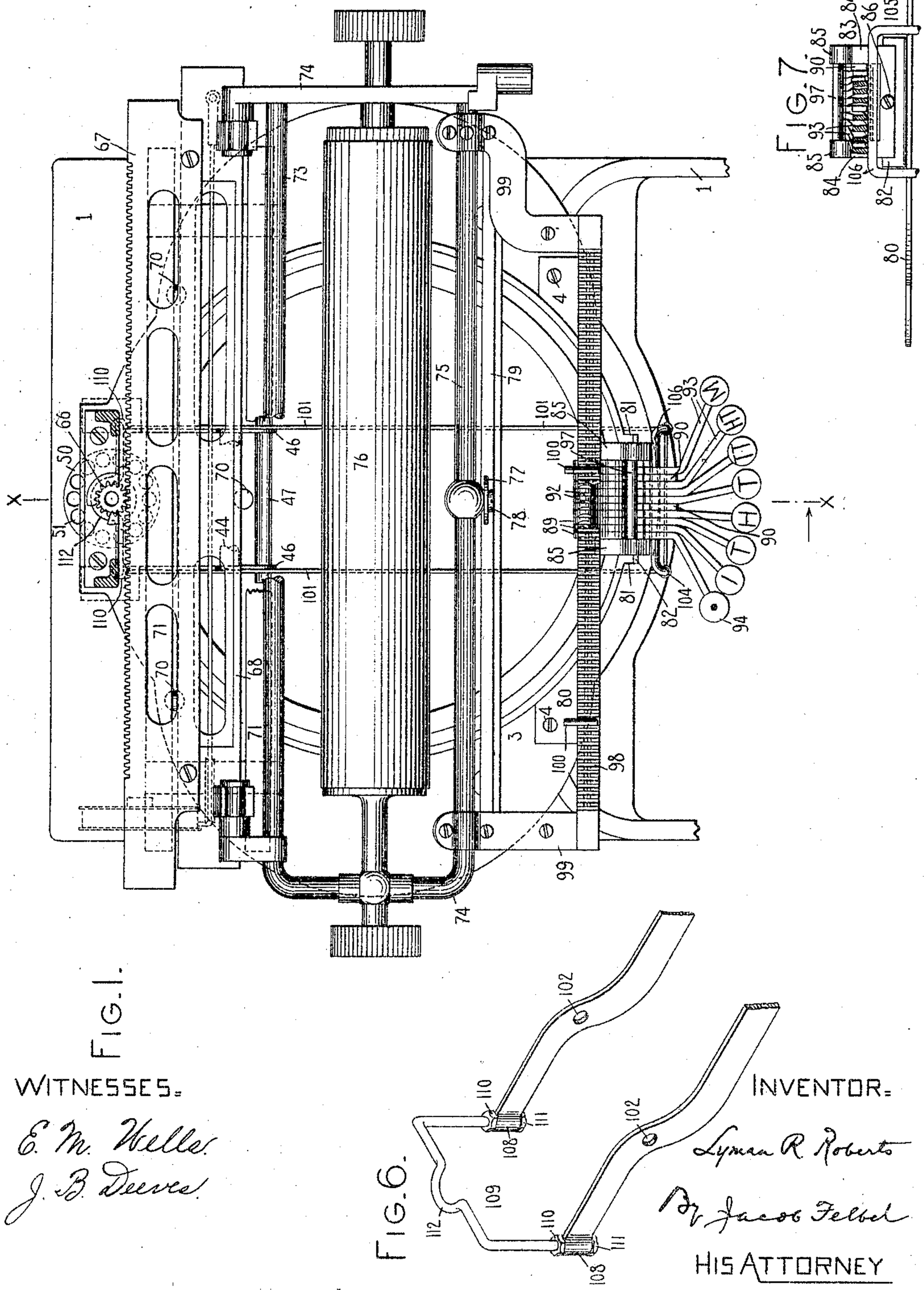

FIG. 1.

FIG. 7.

FIG. 6.

WITNESSES.

E. M. Keller.

J. B. Deeves.

INVENTOR.

Lyman R. Roberts

By Jacob Felbel

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NO MODEL. 2 SHEETS—SHEET 2.

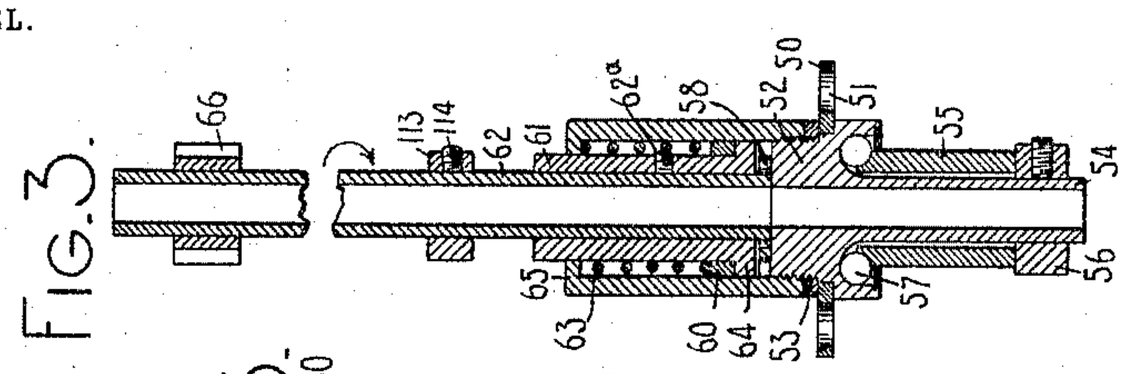

FIG. 3.

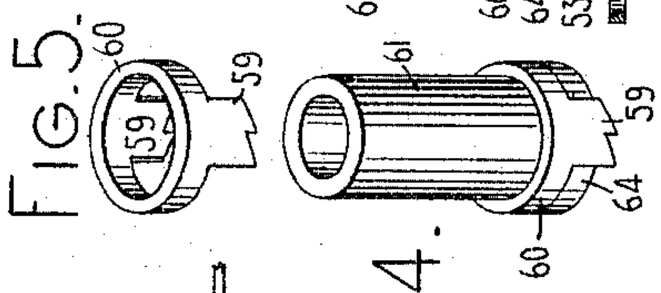

FIG. 5.

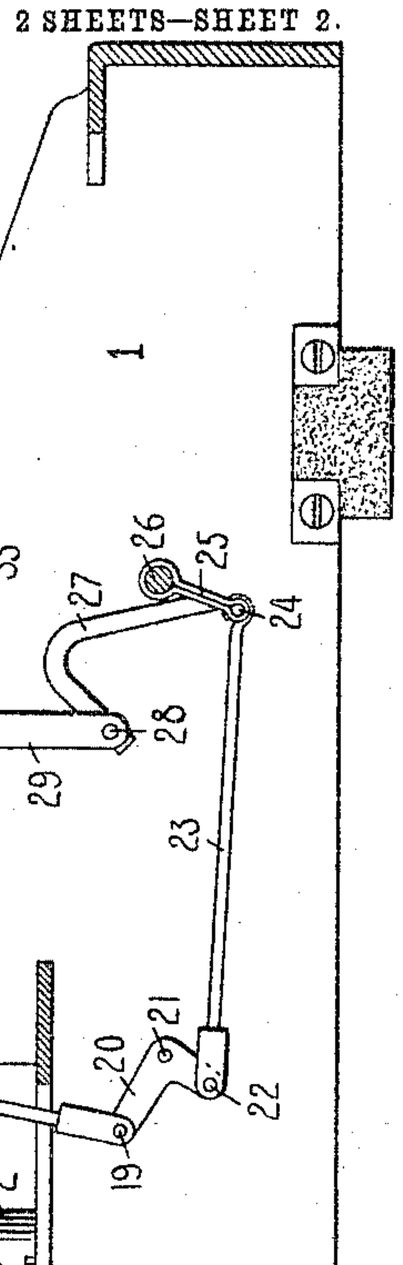

FIG. 4.

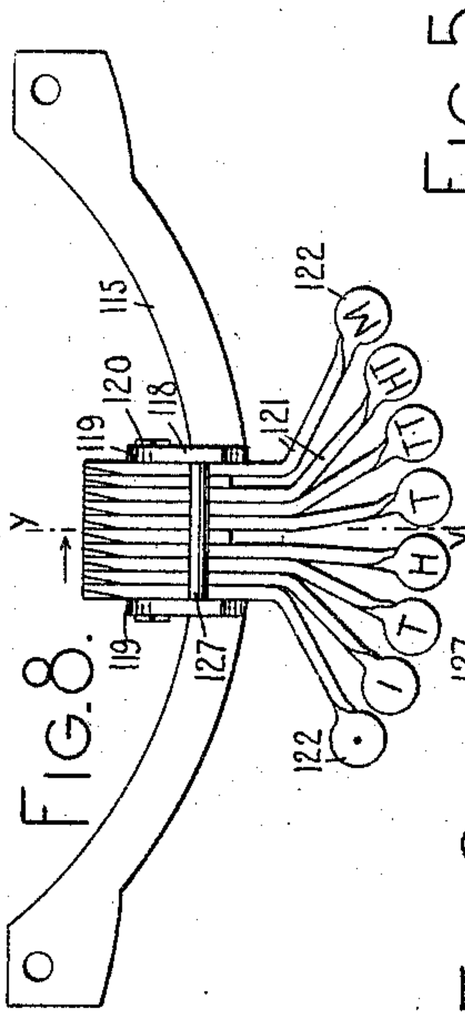

FIG. 8.

FIG. 9.

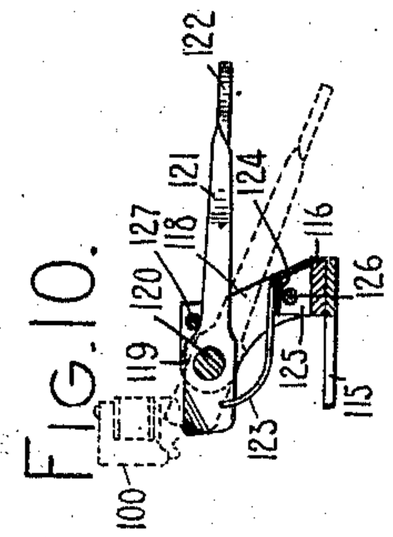

FIG. 10.

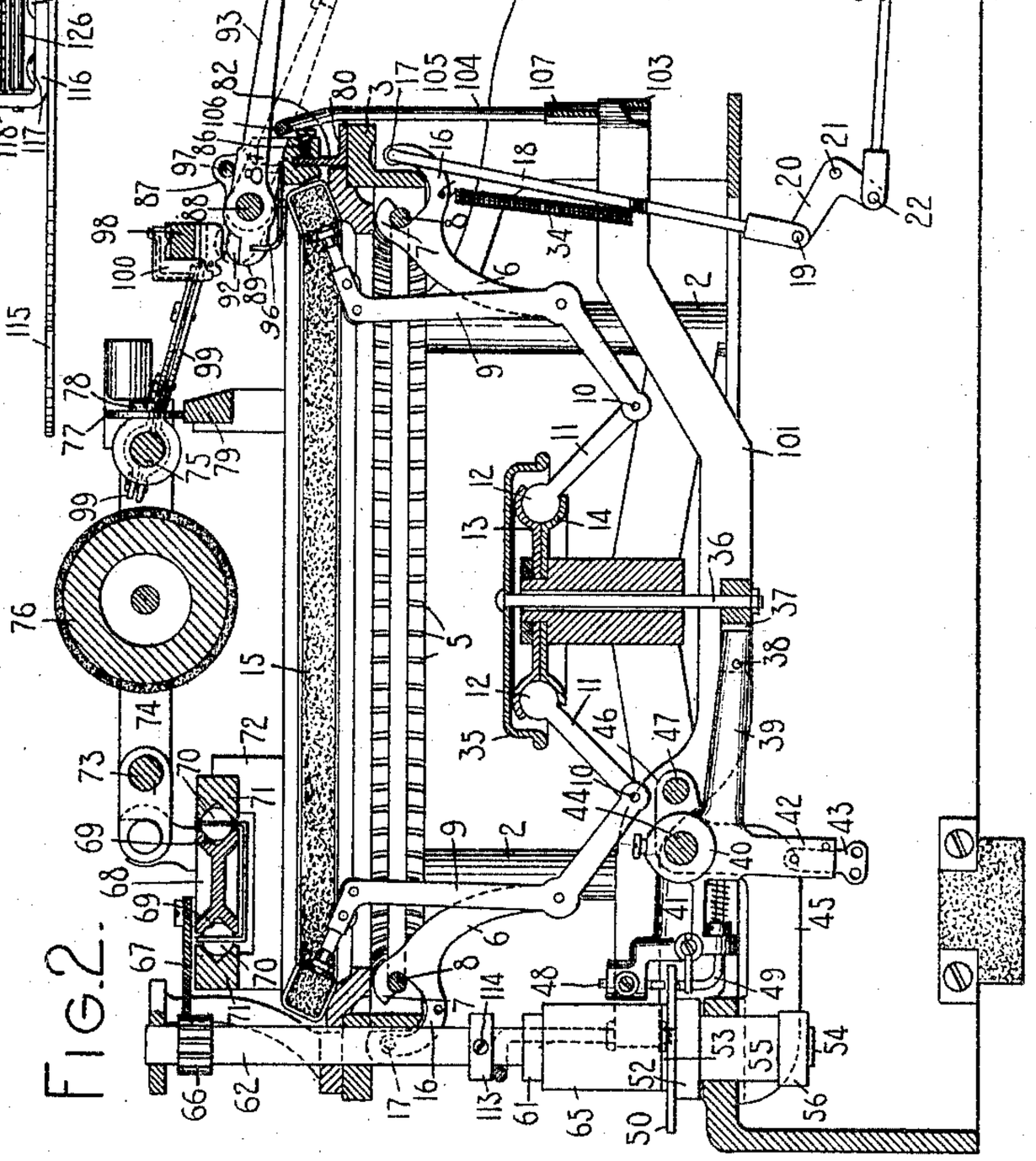

FIG. 2.

WITNESSES.

E. M. Wells.

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No. 776,259. Patented November 29, 1904.

UNITED STATES PATENT OFFICE.

LYMAN R. ROBERTS, OF DETROIT, MICHIGAN, ASSIGNOR TO YOST WRITING MACHINE COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 776,259, dated November 29, 1904.

Application filed May 6, 1904. Serial No. 206,648. (No model.)

To all whom it may concern:

Be it known that I, LYMAN R. ROBERTS, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to tabulating mechanisms for writing-machines, and more particularly to that class of tabulators in which at the operation of a denominational key a denominational stop corresponding thereto is moved into position to coact with another cooperating stop and the carriage is automatically released and permitted to be drawn to the left by the usual carriage-spring until arrested by the said denominational stop at a point where the writing of a number corresponding in denomination to the operated key will be begun.

One object of this invention is to simplify and otherwise improve a tabulating mechanism of this class. Another object is to so construct such a mechanism that it may be attached to existing forms of type-writing machines without altering any of the parts of the latter.

My invention consists in certain features of construction and combinations of parts, all as will be fully hereinafter set forth, and particularly pointed out in the appended claims.

In the accompanying drawings the invention is shown applied to a type-writing machine having the general characteristics of that commercially known as the "No. 10 Yost typewriter."

Figure 1 is a plan view of the machine with the keyboard portion broken away. Fig. 2 is a vertical front-to-rear sectional view taken on the line *x x* of Fig. 1 and looking in the direction of the arrow at said line and with such portions omitted as are not material. Fig. 3 is an enlarged detail sectional view of the escapement-wheel and its bearing and of the clutch mechanism. Figs. 4 and 5 are details of the clutch mechanism. Fig. 6 is a perspective view of the rear portion of the carriage-releasing means employed in connection with the denominational stops. Fig. 7 is a front elevation of the denominational-stop mechanism shown detached from the machine. Fig. 8 is a plan of a modified form of denominational-stop mechanism. Fig. 9 is a front elevation of Fig. 8. Fig. 10 is a sectional view taken on the plane represented by the dotted line *y y* of Fig. 8 and looking in the direction of the arrow at said line.

Like numerals designate like parts throughout the several views, wherein—

1 indicates the frame of the machine, sustaining corner-posts 2, upon which a type-ring 3 is secured by screws 4. The type-ring is provided with radial slots 5 for the reception of drivers 6, each driver having a hook-like projection 7, bearing upon a fulcrum-ring 8, arranged in a groove in the type-ring 3. The lower end of each driver is pivoted to a type-bar 9, which latter is pivotally connected at 10 to the end of a guide-link 11, said guide-link having at its other end a disk-like portion 12, which is held in a bearing formed of two circular plates 13 and 14, suitably fastened together and supported centrally of the type-bar system. The face of the type on the end of each type-bar 8 normally rests against an inking-pad 15, which is supported on the type-ring 3. The driver 4 of each type-bar is provided with an extension 16, which is connected at 17 with the upper end of a connecting-rod 18, the lower end of which is pivotally connected at 19 to the upper arm of a bell-crank 20, pivoted at 21 to a stationary part of the machine. Pivoted at 22 to the lower arm of the bell-crank 20 is the rear end of a draw-link 23, the forward end of which is pivoted at 24 to an actuating-blade 25, pivoted to a stationary pivot 26. Integral with blade 25 is the curved arm 27, pivotally connected to which at 28 is the key-stem 29, bearing key-cap 30 and connected at 31 to the upper guide-arm 32, the latter being pivoted to a stationary pivot 33. A contractile spring 34, having one end attached to the driver 4 and the other to connecting-rod 18, assists in restoring the type-actuating mechanism to normal position after the type has been actuated to print in the well-known manner.

Above the circular bearing-plates 12 and 13 a circular universal bar 35 is so arranged that the guide-link 10 is adapted to contact there-

with during the movement of the type toward the printing-point. This contact of the guide-link with the universal bar raises the latter at one side, and with it a headed rod 36, passing loosely through a central opening therein. The lower end of the rod 36 is adjustably connected with a block 37, which is pivoted at 38 to an arm 39, which is the forward arm of the dog-rocker, the latter comprising in addition to the forwardly-extending arm 39 a hub 40, from which arm 39 extends, and also rear arm 41 and downward arm 42, both likewise extending from hub 40. The downwardly-extending arm 42 carries the link 43, with which the draw-link of the spacing-bar (not shown) connects. The hub 40 of the dog-rocker has a rock-shaft 44 rigidly connected thereto, said rock-shaft being seated in side bearing-brackets 45, secured to the frame 1. Forward of rock-shaft 44 the brackets 45 terminate in ears 46, which support the stiffening-rod 47.

The rearwardly-projecting arm 41 of the dog-rocker is furnished with a fixed dog 48 and loose dog 49, said dogs being adapted to coöperate with the horizontally-disposed escapement-wheel 50, which is a disk having near its periphery a circular series of round escapement-holes 51, with which the dogs coact. The escapement-wheel, as is best seen in Fig. 3, is supported on a carrier 52, the cylindrical outer surface whereof may be threaded for the reception of a nut 53, which may be screwed down on the escapement-wheel, maintaining the latter in place vertically, it being compelled to rotate with the carrier by stud-and-slot connection. (Not shown.) The carrier 52 has a depending hollow stem 54, which extends through a sleeve 55, fixed within an opening in the frame 1, and it is prevented from being displaced by a collar 56 on the hollow stem 54. The upper surface of the sleeve 55 and the opposing face of the carrier 52 are formed into ball-races for the reception of the antifriction-balls 57, thus furnishing a ball-bearing for the escapement-wheel. The upper end of the carrier 52 is provided with crown ratchet-teeth 58, which coöperate with several ratchet-teeth 59, projecting downward from a collar 60, Figs. 4 and 5, which collar fits over the tubular member or collar 61. A hollow shaft 62 fits within the collar 61, which is fixed by a set-screw 62^a to the hollow shaft. The collar 60 is normally pressed by a spiral spring 63 against a flange 64 on the collar 61, the flange being cut away to permit of the passage of the teeth 59. The spiral spring 63 is wound around the tubular member 61 and is held in place by the housing 65, which screws on the carrier 52, Fig. 3, and against the top of which the upper end of the spring 63 bears.

The clutch mechanism thus briefly described operatively connects the escapement-wheel 50 with the hollow shaft 62 and enables them both to rotate together in the direction of the arrow in Fig. 3 and permits the shaft 62 to move independently of the wheel when the shaft is rotated in reverse direction.

Fixed near the upper end of the shaft 62 is the pinion 66, which meshes with a feed-rack 67, projecting rearwardly from the carriage 68. The latter is provided with oppositely-grooved ways 69 to receive antifriction-balls 70, which are likewise received in oppositely-grooved tracks or ways 71, supported by brackets 72 on the machine-frame. The carriage pivotally supports a platen-carrier consisting, essentially, of the rear rod 73, side rods 74, and a front rod 75. The platen-carrier supports the platen 76, and its front rod 75 is furnished with a roller 77, secured by a screw 78 and bearing upon the front track 79.

The key-action, carriage-feed, carriage, and machine in general as thus far described correspond generally to the type-writer commercially known as the "No. 10 Yost," and as these features are the same substantially as those set forth and claimed in the pending applications of C. W. Walker, Serial No. 128,470, filed October 23, 1902, and Serial No. 86,821, filed December 21, 1901, it is not deemed necessary to describe them with greater particularity, they forming no part of this invention.

Coming now to the tabulating means, 80 is a plate conforming generally in plan to the forward portion of the type-ring, to which it is fastened by the screws 4, which pass through holes made for their reception near the end of the plate. In the center and at the rear of the plate 80 slits 81 are made, and the portion of the plate 80 between the slits is turned up at right angles, forming a lip 82 for the reception of the denominational-stop holder 83. The denominational-stop holder, as viewed in front elevation, Fig. 7, is substantially U-shaped, having a horizontal portion 84 and side portions 85. Longitudinally of the horizontal portion 84 a notch or cut-away is formed, by which the holder 83 is slipped over the upturned lip 82 and to which it is adjustably secured by a set-screw 86. Projecting rearwardly from the side portions 85 near their tops are ears 87, which afford a support for the denominational-stop rod 88, that serves as a bearing for a set of denominational stops 89, which, as here shown, are eight in number. The distance between the rod-supports 87 is so fixed as to permit the set of denominational stops 89 and two so-called "spacing" or "punctuation" stops 90 to be so arranged upon the bearing-rod 88 that while the stops 89 may revolve freely on the rod they are too closely disposed to permit any side play. Each stop 89 is connected to or formed as a part of a finger-piece and so as to provide, essentially, a lever of the first order. A beveled portion 92 is formed on the stop proper, which projects rearwardly from the stop-rod, and a forwardly-projecting portion 93 is furnished with a key-button 94, the

stops, as may be seen in Fig. 1, being fanned forward of the stop-rod to afford room for the key-buttons. The stops of these latter are supplied with suitable indicating characters, numerals, or letters—such as ".," "1," "T," "H," "T," "TT," "HT," and "M"—to designate the different denominational positions secured with the aid of said keys—such, for instance, as the decimal, units, tens positions, and so on up to millions. Each stop proper has on its under side a cut-away, in which is suitably secured the rear upwardly-extending end of a leaf-spring 96, the other end whereof rests upon the top of the horizontal portion 84 of the stop-holder, Fig. 2. The arrangement of the spring 96 is such that the effect of its tension on its associate stop tends to elevate the forward portion 93 until it contacts with a limiting-rod 97, which passes from side to side above the set of stops and is secured in the side portions 85 of the stop-holder, so that normally the stop is maintained in the position shown in full lines in Fig. 2.

A carriage-stop rack 98 of the usual pattern is adjustably attached to the front rod 75 of the platen-carriage by clamps 99 in such position that column-stops 100, adjustably mounted on the said rack, are in position to coact with any one of the series of denominational stops when it is in operative position. The column-stops are similar to those shown in the patent to Diss, No. 681,846, dated September 3, 1901, with the usual scale corresponding to the carriage-scale at the front face of the carriage-stop rack or bar 98, and therefore it is not thought necessary to describe it further in this connection.

The carriage-releasing means employed in connection with the denomination-stops, consisting of a frame made up of fore and rear bails connected by side bars, will now be described. Two side bars 101 are passed fore and aft of the machine between the connecting-wires 18 and are so shaped that they pass beneath the drivers 6, type-bars 9, and guide-links 11. Near their rear ends the side bars have perforations 102, Fig. 6, which enable them to be pivotally connected with the rod 47, the ends of the latter projecting sufficiently from the ears 46 to afford bearings for side bars 101, Fig. 1. The forward ends of the side bars are furnished with eyes 103 to receive the ends of the side rods 104 of the front bail 105, the top 106 of which passes from side to side beneath the forward portions 93 of the series of denominational stops. The bail 105 is provided with a cross stiffening-brace 107, connecting the arms 104, and the ends of said arms are pushed into the eyes 103 until the bottom of brace 107 contacts with the top of the eyes, Fig. 2, the friction between the ends of the bail-arms 104 and the eyes 103 serving as a means for connecting the front bail 105 thereto.

The rear ends of the side bars 101 are likewise provided with eyes 108 for the reception of the ends of the rear bail 109, which fit loosely therein. The ends of the bail are threaded, and adjusting-nuts 110 and 111 thereon afford means for attaching the bail to the side bars 101 and for conveniently altering its vertical position, Fig. 6. The top of the bail is curved rearwardly to enable it to loosely embrace the hollow shaft 62, and upon the latter and just above the curved portion 112 of the bail a collar 113 is fixedly attached by a set-screw 114. A vertical adjustment of the bail 109 or collar 113 is effective to time the release of the carriage with reference to the interpositioning of a denominational stop in the path of one of the column-stops on the carriage. By making the bail 109 detachable or separable from the side bars 101 means are provided for readily placing the carriage-releasing frame in position in the machine or removing it therefrom.

An adjustment of the bail 109 or the collar 113 is effective to regulate or time the release of the carriage relative to the interpositioning of a denominational stop in the path of a column-stop on the carriage.

The operation of the tabulator will be readily understood. When the finger-button of the desired denominational stop 89 is adequately depressed, the stop assumes the dotted-line position shown in Fig. 2, and its rear end 92 will be in position to coact with the first columnar stop 100 to its right when the carriage is released to be drawn to the left by the usual carriage-spring. The depression of the forward portion 93 of the stop causes its under side to press down the top 106 of the front bail, and this downward movement of the bail actuates the forward portion of the side bars 101 downward about the pivot 47 and raises that portion of the side bars in rear of the pivot, this latter movement raising the rear bail and bringing the curved portion 112 thereof into contact with the collar 113. The upward movement of the collar 113 raises the hollow shaft 62, which carries with it the collar 61 and the collar 60, with ratchet-teeth 59. As soon as these teeth 59 are separated from the crown-ratchet 52 the carriage, thus freed from connection with the escapement, moves to the left under the influence of the usual carriage-spring until the columnar stop 100 contacts with the raised end of the denominational stop, when the carriage is stopped in position to write the desired number, and the denominational key is thereupon released. The operation is repeated for each successive number.

Coming now to Figs. 8, 9, and 10, I show therein a preferred form of denominational-stop holder and stops to be used in connection with the above-described means for releasing the carriage. The base-plate 115 (shown in said figures) is similar in conformation and mode of attachment to the machine

to the one denoted as 80 and previously described; but the upturned lip of the latter is absent. The stop-holder proper, 116, is a U-shaped piece permanently fastened by any suitable means, as by rivets 117, to the base-plate 115. The side portions 118 of the stop-holder have near their tops rearwardly-projecting ears 119, which afford a support for the stop-rod 120. The denominational stops 121 are made of a single piece, the finger-buttons 122 being given a right-angle twist after the stop is stamped or cut out. The series of stops is mounted on the rod 120, as in the previously-described construction, and each stop has attached to it a tension-spring 123, the other end of which rests on a plate 124, horizontally disposed beneath the denominational stops and having its ends 125 bent down at right angles and resting on the stop-holder. The said ends are perforated to afford a passage for a rod 126, the ends of which are fixed in side portions 118, said rod serving as a cross-brace for the holder 116 and to retain the plate 126 in place. The tension of springs 123 serve to keep the denominational stops normally pressed against the limiting-rod 127, which passes from side to side of the holder above the stops and has its ends fixed in the side portions 118.

The operation of the stops 121 is similar to that of stops 91 and need not be further described.

The construction above set forth has few parts, is light in weight, and is readily adjusted to the machine without changing any of the parts of the latter. The tabulator is operated easily with slight expenditure of force, and its operation in no wise interferes with that of the regular keyboard of the machine, while, owing to the position of all the parts on the front of the machine, the column-stops are adjustable with facility, and the course of the work may be readily followed.

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

1. In a tabulating mechanism for type-writing machines, the combination of a carriage, a stop-bar mounted rigidly upon the forward part of and adapted to travel with the carriage, a column stop or stops on said bar, a series of denomination key-levers carrying stops, said key-levers and denomination-stops being mounted at the front portion of the machine above the keyboard and adapted to coact with said column stop or stops, and means for releasing the carriage, said means being operated by an actuation of one of the series of denomination-stops.

2. In a tabulating mechanism for type-writing machines, the combination of a carriage, a stop-bar mounted forwardly on the carriage, a column stop or stops on said bar, a series of denomination-stops mounted at the front portion of the machine, said denomination-stops each consisting of a lever of the first order, having a finger portion forward of the pivot, and a stopping portion rearwardly thereof, said stopping portion being adapted to coact with the column stop or stops, and means for releasing the carriage, said means being actuated by the finger portion on the denomination-stops.

3. In a tabulating mechanism for type-writing machines, the combination of a carriage, a stop-bar mounted forwardly on the carriage, a column stop or stops on said bar, a series of denomination-stops mounted forward of the stop-bar, and means for releasing the carriage, said means consisting of a frame composed of front and rear bails and two side bars.

4. In a tabulating mechanism for type-writing machines, the combination of a carriage, a stop-bar mounted forwardly on the carriage, a column stop or stops on said bar, a series of denomination-stops mounted at the front portion of the machine, and means for releasing the carriage, said means consisting of a frame composed of front and rear bails and two side bars, the bails being separable from the side bars so that the frame may be readily attached to or removed from the machine.

5. In a tabulating mechanism for type-writing machines, the combination of a stop-bar mounted forwardly on the carriage, a column stop or stops on said bar, a series of denomination-stops mounted at the front portion of the machine, and means for releasing the carriage, said means consisting of a frame composed of front and rear bails and two side bars, the front bail being actuated by any denomination-stop and the rear bail releasing the carriage.

6. In a tabulating mechanism for type-writing machines, the combination of a carriage, carriage-feed mechanism, clutch mechanism which connects the carriage-feed mechanism to the carriage, a stop-bar mounted forwardly on the carriage, a column stop or stops on said bar, a series of denomination-stops mounted at the front portion of the machine, and means for releasing the carriage, said means consisting of a frame composed of front and rear bails and two side bars, the front bail being actuated by any denomination-stop and the rear bail releasing the carriage by disconnecting the clutch mechanism which connects the carriage with the carriage-feed mechanism.

7. In a tabulating mechanism for type-writing machines, the combination of a carriage, a stop-bar mounted forwardly on the carriage, a column stop or stops on the bar, a series of denomination-stops mounted at the forward portion of the machine, and means for releasing the carriage, said means consisting of a frame composed of front and rear bails and two side bars, the front bail being actuated by any denomination-stop and the rear bail

releasing the carriage, the said rear bail being vertically adjustable.

8. In a tabulating mechanism for type-writing machines, the combination of the stop-bar mounted forward of the carriage, a column stop or stops on said bar, a series of key-actuated denomination-stops mounted at the front portion of the machine in a holder removably attached to the machine-frame in such wise that the denomination-keys are above and central of the regular keyboard, and a depressionable bail forward of the type-ring and on which the denomination-keys are adapted to act to release the carriage.

9. In a tabulating mechanism for type-writing machines, the combination of a detachable denomination-stop holder composed of a plate attachable to the top of the machine-frame, a U-shaped holder permanently fixed to the plate, the side portions of said holder having ears which support a stop-rod.

10. In a tabulating mechanism for type-writing machines, the combination of a detachable denomination-stop holder and denomination-stops mounted in the holder, said stops each consisting of a single piece of metal having a finger-button at one end and a stopping portion at the other.

11. In a tabulating mechanism for type-writing machines, the combination of a detachable denomination-stop holder composed of a plate attachable to the top of a machine-frame, a U-shaped holder fixed to the plate, the side portions of said holder terminating in ears which support a stop-rod and denomination-stops mounted on the rod, said stops each consisting of a single piece of metal having a finger-button at one end and a stopping portion at the other.

12. In a tabulating mechanism for type-writing machines, the combination of a detachable denomination-stop holder and denomination-stops mounted in the holder, said stops each consisting of a single piece of metal having a finger-button at one end and a stopping portion at the other, and springs for normally maintaining the denomination-stops against a limiting-rod.

13. In a tabulating mechanism for type-writing machines, the combination of a detachable denomination-stop holder composed of a plate attachable to the top of the machine-frame, a U-shaped holder fixed to the plate, the side portions of said holder terminating in ears which support a stop-rod, denomination-stops mounted on said rod, said stops each consisting of a single piece of metal having a finger-button at one end and a stopping portion at the other end, and tension-springs which serve normally to maintain the denomination-stops against a limiting-rod.

14. In a tabulating mechanism for type-writing machines, the combination of a detachable denomination-stop holder and denomination-stops mounted in the holder, said stops being fanned forward of their pivots to afford room for the key-buttons which are formed of the same piece as the denomination-stop bodies and twist on an angle thereto.

15. In a tabulating mechanism for type-writing machines, the combination of a detachable denomination-stop holder composed of a plate attached to the top of the machine-frame, a U-shaped holder permanently fixed to said plate, the side portions of said holder terminating in ears which support a stop-rod, and a series of denomination-stops mounted on said rod, said stops each consisting of a single piece of metal having a finger portion at one end and a stopping portion at the other end, the said series of denomination-stops being fanned forward of the stop-rod to afford room for the key-buttons which are formed of the same piece as the denomination-stop bodies and are twisted at an angle thereto.

Signed at Detroit, in the county of Wayne and State of Michigan, this 30th day of April, A. D. 1904.

LYMAN R. ROBERTS.

Witnesses:

CASSIUS HOLLENBECK,

WILLIAM H. WOOD.