No. 635,942. Patented Oct. 31, 1899.

L. H. PERRY.

TYPE WRITING MACHINE.

(Application filed Aug. 3, 1898.)

(No Model.) 2 Sheets—Sheet 1.

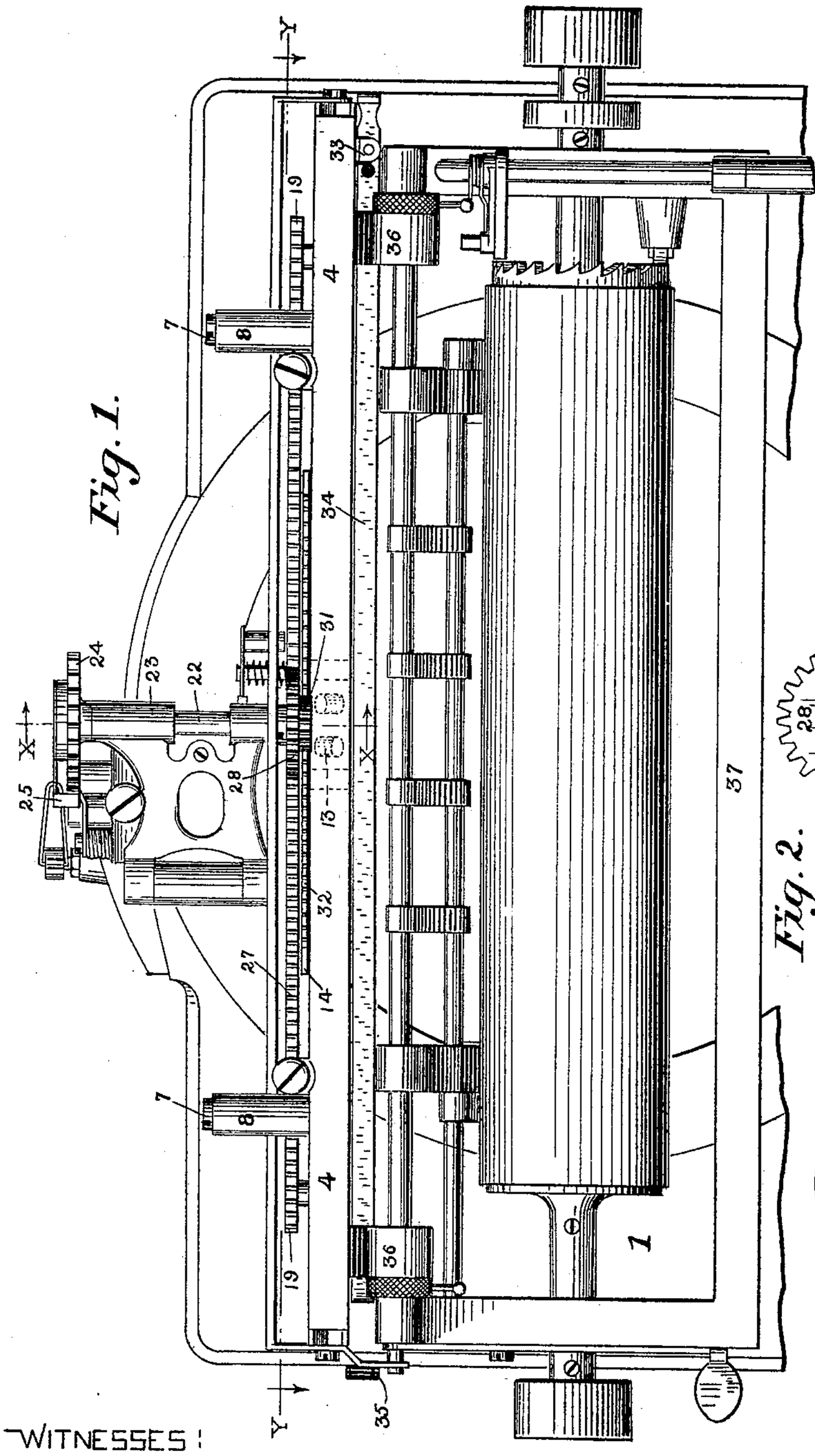

Fig. 1.

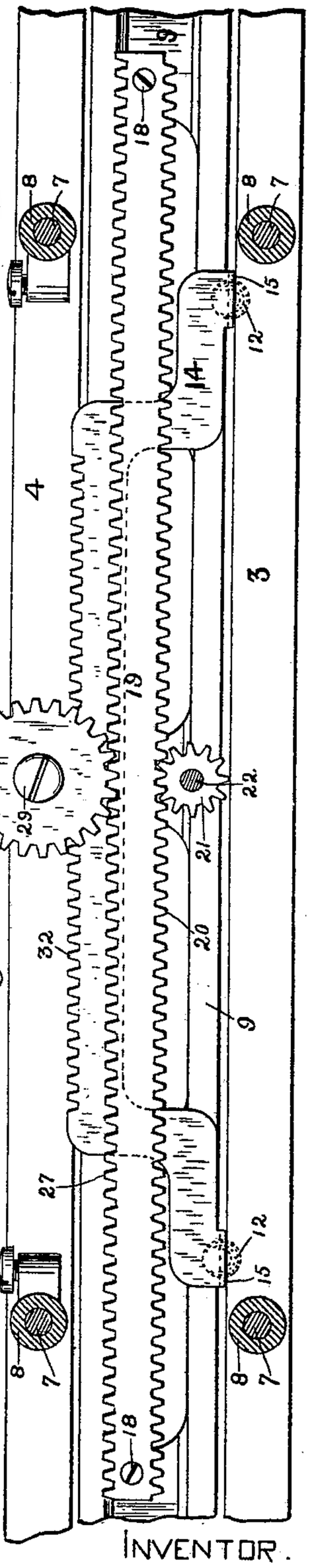

Fig. 2.

WITNESSES:

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Fig. 3.

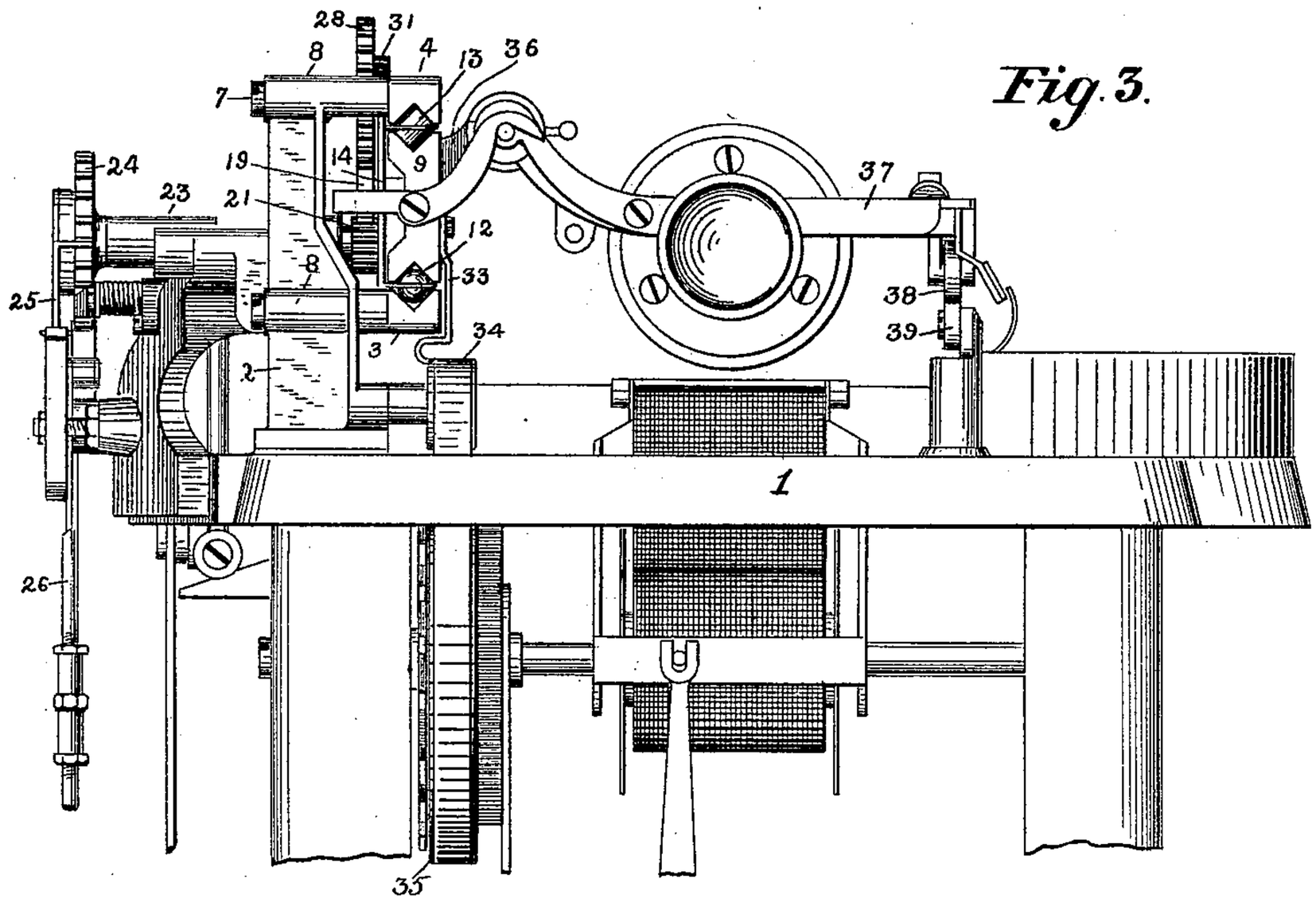

Fig. 4.

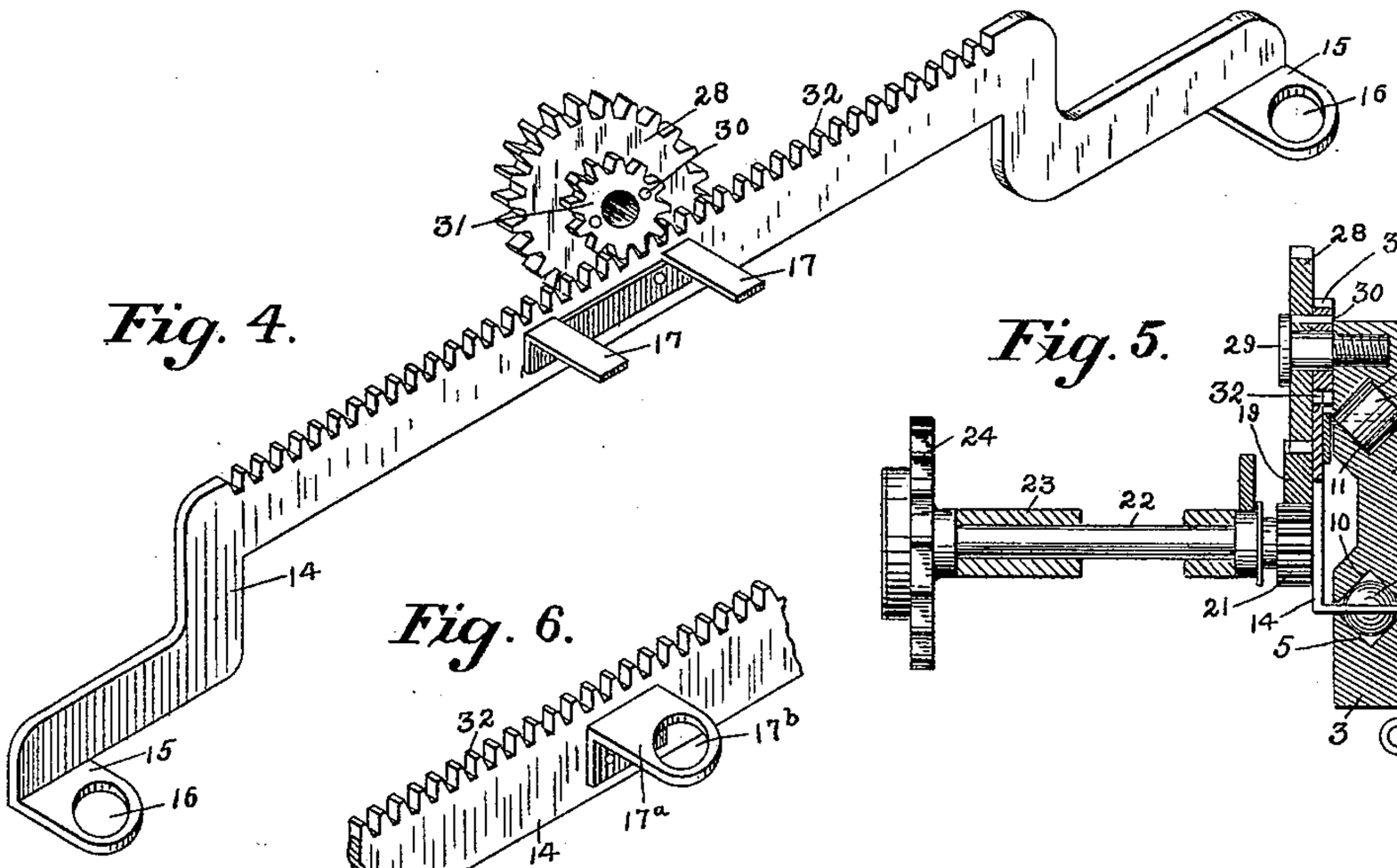

Fig. 6.

Fig. 5.

WITNESSES:

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UNITED STATES PATENT OFFICE.

LEWIS H. PERRY, OF NEW YORK, N. Y., ASSIGNOR TO THE AMERICAN WRITING MACHINE COMPANY, OF ILION, NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 635,942, dated October 31, 1899.

Application filed August 3, 1898. Serial No. 687,587. (No model.)

To all whom it may concern:

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

My invention relates to ball-bearings for carriages of type-writing and other machines and has reference more particularly to that species of ball-bearings in which the balls or rollers are provided with a holder or separator, as set forth in the Letters Patent of the United States granted to Charles W. Walker September 29, 1896, No. 568,645, and December 8, 1896, No. 572,845; and the main object of my invention is to so connect the ball holder or separator with the carriage as that it shall always have a fixed or constant relation thereto; and to this main end my invention consists, primarily, in gearing the carriage and the ball-holder together and also in certain other features of construction and relationship of parts and in various combinations of devices, all of which will be hereinafter more fully described, and particularly pointed out in the appended claims.

I have shown my invention embodied in that style of type-writing machines known as the "New Century Caligraph," and illustrated and described in an application for patent filed by Casper D. Wallace February 3, 1898, Serial No. 668,933.

In the accompanying drawings, Figure 1 is a top plan view of a portion of a type-writing machine of the style or construction above alluded to and also embodying my improvements. Fig. 2 is a vertical section on an increased scale and taken in the plane Y Y of Fig. 1. Fig. 3 is a left-hand end view of the machine. Fig. 4 is a detail perspective view of the ball-holder and its gearing. Fig. 5 is a vertical section taken on the line X X of Fig. 1; and Fig. 6 is a detail perspective view illustrating a modification in which a ball may be used at the central part of the ball holder or separator in lieu of two rolls, as shown in the other views.

In the various views the same part will be found designated by the same numeral of reference.

Upon the top plate 1 are mounted two uprights or posts 2, which support, one directly over the other, two fixed guide rails or bearings 3 4, the rail 3 having a V-shaped groove 5 on its upper side and the rail 4 having a V-shaped groove on its under side. The said rails are secured to the said uprights or posts by means of screws 7, which pass through tubular bosses 8 on said posts and engage at their threaded ends tapped holes in the rear side of said rails.

9 designates a bar or bar-like carriage which is formed on its under side with a V-shaped groove 10, facing the groove 5 in the rail 3, and on its upper side with a V-shaped groove 11, facing the groove 6 in the rail 4.

In the trackway formed by the grooves 5 and 10 are placed two antifriction-balls 12, and in the trackway formed by the grooves 6 and 11 are placed two antifriction-rolls 13, one arranged crosswise of or at right angles to the other. For the purpose of maintaining these balls and rolls in proper relationship to one another a ball holder or separator 14 is employed. This device consists of a bar arranged in a vertical plane, said bar having at each end a horizontally-disposed ear 15, perforated at 16 to receive and encompass one of the balls 12 and having centrally of its length two horizontally-projecting fingers 17, which embrace the two antifriction-rolls 13, the ears 15 extending forwardly between the upper side of the rail 3 and the lower side of the bar or carriage 9, and the fork or fingers 17 extending between the upper side of the bar or carriage 9 and the under side of the fixed rail 4. It will be seen that this device 14 maintains the balls 12 always in a fixed relation to each other and the rolls 13 in constant position relatively to the said balls, thus maintaining at all times several extended points of roller-bearing for the bar or carriage 9.

To the back of the carriage 9, at each end, is attached by screws 18 a bar 19, which is arranged in a vertical plane and is provided at its lower edge with a rack or set of gear-teeth

20, which mesh with a pinion 21, fast on a shaft 22, mounted in a bearing 23 and provided at its opposite end with a ratchet or escapement wheel 24, adapted to coöperate with a suitable escapement pawl or pawls, as 25, arranged to be actuated by an escapement-rod 26, connected to the key-lever system. (Not shown.) On the upper edge of the bar 19 is also formed or provided a rack or set of gear-teeth 27, with which engage the teeth of a gear-wheel 28, mounted on a fixed stud or pin 29, screwed into the top rail 4 about centrally of its length.

On the front side or face of the gear 28 is attached, by means of pins 30, a smaller gear wheel 31, which also turns on said stud and which engages with a rack or set of teeth 32, formed on the upper edge of the ball holder or separator.

At the right-hand end of the carriage is attached a downwardly-projecting stud or arm 33, to which is connected one end of a driving cord, strap, or chain 34, the other end of which is attached to the usual spring-drum 35, by which the carriage is propelled from right to left in the ordinary manner.

The movements of the carriage from right to left under the power of the driving-spring and from left to right for the beginning of a new line by the hand of the operator are communicated to the ball holder or separator by means of the gearing hereinbefore referred to. When the carriage moves from right to left, it turns the pinion 21 and the ratchet-wheel 24 through the medium of the rack 20, and at the same time it turns the gear-wheel 28 through the medium of the rack 27. The smaller gear 31, being attached to the gear 28, turns with the latter, and since the gear 31 meshes with the rack 32 on the ball holder or separator the latter is in consequence caused to travel from right to left with the carriage and the duplex rack-bar 19 secured thereto, and since the gears 28 and 31 are always in mesh with their respective racks 27 and 32 the ball-holder is likewise moved from left to right or in the opposite direction, when the carriage is moved from left to right or retracted to a position for the commencement of a new line of print. The balls or rolls, being loose or mounted to rotate freely and independently in their respective trackways, will travel only one-half the distance traversed by the carriage, and it is therefore essential that the ball holder or separator be geared to the carriage, so that it and the balls or rolls carried thereby shall have a travel equal to one-half that of the carriage travel, and to insure this result the smaller gear 31 is made one-half the diameter of the larger gear 28, both measured on their pitch-circles. By thus gearing together the carriage and the ball holder or separator the balls will always be maintained in proper relation to the carriage and to the feed of the latter, thereby overcoming the objection found to exist in mechanisms of this description wherein no means were provided for keeping the balls at all times moving properly with reference to the movements of the carriage. Without the described gearing the balls and ball-holder will creep or otherwise lose their proper relationship to the carriage. In the prior constructions means have been provided to automatically reset or restore the ball-holder; but such means operate only at the ends of the carriage travel, and hence are ineffectual in tabulating-work or where the carriage travel is limited to a distance less than the full or normal travel. By gearing the ball-holder to the carriage the balls are positively controlled at all points of the carriage travel, and hence can never lose their proper relationship thereto whether the carriage travel be long or short.

Projecting forwardly from the side of the carriage 9 are two lugs 36, to which is hinged the platen-carrier 37, which may be supported at its front side by a roller 38, running on a track or rail 39 in the usual manner. The carriage 9 and the platen-carrier 37 of course travel together, and the whole structure may be regarded as a carriage. Numerous other forms or constructions of carriage may obviously be employed in connection with my invention, and I therefore do not wish to be limited to the form, construction, or arrangement of carriage or carriages herein shown and described nor to the form, construction, or arrangement of the ball or roll holder, nor to the number of balls or rolls employed.

Referring to Fig. 6, the ball-holder 14 is provided centrally with a forwardly-extending ear 17^a, having a hole 17^b to receive a ball, as 12, in lieu of the two cylindrical rolls 13. So far as my invention is concerned it is immaterial whether the device designated as a "ball holder or separator" be provided with balls and rolls or with balls alone or rolls alone. In the claims I shall use the term "rollers," meaning thereby either spherical rolls, cylindrical rolls, or other forms of rolls, the term being intended to be generic for any and all forms of roller-bearing, including balls.

Various modifications of my invention may be made according to the style or construction of machine without departing from the spirit thereof, as hereinbefore set forth and as now more particularly expressed in the following claims.

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

1. In a type-writing machine, the combination with a paper-carriage and suitable letter-spacing mechanism therefor, whereby the carriage may be fed step by step variable distances, and returned to initial position, of suitable trackways extending longitudinally of the carriage, rollers so disposed in said trackways that they all coact to support and guide the carriage, means for constantly maintaining all of said rollers in their proper relative coacting positions, and means for pre-

venting the rollers from creeping along the trackways during the writing of consecutive short lines.

2. In a type-writing machine, the combination with a paper-carriage and suitable letter-spacing mechanism therefor, whereby the carriage may be fed step by step variable distances, and returned to initial position, of suitable trackways extending longitudinally of the carriage, rollers so disposed in said trackways that they all coact to support and guide the carriage, a single holder for all of said rollers, and means for positively limiting the movement of said holder and said rollers during the writing of consecutive short lines.

3. In a type-writing machine, the combination with a paper-carriage and suitable letter-spacing mechanism therefor, whereby the carriage may be fed step by step variable distances, and returned to initial position, of suitable trackways extending longitudinally of the carriage, rollers so disposed in said trackways that they all coact to support and guide the carriage, and a single holder for all of said rollers, the movements of said holder being positively controlled by the carriage.

4. In a type-writing machine, the combination with a paper-carriage and suitable letter-spacing mechanism therefor, of suitable trackways extending longitudinally of the carriage, rollers so disposed in said trackways that they all coact to support and guide the carriage, a single holder for all of said rollers, and movement-reducing gearing between the carriage and the roller-holder.

5. In a type-writing machine, the combination with a step-by-step movable paper-carriage of suitable trackways extending longitudinally thereof, rollers so disposed in said trackways that they all coact to support and guide the carriage, a single holder for all of said rollers, and racks and gear-wheels for connecting the roller-holder to the carriage.

6. In a type-writing machine, the combination with a step-by-step movable paper-carriage of suitable trackways extending longitudinally thereof, rollers so disposed in said trackways that they all coact to support and guide the carriage, a single holder for all of said rollers, and gearing for moving the latter.

7. In a type-writing machine, the combination with a step-by-step movable paper-carriage of suitable trackways extending longitudinally thereof, rollers so disposed in said trackways that they all coact to support and guide the carriage, a single holder for all of said rollers, a stud, two gear-wheels of unequal diameter connected together and mounted on said stud, a rack attached to the carriage for controlling the larger of said gear-wheels, and a rack on the roller-holder in mesh with the smaller of said gear-wheels.

8. In a type-writing machine, the combination of guide-bars having opposite roller-bearings, a step-by-step movable paper-carriage having roller-bearings matching the bearings on the guide-bars, supporting and guiding rollers arranged to work in said bearings, a single holder for all of said rollers, and means for connecting said roller-holder to the carriage.

9. In a type-writing machine, the combination of guide-bars having opposite roller-bearings, a step-by-step movable paper-carriage having roller-bearings matching the bearings on the guide-bars, supporting and guiding rollers arranged to work in said bearings, a single holder for all of said rollers, and gearing between the carriage and the roller-holder.

10. In a type-writing machine, the combination of guide-bars having opposite roller-bearings, a step-by-step movable paper-carriage having roller-bearings matching the bearings on the guide-bars, supporting and guiding rollers arranged to work in said bearings, a single holder for all of said rollers, a rack on the roller-holder, a gear in mesh therewith, and means for enabling the carriage to control said gear.

11. In a type-writing machine, the combination of guide-bars having opposite roller-bearings, a step-by-step movable paper-carriage having roller-bearings matching the bearings on the guide-bars, supporting and guiding rollers arranged to work in said bearings, a single holder for all of said rollers, said roller-holder being provided with a rack, a stud attached to one of the guide-bars, two connected gear-wheels constructed to turn on said stud, one of said gear-wheels being half the diameter of the other, and the smaller gear-wheel meshing with the rack on the roller-holder, and the larger gear-wheel meshing with a rack on the carriage.

12. In a type-writing machine, the combination of a paper-carriage, suitable trackways extending longitudinally thereof, rollers so disposed in said trackways that they all coact to support and guide the carriage, a single holder for all of said rollers, a carriage-driving spring, an escapement-wheel provided with any suitable connections to the finger-keys, and means for enabling said escapement-wheel positively to limit the advance movements of said roller-holder.

13. In a type-writing machine, the combination with a paper-carriage, suitable trackways extending longitudinally thereof, rollers so disposed in said trackways that they all coact to support and guide the carriage, a single holder for all of said rollers, a carriage-driving spring, an escapement-wheel provided with any suitable connections to the finger-keys, a shaft for said escapement-wheel, and means for enabling said shaft to limit all of the movements of said roller-holder.

14. In a type-writing machine, the combination with a paper-carriage and suitable letter-spacing mechanism therefor, of suitable trackways extending longitudinally of the carriage, and a rack, as 32, in mesh with an escapement-controlled gear-wheel, as 31, said rack having formed thereon means for engaging a series of rollers so disposed in said

trackways as to support and guide the carriage.

15. In a type-writing machine, the combination with a paper-carriage and suitable letter-spacing mechanism therefor, of a suitable trackway extending longitudinally of the carriage, and an escapement-controlled rack, as 32, having integral means for engaging carriage-bearing rollers disposed in said trackway.

16. In a type-writing machine, the combination with a paper-carriage and suitable letter-spacing mechanism therefor, of a suitable trackway extending longitudinally of the carriage, and an escapement-controlled rack, as 32, having ears, as 15, thereon for engaging carriage-bearing rollers disposed in said trackway.

17. In a type-writing machine, the combination with a paper-carriage and suitable letter-spacing mechanism therefor, of a suitable trackway extending longitudinally of the carriage and an escapement-controlled rack, as 32, having ears thereon, bent at right angles thereto, and projecting into said trackway for engaging bearing-rollers disposed therein.

18. In a type-writing machine, the combination with a paper-carriage and suitable letter-spacing mechanism therefor, of two suitable parallel trackways extending longitudinally of the carriage, and an escapement-controlled rack, as 32, having ears thereon, as 15, 17, bent at right angles thereto, and projecting into said trackways for engaging bearing-rollers disposed therein.

Signed at the borough of Manhattan, in the city of New York, in the county of New York and State of New York, this 2d day of August, A. D. 1898.

LEWIS H. PERRY.

Witnesses:

PAUL ARMITAGE,

K. V. DONOVAN.