A. LOPEZ.

TYPE WRITING MACHINE.

APPLICATION FILED APR. 1, 1912.

1,155,828.

Patented Oct. 5, 1915.

2 SHEETS—SHEET 1.

Fig. 7.

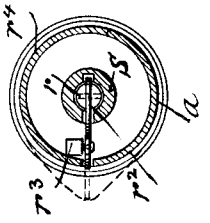


Fig. 1.

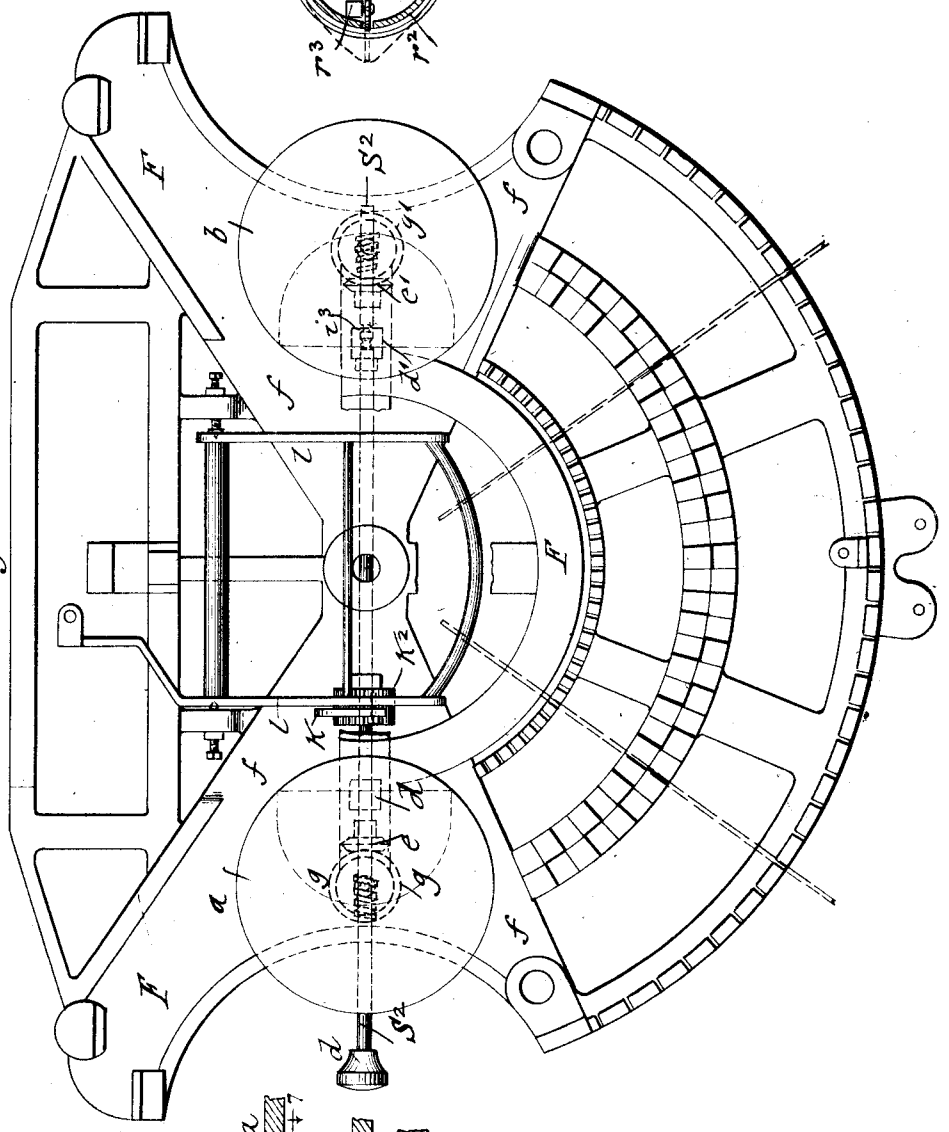
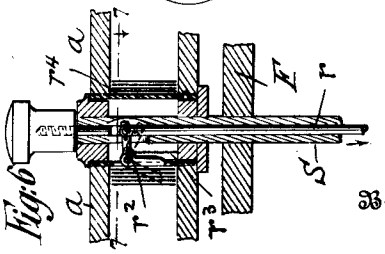


Fig. 6.



Witnesses:

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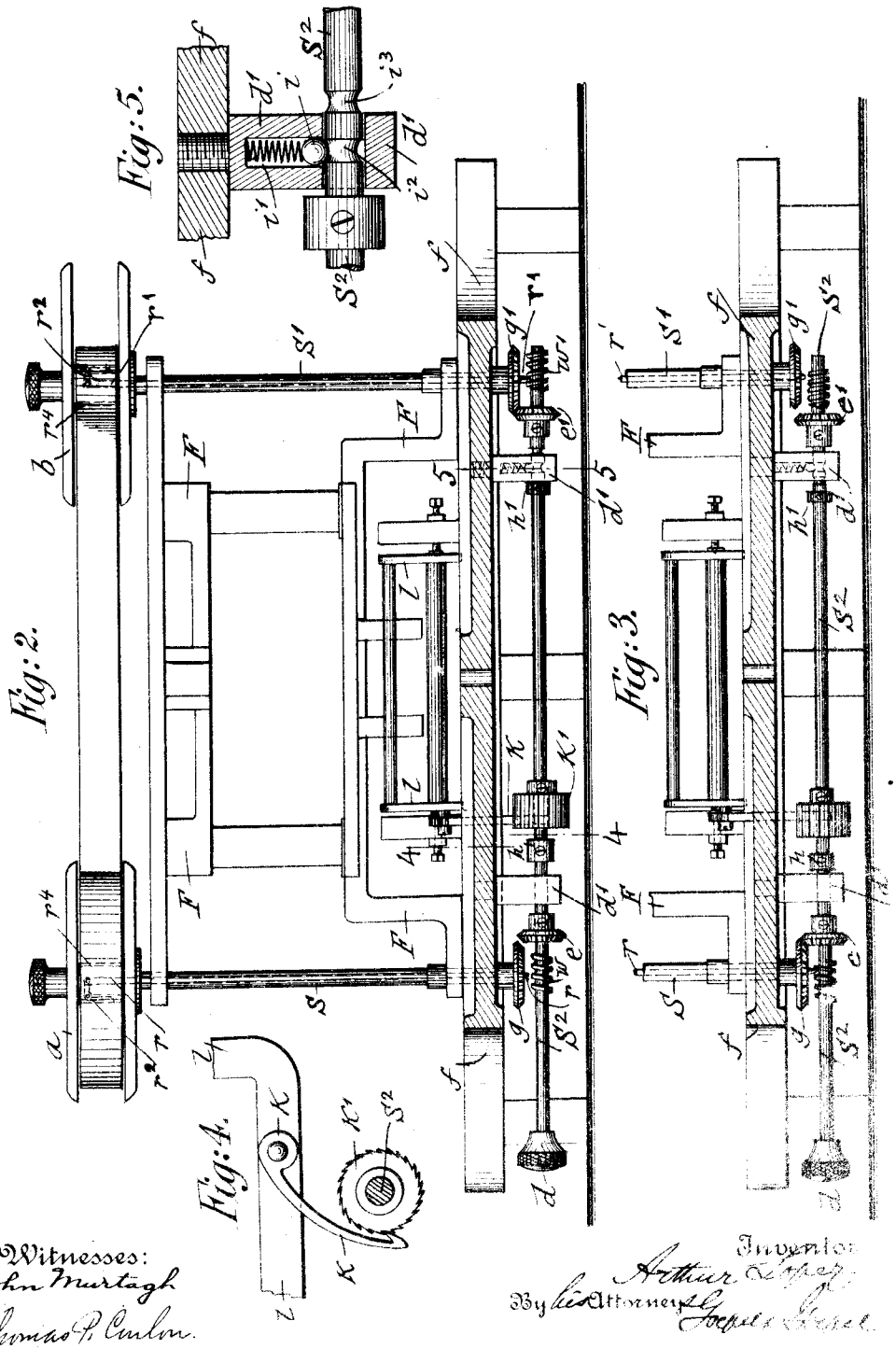
2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ARTHUR LOPEZ, OF NEW YORK, N. Y., ASSIGNOR TO THE HAMMOND TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,155,828. Specification of Letters Patent. Patented Oct. 5, 1915.

Application filed April 1, 1912. Serial No. 687,671.

To all whom it may concern:

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

This invention relates to an improved reversing device for the ribbons of typewriting machines, and more especially for the ribbons of Hammond typewriters, by which the motion of the ribbon is automatically reversed when unwound from one spool and rewound on the other spool so that the manual rewinding of the ribbon from one spool to the other is dispensed with; and for this purpose the invention consists of a reversing attachment for typewriting machines which comprises two spools to which the ends of the ribbon are applied and a reversing gear located below the base-plate of the machine and adapted to be placed alternately into mesh with the shaft of the spools for reversing the motion of the ribbon.

The invention consists further of means applied to the spool of each ribbon and connected with the driving shaft of the reversing mechanism by means of a gravity-rod which passes through the hollow shaft of the spool and engages a worm of the reversing shaft for producing the automatical shifting of the reversing gear so that the ribbon is unwound from one spool and wound up on the other, or vice versa.

The invention consists further of certain details of construction which will be fully described hereinafter and finally pointed out in the claim.

In the accompanying drawings, Figure 1 represents a plan-view of a Hammond typewriting machine, with my improved ribbon reversing attachment, applied thereto, Fig. 2 is a front elevation partly in section through the base-plate, and showing the parts in position for winding up the ribbon on the right hand spool, Fig. 3 is a similar section, showing the reversing attachment in position for winding up the ribbon on the left-hand spool, Figs. 4 and 5 are details, respectively on lines 4, 4, and 5, 5, Fig. 2, Fig. 6 is a detail section drawn on a larger scale through the center of one of the spools, and Fig. 7 a detail horizontal section on line 7, 7, Fig. 6.

Similar letters of reference indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, *a* represents the left-hand and *b* the right hand spool of a typewriting machine, having two spools for winding the ribbon from one spool to the other. In the drawing the reversing device is shown as applied to a Hammond typewriting machine, but it is obvious that it can be used with any other machine using two spools. The spools *a* and *b* are placed on the upper ends of tubular vertical shafts S, S′ which turn in neck and step-bearings in the frame F of the machine. The shafts S, S′ are extended below the base-plate *f* of the machine and provided at their lower ends below the same with bevel gear-wheels *g*, *g*′, the hubs of which are mounted on the lower ends of the tubular shafts S, S′. Below the bevel gear-wheels *g*, *g*′ and in a vertical plane passing through the axes of the spool-shafts S, S′ is arranged a horizontal reversing shaft S^2 which is provided with a button *d* at one end. The reversing shaft S^2 is supported in bearings of hangers *d*′ that are attached to the underside of the base-plate *f*, as shown clearly in Fig. 5, and which shaft is capable of being shifted therein for a short distance. On the shaft S^2 are mounted bevel-pinions *e*, *e*′, one near the bevel gear-wheel *g*, and the other near the bevel gear-wheel *g*′, in such a manner that when the shaft S^2 is shifted in its bearings toward the right the right hand bevel-pinion *e*′ meshes with the bevel gear-wheel *g*′ on the shaft of the right-hand spool, while when the reversing shaft S^2 is shifted toward the left, the left hand bevel-pinion will be placed in mesh with the bevel gear-wheel on the shaft of the left hand spool. For the purpose of securing the exact degree of shifting motion required for placing either bevel-pinion *e* or *e*′ into mesh with its bevel gear-wheel *g* or *g*′ the shaft S^2 is provided with collars *h*, *h*′ near the hangers *d*, *d*′, which act as stops for arresting the motion of the shaft in one or the opposite direction. For preventing the too easy shifting of the reversing shaft, a friction-device is employed in one of hangers *g*

or g', which is shown in detail in Fig. 5, and which consists of a spring-actuated ball i, that is located in a socket i' in the upper part of the bearings g or g' and adapted to engage one or the other of two annular grooves i^2, i^2 which are arranged on the reversing shaft so as to require a certain degree of force for shifting the reversing shaft into bearings from one side to the other and back again.

The ribbon r, whether of one color, or a compound ribbon composed of two or more different colors, is attached at its ends to shells surrounding the spool-shafts in the usual manner and then wound up for a sufficient length around one of the spools. The winding of the ribbon r is accomplished simultaneously with the printing of the type by a lever-mechanism l operated by the type-keys so as to impart to the reversing shaft S^2 an intermittent rotary motion by means of a pawl and ratchet-mechanism K, K', which is shown in detail in Fig. 4. The ratchet-wheel K' is mounted on the reversing shaft so that a step-by-step rotary motion is given to the reversing shaft by the actuation of the keys, which rotary motion is transmitted by the bevel gear-wheel transmission e, g or e', g' to the shaft of the left or right-hand spool according as the bevel gear-wheel of one or the other is in mesh with the bevel-pinion at one or the other end of the reversing shaft. The pawl K is pivoted to one arm of an oscillating lever l operated by the keys so that at each depression of a key and the printing of a type corresponding herewith, the ribbon is moved simultaneously in one or the opposite direction according as either the bevel gear-wheel of the left or right-hand spool a or b is placed in mesh with the bevel pinion on the left or right hand end of the reversing shaft. When the ribbon is wound up to its full extent on the right-hand spool, the reversing shaft is shifted by hand from the position shown in Fig. 2 into the position shown in Fig. 3, so that the bevel-pinion on the right hand side is placed out of mesh with the bevel gear-wheel on the right hand spool shaft and the bevel-pinion on the left hand end of the shaft placed in mesh with the bevel gear-wheel on the left hand spool-shaft whereby the motion of the ribbon is reversed and the same wound up on the left hand spool. When the ribbon is wound up on the left hand spool, the reversing shaft is pushed toward the right so that its left-hand bevel-pinion is placed out of mesh with the bevel gear-wheel on the left-hand spool shaft and the bevel-pinion on the right hand end of the shaft placed in mesh with the bevel gear-wheel on the right-hand spool shaft and the ribbon wound upon the right hand spool. As the reversing shaft is always rotated in the same direction, the ratchet wheel K' has to be made of sufficient width so as to be always engaged by the pawl K regardless of the shifting motion of the shaft.

The ribbon can also be automatically reversed without interrupting the working of the machine. This is accomplished by inserting into the tubular shafts S, S', of the ribbon-spools vertical slide-rods r, r', which are connected at their upper slotted ends with elbow levers r^2 that are fulcrumed to posts r^3 in the cylindrical shell or bushing r^4 of the spools, the upper arms of the elbow-levers r^2 projecting into a slot in the upper ends of the slide-rods r, r'. The lower end of each slide-rod, r, r' projects below the bevel gear-wheel g or g' at the lower end of the spool-shaft S and engages by its pointed end a worm w or w' on the reversing shaft S^2 so that as soon as the ribbon is nearly unwound from one spool the tension of the ribbon on the lower arm of the fulcrumed elbow-lever is relieved, and the slide-rod r or r' dropped by gravity with its pointed end into one of the convolutions of the worm w or w' and the reversing shaft shifted by the action of the same and the intermittent rotary motion imparted to the shaft by the pawl and ratchet mechanism, so that one of the bevel-pinions on the reversing shaft is placed into mesh with a bevel gear-wheel on the spool-shaft S or S' while the bevel-pinion at the other end of the reversing shaft is moved out of mesh with the bevel-gear-wheel at the lower end of the other spool-shaft so as to produce the turning of the latter and the rewinding of the ribbon on the empty spool. By the tension of the ribbon which is being wound on the empty spool, the elbow lever fulcrumed to the inner shell or bushing of the spool is pressed inwardly and thereby the slide-rod lifted so that its lower pointed end is moved out of engagement with the worm w or w' on the reversing shaft as shown at the left-hand side of Fig. 1, and at the right-hand side of Fig. 2. The automatic dropping of the slide-rods r, r' and the engagement of the lower ends of the same with the convolutions of the worms w, w' on the shaft of the reversing gear, produce the automatic reversing of the winding-up motion of the ribbon so that the same is unwound from the full spool and rewound on the empty spool and vice versa, without interrupting the working of the machine and without being noticed by the operator.

The hand-operated button on the left-hand end of the reversing shaft is used only in case of need, or when it is necessary to insert a new ribbon, and in turning either one of the spools for winding up a portion of the ribbon thereon. By the automatic reversing motion imparted to the ribbon by the reversing attachment described, the rib-

bon is wound up in a quicker effective manner from one spool to the other than by the manual working heretofore employed.

I claim:

In a typewriting machine, the combination with horizontally arranged ribbon spools having a central shell or bushing provided with a vertical slot therein, of vertical cylindrical spool-shafts extending within said bushings, the said shafts being provided with vertically disposed slots within said bushings, vertical slide-rods guided in said shafts and extending through the same within the said bushings, a horizontal shiftable reversing shaft supported in bearings on the base-plate of the machine, bevel gears on the reversing shaft, and bevel gears on the vertical shafts, adapted to be alternately engaged by the gears of the reversing shaft, worms on the said shaft adapted to be engaged by the lower ends of the slide-rods, elbow-levers fastened within the slots of the said bushings, one arm of the said lever adapted to be held flush with the surface of the said bushing in one position of movement when engaged by the ribbon wound around the same, the other arm of the said lever extending through the said slot of the shaft and engaging the slide-rod therein, and holding the same raised from the said worm-gear of the shiftable reversing shaft, the weight of the said arm being adapted to cause the same to drop down into engagement with the said worm-gear upon release of the said elbow-lever by the ribbon, the engagement of the said rods with the respective worm-gears adapted to cause an alternate shifting of the said shiftable reversing shaft, to cause a reversal of the action of the ribbon spools.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

ARTHUR LOPEZ.

Witnesses:

PAUL GOEPEL,

JOHN MURTAGH.