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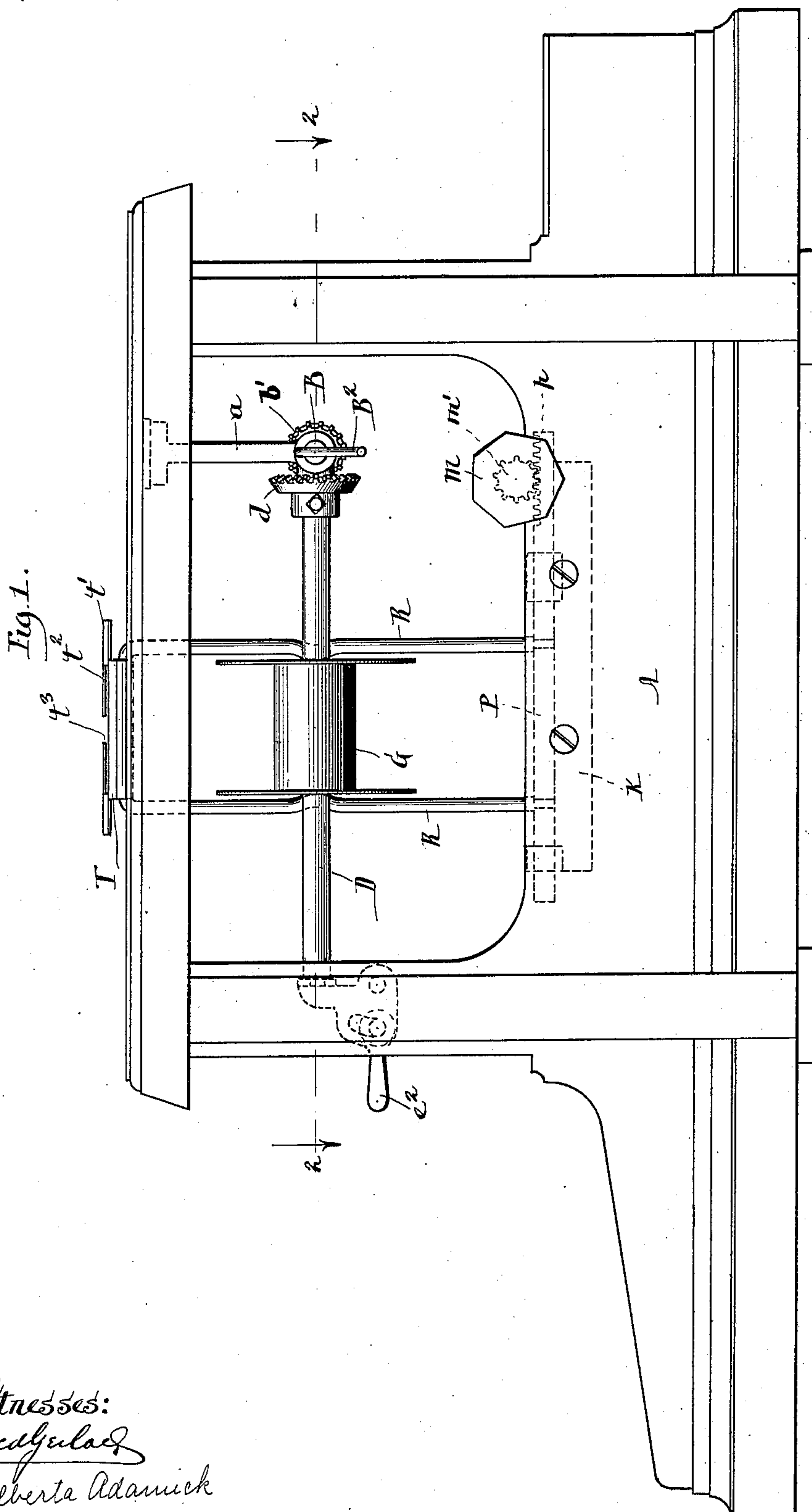
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RIBBON MECHANISM FOR TYPE WRITING MACHINES.

(Application filed Jan. 13, 1897.)

(No Model.)

3. Sheets—Sheet 1.



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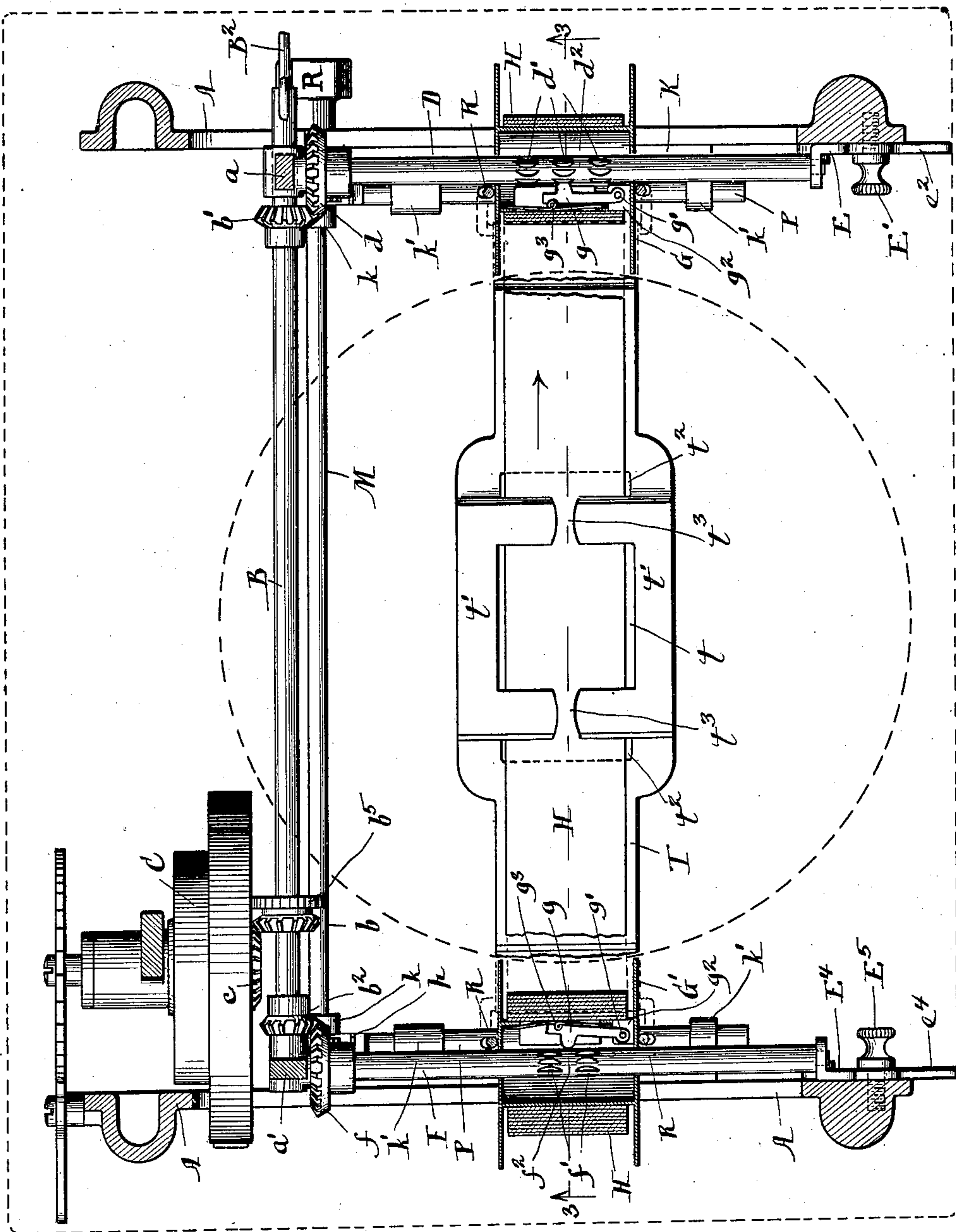
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3 Sheets—Sheet 2.

Fig. 2.



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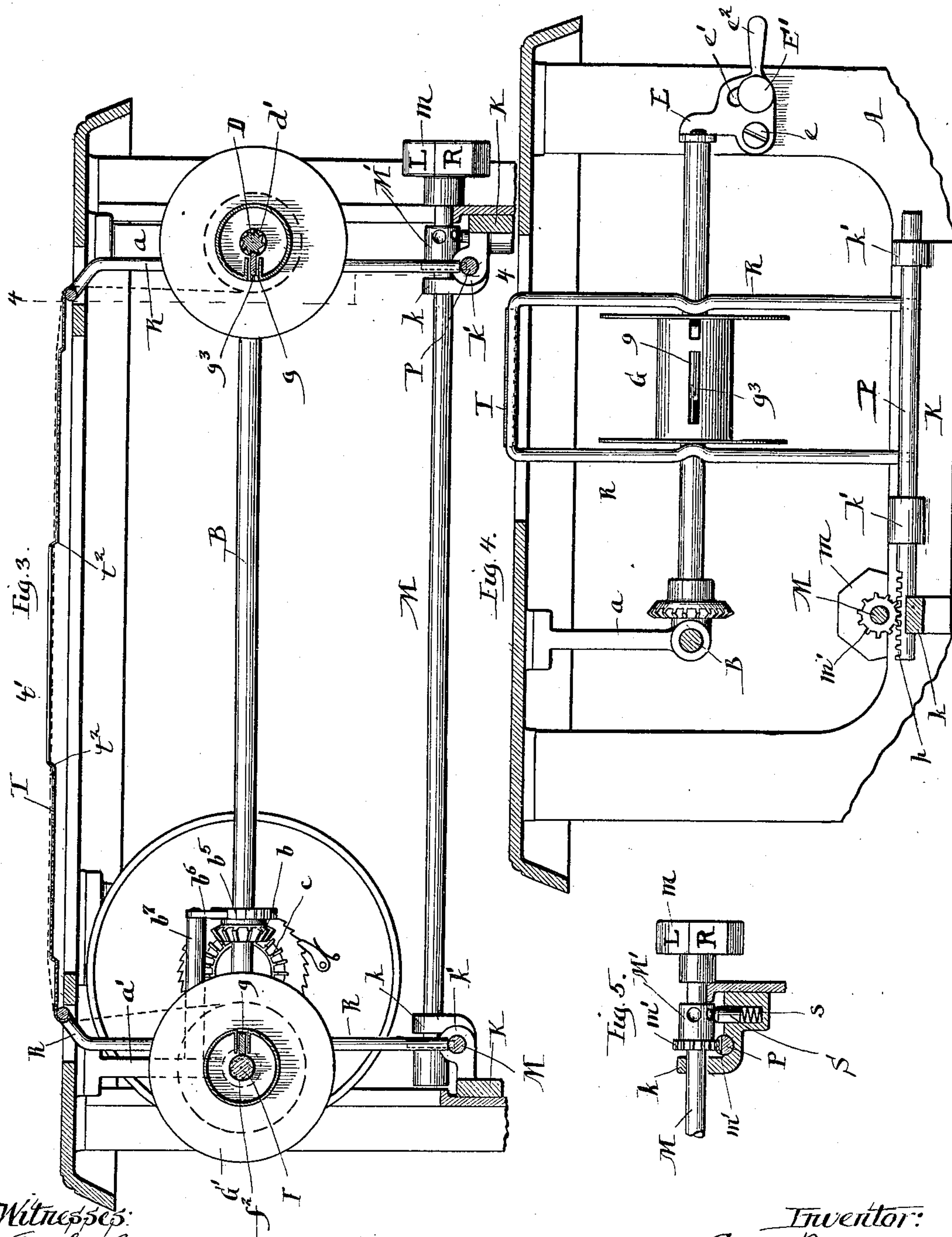
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RIBBON MECHANISM FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 629,438, dated July 25, 1899.

Application filed January 13, 1897. Serial No. 619,034. (No model.)

To all whom it may concern:

Be it known that I, CHARLES N. FAY, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Inking-Ribbon-Feed Mechanism for Type-Writing Machines, of which I do declare the following to be a full, clear, and exact description.

In type-writing machines in which inking-ribbons are employed it is customary to employ suitable mechanism for shifting the inking-ribbon in order to expose a new surface to the impact of the type. An example of one type of such mechanism is found in the old "Remington No. 2" machine, in which the ribbon is wound by a step-by-step movement from a ribbon-spool at one side of the machine onto a corresponding spool at the opposite side of the machine, and when the ribbon has reached the end of its travel the direction of rotation of the spools is reversed and at the same time the spools are shifted laterally a slight distance, so that as the direction of travel of the ribbon is reversed a fresh surface will be exposed to the impact of the type.

My present invention has relation to the above-mentioned means for effecting the feeding of the inking-ribbon—viz., that by which the ribbon is advanced step by step in the direction of its length until it is wound from the spool at one side of the machine onto the spool at the opposite side; and the object of the invention is to provide a simple and effective means for feeding the ribbon and for enabling the spools to be shifted laterally in order that the impact of the type may occur in parallel lines throughout the length of the ribbon until its surface is exhausted.

The invention consists of the novel features hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the claims at the end of this specification.

Figure 1 is a view in side elevation of a type-writing machine having my invention applied thereto. Fig. 2 is a view in horizontal section on line 2 2 of Fig. 1. Fig. 3 is a view in vertical cross-section on line 3 3 of Fig. 2. Fig. 4 is a view in vertical longitudinal section on line 4 4 of Fig. 3. Fig. 5 is a detail view, partly in vertical section and partly in elevation, showing more particu-

larly the right-hand end of the operating-shaft and the check-pawl mechanism adjacent thereto.

A designates the main frame of the machine, from the top plate of which depend suitable hangers *a* and *a'*, in the lower ends of which are journaled the ends of the transverse shaft B. Upon the shaft B is keyed a beveled pinion *b*, that meshes with a beveled pinion *c*, that is fixed to the shaft of the usual winding-drum C. The winding-drum C is sustained in usual or any suitable manner and being of well-known construction need not be particularly described, it being the drum on which is wound the tape whereby the carriage of the machine is retracted from right to left. To the shaft B are also keyed the beveled pinions *b'* and *b''*, the pinion *b'* meshing with a pinion *d* upon a shaft D, the rear end of which shaft is journaled in a suitable bearing at the end of the hanger *a*, while its front end is journaled in a bracket E, that is preferably pivoted, as at *e*, to one of the uprights of the main frame, as clearly seen in Figs. 1, 2, and 4 of the drawings. The bracket E is shown as provided with a long slot *e'*, through which passes a set-screw E', whereby the bracket may be rigidly set in vertical position, and at the front of the bracket E is formed a handle *e''*, whereby the bracket may be shifted. The beveled pinion *b''* on the shaft B meshes with a corresponding pinion *f*, keyed to the shaft F. The rear end of this shaft F is journaled in a bearing at the lower end of the hanger *a'*, while the front end of this shaft is journaled in a bracket E', corresponding to the bracket E above described, and in like manner pivoted to one of the uprights of the main frame, this bracket E' being provided with a slot and with a set-screw E'' and with a handle *e'''*, whereby the bracket may be manipulated.

Upon the shafts D and F are mounted, respectively, the ribbon-spools G and G', these spools being free to slide longitudinally on the shafts. Each of the shafts D and F has its surface formed with several annular series of peripheral ratchet teeth or notches *d'* and *f'* and with intermediate plain spaces *d''* and *f''*, and each of the spools G and G' is provided with a suitable pawl or latch *g*, adapted to engage with the series of teeth or notches or

to ride upon the spaces between the series of notches. Each of the pawls g is shown as pivoted, as at g' , to lugs g^2 , that project inwardly from one of the heads of the spools, and upon the free end of each pawl g bears a spring g^3 , that serves to force the pawl g normally toward the corresponding shaft, the outer end of the spring bearing against the interior of the hub of the spool. By reference more particularly to Fig. 2 of the drawings it will be seen that inasmuch as the pinions b' and d and b^2 and f are in constant engagement the spool-shafts D and F will be constantly driven from the transverse shaft B. When one of the spools—for example, G—is so positioned upon its shaft D that its pawl g is in engagement with one of the series of teeth d' , the spool G will partake of the step-by-step movement that is imparted to the shaft D from the shaft B and the tape-drum C; but at such time the pawl g of the ribbon-spool G' at the opposite side of the machine will bear upon the interdental surface of the shaft F, and consequently the spool G' will not be revolved by such shaft. Hence it will be seen that as the spool G is revolved by the shaft D the inking-ribbon H, that extends between the spools, will be wound onto the spool G and from off the spool G'. As soon as the ribbon has been completely wound from off the spool G' the operator will, by mechanism to be presently described, shift the spools G G' so that the pawl or latch g of the spool G' will pass into engagement with one of the annular series of ratchet teeth or notches f' , while the pawl g of the spool G will pass from engagement with the ratchet-teeth d' and will ride upon the smooth surface d^2 of the shaft D. When this shift of the spools has been effected, the spool G' will then partake of the revolution imparted to the shaft F from the shaft B and drum C, while the spool G may be turned independently of the shaft D, whereon it is mounted; and it will thus be seen that the ribbon will be rewound onto the spool G' from the spool G, and by reason of the lateral shift of the ribbon-spools a new surface of the ribbon H will be exposed to the impact of the type as the ribbon is advanced under the influence of the winding-drum. Whenever it becomes necessary to remove the spools G G' from their shafts, the thumb-screws E' and E^5 will be loosened, thereby permitting the brackets E and E^4 to be turned forwardly, so as to free the front ends of the shafts D and F, and when the rear ends of the shafts are withdrawn from their bearings the spools can be readily removed from the front ends of the shafts. It will be observed by reference to Fig. 2 that the notches d' and f' of the shafts D and F have inclined bottoms and the ends of the latches and the engaging ends of the pawls g are preferably rounded, so as to permit the easy lateral shift of the spools G G' upon their shafts.

The mechanism whereby a longitudinal shift of the spools G G' is effected will next

be described. Upon the inner face of each of the sides of the main frame A is fixed a bracket-plate K, having the upwardly-extending arms k , that form bearings for the operating-shaft M, one end of this shaft extending through the side wall of the main frame and being provided with a hand-wheel m , whereby the shaft may be turned. Each of the plates K is also provided with brackets k' , (see Fig. 4,) in which is held in manner free to slide a bar P, the rear end of which is provided with a rack p , that engages a pinion m' , fixed to the operating-shaft M. From each of the slide-bars P rises a shifter for engaging the ribbon of the corresponding ribbon-spool, and this shifter consists, preferably, of a bent wire R, the legs of which stand upon opposite sides of the corresponding spool, while the upper end of the wire extends through a long slot formed in the top plate of the machine, as clearly shown in Figs. 3 and 4. It will thus be seen that as the operating-shaft M is turned the slide-bars P may be moved back and forth and a corresponding shift of the spools G and G' will be effected. By reference more particularly to Fig. 2 of the drawings it will be observed that when the pawl g of the spool G, for example, is in engagement with the shaft D the pawl g of the spool G' will be disengaged from the teeth or notches of the shaft F, and vice versa, and by turning the hand-wheel m and the shaft M the proper fractional part of a revolution not only will the spools G and G' be alternately engaged with and disengaged from their shafts in order to reverse the direction of travel of the ribbon, but if the extent of revolution of the operating-shaft M be accurately determined it will insure that the spools G and G' shall be so shifted as to move the ribbon exactly the space necessary to expose a fresh surface to the impact of the type. In order to enable the operating-shaft M to be given the proper fractional part of a revolution, I prefer to form the hand-wheel m of polygonal shape, its peripheral surfaces being marked with suitable letters—as, for example, “R” and “L”—to indicate the direction of travel that will be given to the inking-ribbon when the corresponding surface of the hand-wheel m is uppermost. I prefer also to provide one or both ends of the operating-shaft M with a check-wheel M', (see Fig. 5,) the periphery of which is provided with a series of conical notches or seats adapted to receive the beveled end of a check-pawl S, that is placed within a seat formed in the bracket-plate K and is pressed normally into engagement with the wheel M by means of a spiral spring s , set within the seat wherein the pawl S is held. The notches of the wheel M will correspond with the faces of the hand-wheel m , and these will correspond also with the annular series of teeth or notches and interdental spaces in the spool-shafts D and F. Hence it will be seen that when the operator turns the shaft M by means of the hand-wheel m in order to

shift the ribbon-spools the check-pawl S will be depressed against the force of the spring K until the pawl is free to enter the next succeeding notch of the wheel M', and when this occurs the spools G G' will have been moved longitudinally a proper distance to reverse the direction of travel of the ribbon and to expose a fresh surface to the impact of the type.

10 In order to prevent the body of the ribbon H (except its central portion) from being brought into contact with the paper being written upon as the ribbon is thrown upward by the type, I prefer to extend between each of the spool-shifters R a guide-plate T. (See Figs. 2 and 3.) This guide-plate T is preferably formed of sheet metal, the ends of the plate being bent downwardly to drop between the angular upper portions of each of the spool-shifters R. The plate T is formed with the central cut-away space t , through which the type will strike upward to force the ribbon against the paper, and at each side of this central space is formed a raised portion t' , at each end of which is a slot t^2 , through which the inking-ribbon will pass. Preferably the raised portions t' of the plate T are formed with slots t^3 to permit the plate to be readily placed upon the ribbon. By means of the plate T the inking-ribbon H will be held in such manner that only that part of the ribbon adjacent the central portion of the machine will be thrown upward against the paper, and all danger of blurring the paper by the contact of other parts of the ribbon therewith will thus be avoided.

If desired, the shaft B may be provided at one end with a crank B², whereby the shaft can be turned by hand in order to wind the ribbon H onto the spools G and G'. So, also, the shaft B may be provided with a ratchet-wheel b^5 , that will be engaged by a pawl b^6 , carried by a stud b^7 , projecting from the hanger a' , the ratchet wheel and pawl serving to guard the shaft B against any accidental turning as the tape-drum is shifted in moving the carriage toward the right.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine the combination with two spool-shafts in constant gear with the mechanism whereby they are propelled, of spools mounted upon said spool-shafts in manner free to slide thereon, means for longitudinally shifting the ribbon-spools upon their shafts, and oppositely-arranged latch mechanism for connecting the spools to their shafts, whereby when the spools are shifted alike one will be thrown into and the other will be thrown out of engagement with their respective shafts.

2. In a type-writing machine the combination with a carriage-propelling mechanism, of a transverse shaft in gear therewith, two spool-shafts in constant gear with said transverse shaft and arranged to revolve in opposite di-

rections, ribbon-spools mounted upon said spool-shafts in manner free to slide thereon, means for shifting the ribbon-spools upon their shafts, said shafts and spools being provided with oppositely-arranged automatic latch mechanism for connecting the spools to their shafts, whereby when the spools are longitudinally shifted one will be thrown into and the other will be thrown out of engagement with their respective shafts.

3. In a type-writing machine the combination with a carriage-propelling mechanism, of spool-shafts in gear therewith, spools mounted upon said shafts, means for shifting said spools longitudinally and oppositely-arranged pawl-and-ratchet mechanism between the spool-shafts and their spools whereby when one spool is thrown into engagement with its shaft the other will be disengaged from its corresponding shaft.

4. In a type-writing machine the combination with a carriage-propelling mechanism, of spool-shafts in gear therewith and provided with a series of teeth or notches and intermediate annular plain spaces whereon pawls may ride, ribbon-spools upon said shafts and pawls or latches adapted to engage the teeth or notches or ride upon the interdental spaces of the shafts.

5. In a type-writing machine the combination with a carriage-propelling mechanism, of spool-shafts in gear therewith and each provided with several annular series of teeth or notches and with intermediate annular plain spaces whereon pawls may ride, ribbon-spools upon said shafts and pivoted pawls or latches carried by said ribbon-spools and adapted to engage the annular series of notches or teeth or ride upon the annular plain surface of the shaft.

6. In a type-writing machine, the combination with the spool-shafts and spools, of means for shifting the spools lengthwise comprising shifters for engaging said spools, slide-bars to which said shifters are connected, a shaft extending across the machine and suitably connected with said slide-bars to reciprocate said bars, one end of said shaft being extended outside of the machine-frame and being provided with a hand-wheel whereby said shaft may be manipulated in order to shift the spools back and forth.

7. In a type-writing machine, the combination with the spool-shafts and spools, of means for shifting the spools lengthwise comprising an operating-shaft extending from side to side of the machine and having one end extending outside the machine-frame and provided with means whereby the shaft may be turned, pinions mounted upon said shaft, rack-bars engaging said pinions and suitable connections between the rack-bars and the spools whereby the spools may be shifted.

8. In a type-writing machine, the combination with the ribbon-spools and their shafts, of means for shifting said ribbon-spools lengthwise comprising a shifter for each of

said ribbon-spools, the upper end of each of
said shifters extending above the ribbon-
spool and forming a guide for the ribbon, a
slide-bar located below each ribbon-spool and
5 to which the lower end of the corresponding
shifter is connected, a rack-bar on each side
of the machine for operating the correspond-
ing slide-bar and a shaft extending from side
to side of the machine, said shaft being pro-
10 vided with pinions to engage said rack-bars
and having one end extending outside the
machine-frame and provided with means
whereby said shaft may be manipulated.

9. In a type-writing machine, the combina-
15 tion with spool-shafts and spools, of means for

shifting the spools lengthwise comprising an
operating-shaft extending from side to side
of the machine, one end of said shaft being
provided with means whereby said shaft may
be turned, a check-wheel mounted upon said 20
shaft, a pawl for engaging said check-wheel,
individual shifters engaging the spools, indi-
vidual slide-bars engaging said shifters and
rack-and-pinion connections between said
slide-bars and said shaft whereby said spools 25
may be shifted in unison.

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