

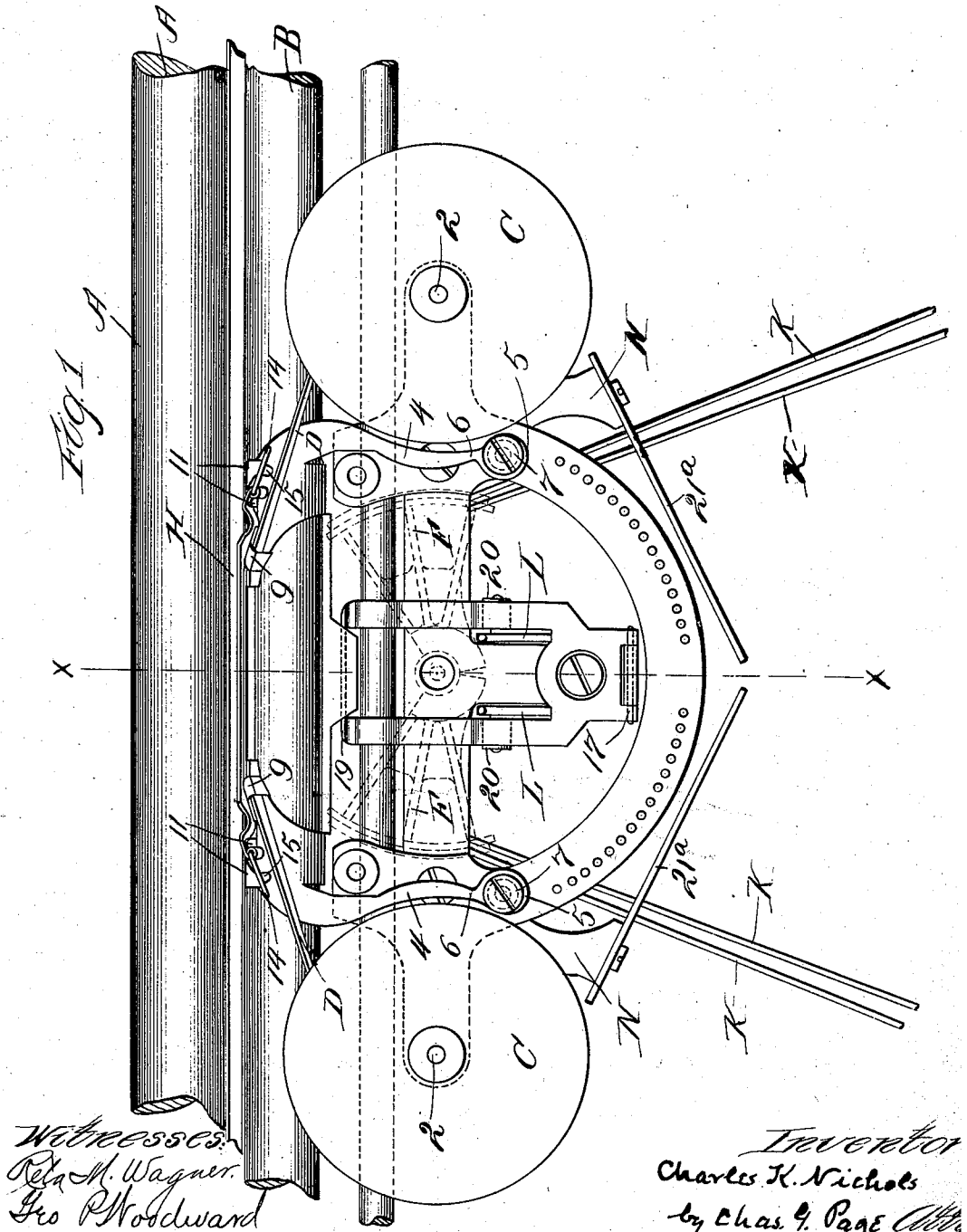
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3 Sheets—Sheet 1.

C. K. NICHOLS.
TYPE WRITING MACHINE.

No. 532,211.

Patented Jan. 8, 1895.



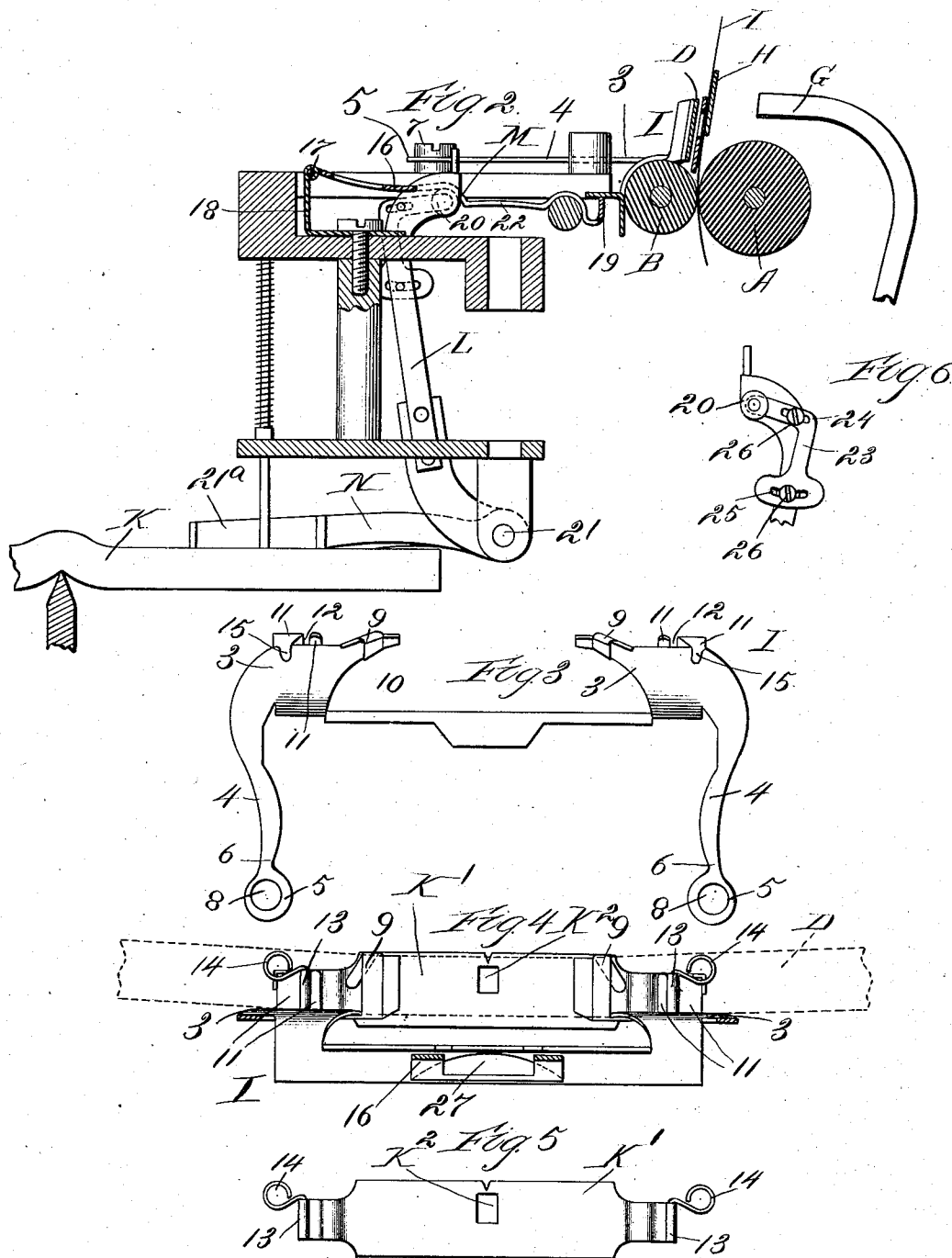
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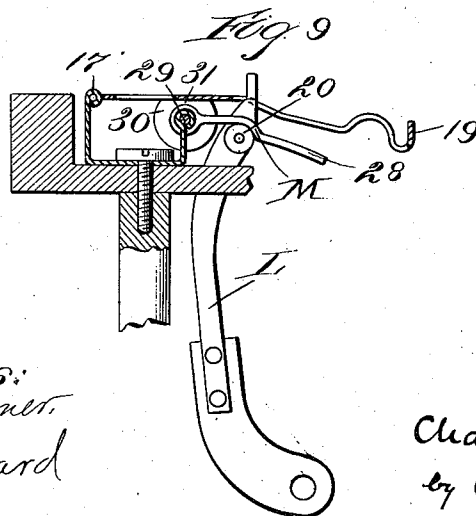
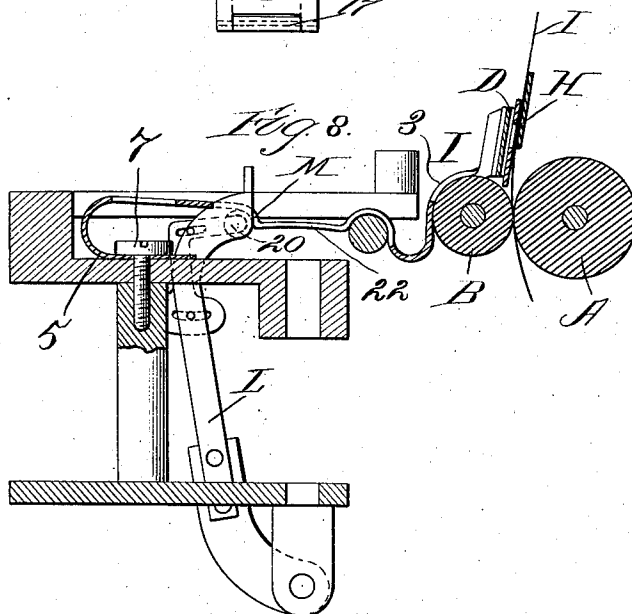
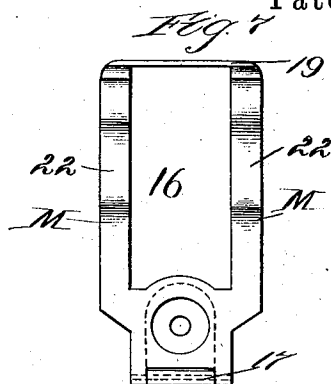
Witnesses:
Rita M. Wagner.
Geo. P. Woodward

Inventor:
Charles K. Nichols
by Chas. E. Page Atty.

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Inventor:
Charles K. Nichols
by Chas. G. Page *Atty.*

UNITED STATES PATENT OFFICE.

CHARLES K. NICHOLS, OF CHICAGO, ILLINOIS, ASSIGNOR TO JOHN SPENCER,
OF SAME PLACE.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 532,211, dated January 8, 1895.

Application filed December 26, 1893. Serial No. 494,704: (No model.)

To all whom it may concern:

Be it known that I, CHARLES K. NICHOLS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Type-Writing Machines, of which the following is a specification.

In a type-writing machine characterized by my invention, the ribbon-guide is normally depressed so as to expose the line, and is movable from such normal position so as to bring the ribbon in co-operative relationship with the impression devices. The ribbon-guide is operated from the key-levers, and in order to adapt it for machines in which variable actions are derived from the depressions of the keys so as to produce variable extents of rotation on the part of a type-wheel or segment, the ribbon-guide is operated by a cam movement timed to maintain the same in a determinate position with relation to the impression devices, as long as may be necessary for making the impression, and regardless of the extent to which the cam-movement may be operated. In this way, regardless of the variable actions resulting from the depressions of the keys, the ribbon will at each stroke or impulse, be brought into a determinate or uniform position relatively to the printing devices. As a means for raising the ribbon-guide from its normally depressed position, it is raised by the action of a movable member of the machine against an incline comprised in said cam-movement, the arrangement being such that when the incline is raised, a rise on the part of the ribbon-guide will take place. Various details constituting matters of further improvement are hereinafter set forth.

In the accompanying drawings—Figure 1 is a top plan view of a portion of a type-writing machine embodying my invention. Fig. 2 is a section on line $x-x$ in Fig. 1. Fig. 3 is a top plan of the ribbon-guide. Fig. 4 is a section taken transversely through the ribbon-guide and cam plate in rear of the paper-shield. Fig. 5 shows the paper-shield detached. Fig. 6 shows the upper end of one of the vibratory levers with the adjustable plate thereon. Fig. 7 is a top plan view of the cam-plate. Fig. 8 is a view similar to Fig. 2 but showing the cam-incline directly on the rib-

bon-guide. Fig. 9 is a sectional detail generally similar to Fig. 8 but showing another arrangement of cam lifting action.

In the construction of machine illustrated in said drawings, the paper-feeding rolls A and B are understood to be suitably mounted upon the carriage of a type-writing machine, and to be suitably operated when it becomes desirable to feed upwardly the paper 1. The ribbon-spools C are arranged to turn about vertical axes, and to such end are secured upon vertical spindles 2 which are understood to be operated by any ordinary or suitable step-by-step movement for the purpose of feeding forward the ribbon D, as usual.

The rotary, reciprocating type-segments F, can be operated as in the "Hammond" machine or any other suitable way, and hence are simply illustrated in dotted lines, it being deemed a sufficient explanation of such devices to state that when an impression is to be made, one or the other of these segments is swung in front of the ribbon to an extent to bring the required character thereon in front of the ribbon and in co-operative relationship with a vibratory platen or hammer G.

The strip H, illustrated, is a flexible pad strip which is carried by the carriage and arranged to back the paper. The platen or hammer is arranged in rear of the pad-strip, so that when a blow is struck, the ribbon, paper and pad-strip will be compacted between the hammer and type.

The ribbon-guide I, is adapted for both guiding and raising and lowering the portion of the ribbon, which extends between the spools. This ribbon-guide is normally lowered so as to normally expose and indicate the line, and is raised with the action of each of the several key-levers K so as to bring the ribbon in co-operative relationship with the type. The ribbon-guide normally rests upon the front feed-roll B, and to such end it is preferably formed with portions 3 which are curved in conformity with the roll. This arrangement also permits the ribbon-guide to uniformly repose in a defined or true position, so that when it is raised, it will always rise from such position and thus facilitate true or accurate action. In order to insure the drop or depression of the ribbon-guide, it is

subject to spring action, and as a simple and efficient arrangement, it is provided with spring-arms 4 which are secured at their ends 5 upon the main-frame of the machine. With such arrangement the ribbon-guide is attached to the main-frame of the machine by spring lever arms which oppose the rise of the guide with an elastic resistance. In order to lengthen the leverage between the free end of the guide which engages the ribbon, and the points whereat it is held upon the main-frame, its arms should have the greatest resilience near the said points. This can be attained in any suitable way, for example, by contracting the arms in width as at points 6 (Fig. 3). While therefore the rise and fall of the ribbon-guide will, strictly considered, be a vibratory movement, its free end portion will vibrate in the arc of a circle so large as to render the movement of such portion of the guide, proximately in a vertical plane. The ribbon-guide is also adjustably held upon the main-frame so that it can be set with all desired accuracy, and to such end its spring arms are secured by screws 7 which pass through holes 8 formed in the arms and made somewhat larger than the screw-stems, in which way, while the heads of the screws can clamp the ends of the arms upon the main-frame or some suitable fixture thereon, an adjustment of the ribbon-guide can be made by loosening the screws. As a means for engaging and guiding the ribbon, the said ribbon-guide is provided at its free end with hook-shaped lips 9 (Figs. 3 and 4) which embrace the upper edge portion of the ribbon. These guide-lips 9 are separated by a gap 10 (Fig. 3) in the plate of which the ribbon-guide is formed, thereby insuring parallelism between a suitable extent of ribbon and also leaving suitable space for the impression devices.

The ribbon-guide can of course be made of as many pieces as may be desired, although as a simplified and economical construction, it can be made from a single sheet-metal plate. The ribbon-guide is also provided with a paper-shield K' having an opening K² with which the character to be printed will be brought into register. The paper shield intervenes between the ribbon and the paper, and hence while having an opening of sufficient area to allow co-operative action between the type and hammer when the latter forces the intervening pad-strip, paper and ribbon as a whole against a character on the type-wheel or segment, it will permit such action only at the proper point and otherwise shield the paper from the portion of the ribbon opposite any adjacent characters. The upper edge of the paper-shield also provides a line indicator, and to such end the paper-shield is adapted in height with reference to the line. The paper shield is also removably held upon the ribbon guide, so that whenever necessary, it can be removed therefrom. As a means for thus detachably securing the shield upon the

ribbon-guide, the latter has its free end formed or provided with upturned flanges 11, each having a vertical slot 12 (Fig. 3). The paper shield, consisting of an oblong plate, has its ends adapted to form hooks for engaging in slots 12 of the flanges 11 on the ribbon-guide, and as a simple arrangement for locking the paper-shield in place, its end portions which are extended through and out from said slots are bent to form pintle sockets 13 (Fig. 4) for the pintle-portions of swinging latches 14. With such arrangement the pintle sockets can be of greater diameter than the width of the slots so that the paper shield can only be removed by raising it from the ribbon-guide, and by providing flanges 11 with catch lips 15 under which the latches can be caught, the paper shield can be locked down and held against removal until the latches are freed from their allotted catches.

The ribbon-guide is raised from its normal position by a cam-movement which is timed for raising the ribbon-guide to a proper extent. The cam-movement embodied in Figs. 1 and 2 comprises a vibratory arm or lever L arranged to act against a cam incline M which is combined or associated with the ribbon-guide, the plate or member which forms the incline being made separate from but in bearing contact with the ribbon-guide in said two figures, while in Fig. 8 the ribbon-guide is directly formed or provided with said incline. With reference first to Figs. 1, 2, and 6, a plate 16 is provided with the incline M and is hinged at 17 upon a supporting bracket 18 which is in turn secured upon the main-frame of the machine.

The upper free end of the lever L is normally in juxtaposition to the upper portion of the cam-incline M, and the ribbon-guide normally bears upon the forward free end portion 19 of the cam plate 16. When therefore the lever is swung forward it will act against the incline and lift the cam-plate, which latter in rising will lift the ribbon guide. The free end of the lever preferably acts against the cam-plate through the medium of an anti-friction roll 20 which is carried by the lever and shown in dotted lines in Fig. 2. The lever L is employed in the construction of machine shown, for actuating one of the type-bearing segments, and hence said lever is understood to be duplicated, so that each type-bearing segment can have its own actuating lever. Under such system, some of the letter-key levers K serve to operate one of the levers L while others serve to operate the remaining one of said levers L as illustrated in Fig. 1, wherein a few only of the letter-key levers are shown, those at the right serving to operate lever L at the right, and those at the left serving to operate lever L at the left. As a means for thus actuating levers L from the letter-key levers, the levers L are secured upon separate rock-shafts, whereof one rock-shaft 21 is shown in end view in Fig. 2, and upon said rock-shafts are arms N having lat-

erally extending portions 21^a which normally rest upon the letter key levers K. In machines of such class, the throw or actions of the levers L or other devices employed for operating a type-wheel or type-bearing segments are variable, as is well understood, for the purpose of permitting different actions to bring different type into position for printing, and hence, where levers L are employed, the depressions of the type-keys will cause one or the other of said levers to have different degrees of swing or throw. As a means therefore for compensating for such varying degrees of throw on the part of levers L, the cam comprising incline M, further comprises a horizontal or proximately horizontal portion 22 which is desirably curved or formed on the arc of a circle about an axis through the rock-shafts or spindles whereon the levers L are arranged. By such arrangement, forward swing on the part of either lever L will raise the ribbon-guide to a predetermined, uniform height, no matter to what extent the lever may be swung. Thus, the initial forward swing on the part of the lever causes the latter to act against the cam incline and raise the ribbon-guide to the required height. Further forward swing on the part of the lever will not however further lift the ribbon-guide, since as soon as the lever passes the lowest point of the incline, the portion 22 of the cam-plate will rest upon the lever, while the latter in moving in an arc corresponding with the curvature of the plate, will simply maintain the plate and ribbon-guide resting upon the plate, at the height attained by the action of the lever against the lowest portion of cam-incline M.

The cam-plate 16 can be forked as shown, and in such case each prong or arm portion can have an incline portion M and curved portion 22, the principle of construction being however the same as a single incline and curved portion for the two levers.

The anti-friction rolls are adjustable upon the levers so as to permit accurate adjustment, and to such end each lever carries a plate 23, (see Fig. 6) which is adjustable on the lever and adapted to support one of the rolls. For example the plate 23 may have slots 24 and 25 and be secured to its allotted lever by set screws 26 arranged to pass through such slots.

Where the cam-plate 16 is made separate from the ribbon-guide, it is preferably provided with an upturned end-portion 27 which is rounded as in Fig. 4 and arranged to engage the under side of the ribbon-guide. By such arrangement, should the action of either lever L cause any side tilt on the part of plate 16, such motion will not be communicated to the ribbon-guide, since the latter rests upon a rounded bearing which allows the plate to tilt or rock sidewise, independently of the ribbon-guide.

The cam-plate 16 normally rests upon a bar 28 on the main-frame, and is lifted therefrom by one or the other of the two levers L as hereinbefore explained.

While I prefer forming the cam portions M and 22 on a plate which is separate from the ribbon-guide and also separately hinged, particularly for the purpose of preventing side tilt or wobble on the part of the ribbon-guide, as aforesaid, it is understood that I can form or directly provide the ribbon-guide with such cam as in Fig. 7 wherein the ribbon-guide is shown formed with such cam portions M, 22.

In Fig. 9 the arrangement shown is practically an inversion of the cam arrangement hereinbefore described, but serves to attain the same end, and involves a principle common to both. In said Fig. 9, the anti-friction roll 20 on lever L acts against an incline M formed on a vibratory arm 28. Said arm 28 is fixed on a spindle 29 to which in turn is fixed a cam disk 30, arranged to engage the under side of the ribbon guide. When the lever L is in its normal position, the ribbon-guide rests upon the flat or straight portion 31 of the cam disk. When the lever is swung forward it will act against incline M and swing arm 28 upwardly. This up-swing on the part of arm 28 will turn the cam disk, and the latter will while thus turning, lift the ribbon guide until its cylindric or circular portion bears against the same, and hence further rotation on the part of the disk will cease to lift the ribbon-guide, since the latter will then be resting upon the circular portion of the disk.

The arrangement of Fig. 9, like that in preceding figures, involves the cam-incline M in conjunction with the ribbon-guide, and both of such arrangements involve a cam-movement timed for raising the ribbon-guide to some determinate or uniform height and positively maintaining it in such position during any such action or motion as may be in excess of that requisite to bring it to such height.

What I claim as my invention is—

1. In a type-writing machine, the combination of a movable ribbon-guide, a cam-device coacting directly with the ribbon-guide and comprising a cam incline M, and a cam portion 22 extending from the lower portion of the incline, and a vibratory arm operated from the key-levers and arranged for action against the cam engine, substantially as and for the purpose described.

2. In a type-writing machine, the combination of a movable ribbon-guide, a movable cam plate coacting directly with the ribbon-guide and having an incline and a movable member operated from the key-levers and arranged for action against said incline so as to raise the cam-plate and ribbon-guide, substantially as described.

3. In a type-writing machine, the combination of a movable ribbon-guide, a hinged cam-

plate coacting directly therewith and having an incline and a vibratory lever arranged for action against said incline for raising the ribbon-guide, substantially as and for the purpose described.

4. In a type-writing machine, the combination of a movable ribbon-guide and a vibratory plate arranged for raising the ribbon-guide and having a rounded bearing portion 27 which engages the side ribbon-guide, whereby to cause the latter to move in a right line irrespective of the position assumed by the said plate substantially as and for the purpose described.

5. In a type-writing machine, means for exposing the line comprising a movable ribbon-guide, a cam incline M movable with the ribbon-guide and having at its lower end a forwardly extending portion 22, and a vibratory lever having an anti-friction roll arranged to traverse said incline and forwardly extending portion 22, substantially as described.

6. In a type-writing machine comprising a rotary type-wheel or segment, the combination with a vibratory lever for operating the type-wheel or segment, of a movable ribbon-guide and a cam incline normally in path of said lever and arranged substantially as set forth for raising the ribbon-guide.

7. In a type-writing machine, the combination with a movable ribbon-guide, of a vibratory lever for raising the type-ribbon guide and carrying an anti-friction roll for the purpose set forth, and a holder for said roll adjustably held upon the lever.

8. In a type-writing machine, a reciprocating ribbon guide provided with spring arms by which it is held upon the machine, said guide operating independently of the ribbon-spools substantially as set forth.

9. In a type-writing machine, a reciprocating ribbon-guide provided with hook-portions 9, separated from one another by a gap 10 and serving to engage the ribbon, and having resilient arms 4 adapted to be secured to a rigid portion of the machine substantially as set forth.

10. In a type-writing machine a movable ribbon-guide provided with a removable paper shield K', and means for temporarily locking said shield in place, substantially as described.

11. In a type-writing machine, the ribbon-guide provided with ribbon engaging portions 9, and slotted flanges 11, and a paper-shield removably held upon the ribbon-guide, substantially as described.

12. The combination with the ribbon-guide having slotted flanges 11, of the removable paper-shield K' having pintle sockets 13 and catches 14, substantially as set forth.

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