

No. 864,601.

PATENTED AUG. 27, 1907.

G. C. BLICKENSDECKER.

CARRIAGE FEEDING AND CONTROLLING DEVICE.

APPLICATION FILED NOV. 16, 1903.

2 SHEETS—SHEET 1.



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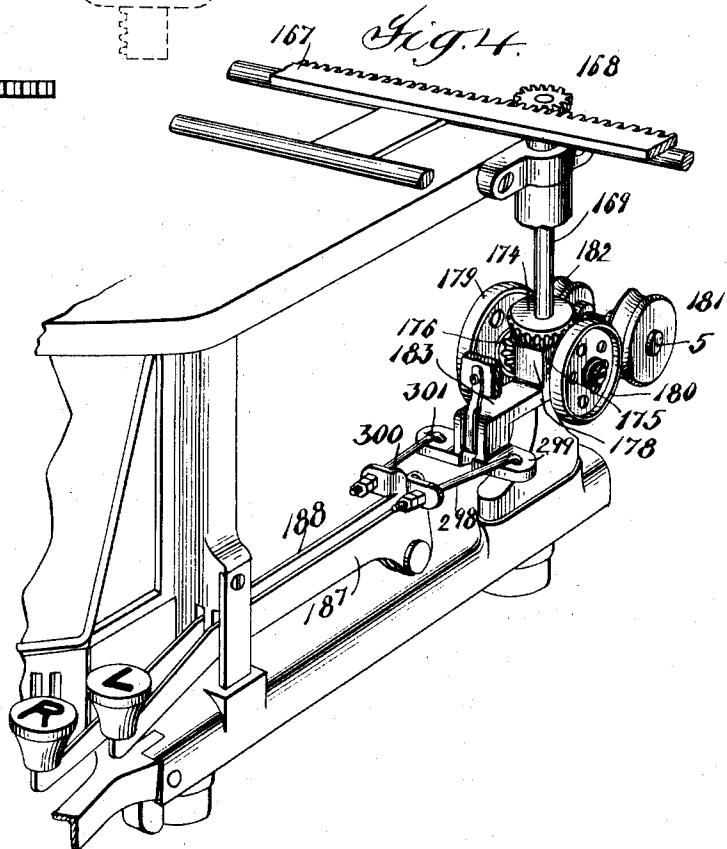
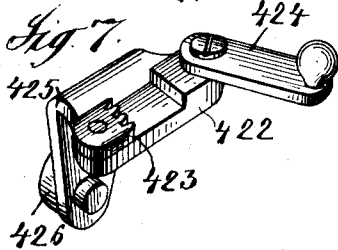
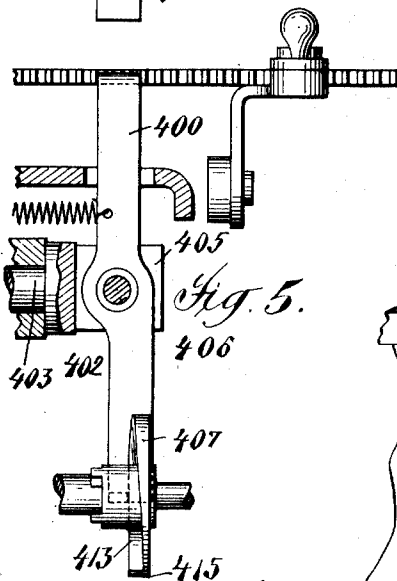
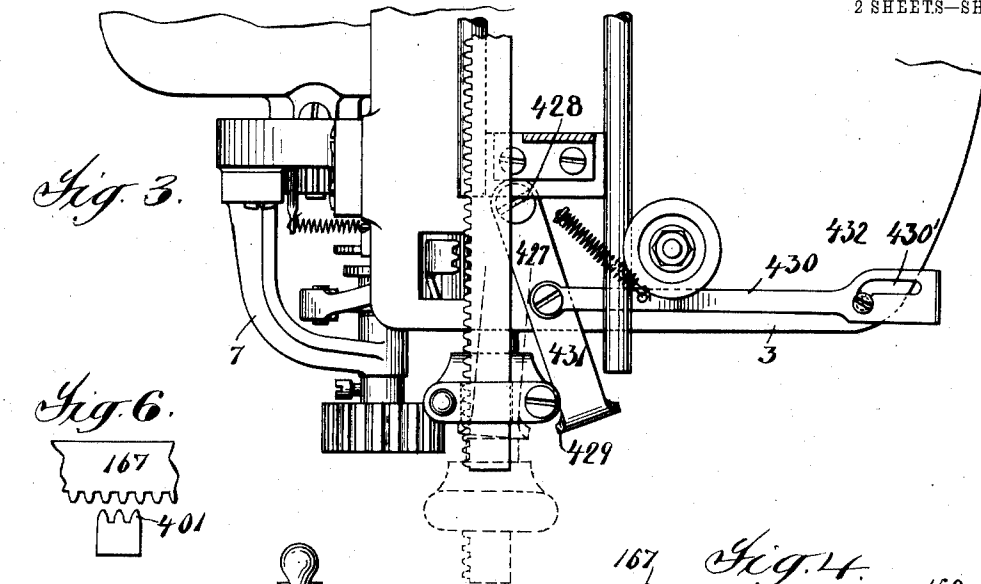
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2 SHEETS—SHEET 2.

Fig. 3.

Fig. 6.



Attest:
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by Philipp Saurin, Rice & Kennedy
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UNITED STATES PATENT OFFICE.

GEORGE C. BLICKENSDERFER, OF STAMFORD, CONNECTICUT.

CARRIAGE FEEDING AND CONTROLLING DEVICE.

No. 864,601.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed November 16, 1903. Serial No. 181,265.

To all whom it may concern:

Be it known that I, GEORGE C. BLICKENSDERFER, a citizen of the United States, residing at Stamford, county of Fairfield, and State of Connecticut, have invented certain new and useful Improvements in Carriage Feeding and Controlling Devices, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in carriage feeding and controlling mechanism for typewriting machines.

In typewriting machines, and particularly in those in which the various movements are produced by the power mechanism, it is necessary, because of the rapidity with which the type mechanism operates, that the feeding movements of the carriage be also effected with great rapidity. And it is furthermore desirable that the feeding movements be absolutely positive in order that the carriage may position the paper with absolute accuracy to receive the impressions from the type mechanism. It is also desirable, particularly in power operated machines, and especially those in which the carriage is returned by power operated devices, that the carriage be free or disconnected from the feeding mechanism, except at the time when the feeding movement is occurring, so that the position of the carriage may be readily shifted without throwing the feeding mechanism out of operative relation therewith, and at the same time it is desirable that when the feeding mechanism has engaged the carriage, in order to produce the feeding movement, it shall retain it under absolute control, so that the carriage may be moved and positively stopped with absolute precision, thus enabling the impressions of the type mechanism to be properly positioned on the paper, and at the same time from preventing any fault in the impression, due to a quivering movement of the carriage, or to over-feeding or rebound.

In an application filed by me on December 6, 1902; Serial No. 134,144, there is described and claimed a feeding mechanism for typewriting machines, comprising suitable engaging devices, and in which the carriage is free to move, except when under the control of the feed mechanism, the feeding mechanism operating in connection with suitable cooperating means to bring the carriage to a positive stop. In that mechanism, however, a checking or holding pawl is employed to prevent any movement of the carriage during the return of the feeding member, the holding pawl being thrown out, however, as soon as the feeding member completes its movement. The employment of such holding pawls, however, and the mechanism for operating them increases the cost of the machine and renders its mechanism more complicated.

One of the objects of the present invention is to provide an improved feeding mechanism for typewriting machines which while particularly adapted for power

operated machines may be useful in machines other than those operated by power, and which shall be simple, cheap to construct, and which shall be effective and positive in its operation.

A further object of the invention is to produce an improved feeding mechanism for typewriting machines, which while particularly adapted for power operated machines may be useful in machines other than those operated by power, which will produce a positive feeding movement of the carriage, and in which the length of feeding movement shall be positively determined, the carriage being free of the feeding mechanism except when the feeding movement is occurring and in which the use of checking or holding pawls or similar devices is unnecessary.

With these and other objects in view, the invention consists in certain constructions, and in certain parts, improvements, and combinations as will be hereinafter described and then more particularly pointed out in the claims hereunto appended.

Referring to the drawings in which like characters of reference indicate the same parts,—Figure 1 illustrates, in side elevation and partly in section, one form of a typewriting machine embodying the invention; Fig. 2 is a rear elevation, partly in section, of so much of the construction illustrated in Fig. 1 as is necessary to understanding the invention, the position of the observer being indicated by the arrow 2 in Fig. 1; Fig. 3 is a plan view, partly in section, of a part of the construction illustrated in Fig. 2; Fig. 4 is a detailed perspective view of the carriage returning mechanism, this mechanism being located on the opposite side of the machine to that illustrated in Fig. 1; Figs. 5, 6 and 7 are detail views.

The machine which has been selected to illustrate the invention is a power driven wheel machine of the well known Blickensderfer type. It is to be understood, however, that the invention is not confined to power driven machines nor to wheel machines, and that it may be embodied in constructions which differ widely from the particular one illustrated in the drawings.

Referring to the drawings which illustrate one embodiment of the invention, the frame in which the parts are mounted may be of any suitable form and constructed in any suitable manner. As shown, the frame embodies a base plate 1, mounted on suitable feet 2, and a top plate 3 which is supported above the base in any suitable manner.

When the invention is embodied in a power driven machine, the means by which the power is applied for operating the machine may be of any suitable description. Preferably, however, it will be similar to the means disclosed in the patent granted to George C. Blickensderfer, No. 717,732, dated January 6, 1903. In the preferred form of the construction, and as shown, the power mechanism comprises a constantly running

power shaft 5, provided with a driving gear or pinion 6, said gear or pinion meshing with a gear 10, mounted on a short shaft 9, suitably supported in the machine frame and in a bracket 7 extending therefrom.

- 5 In the construction shown, the mechanism through which the power mechanism produces the various movements incident to the printing operations, is normally stationary and is thrown into and out of operative relation with the power mechanism at the proper time.
- 10 To effect this in the machine shown, the gear 10 is secured to a toothed plate 11 which forms one of the parts of a clutch, the cooperating member of the clutch consisting of a toothed plate 15, mounted on a hub through which the shaft 9 passes, the hub being loose on the
- 15 shaft. When the clutch is engaged it serves to operate the various parts of the mechanism, the operations, so far as are necessary to the understanding of the present invention, being more specifically hereinafter referred to.
- 20 The engagement of the clutch members is controlled by means of a pivoted controller lever 25, carrying a cam which serves to operate the clutch members when the lever is in one position, said cam being inoperative when the lever is in another position, at which time a
- 25 suitable spring 16 forces the members of the clutch into engagement.

- The controller lever is operated by means of a slide bar 29, having a hooked end 30 which has in turn a recess 31, said recess engaging with an extension 32 on
- 30 the controller lever, the slide bar having a spring 33 secured thereto which serves at the proper times to move it toward the clutch. The construction is such that the slide bar is disengaged from the controller as soon as the members of the clutch are engaged, and the
- 35 controller, therefore moves into position so as to separate the parts of the clutch as soon as the shaft 9 has completed a revolution.

- The operations of the type mechanism are effected by means of a driver which, as shown, consists of a cam 18, connected to the toothed plate 15 in such a way that the
- 40 plate may be moved to disengage the parts of the clutch without disengaging it from the driver. This driver operates the actuating mechanism of the machine through a slide bar 45, the said bar being connected to
- 45 an arm 51 extending upwards from the shaft 50, supported in the frame of the machine, this shaft 50 serving, through suitable connections, not necessary to describe to operate the type mechanism, herein indicated by a wheel.

- 50 The disengagement of the slide bar 29, before referred to, from the controller lever, is effected by means of a cam 35 which is connected to the driver 18, and which operates on an extension of the slide bar. The mechanism hereinbefore briefly referred to, is fully described
- 55 in the patent referred to, and reference is made to said patent for a detailed description and disclosure thereof.

- The carriage feeding mechanism will be of such a character that the carriage is absolutely under the control of the feed devices at the time when it is being
- 60 moved, but is free to be moved in either direction at other times. The construction by which the carriage is fed and at the same time is left free to move in either direction when it is not being fed, may be widely varied, and will be varied according to the type of the machine
- 65 and the particular feeding mechanism employed. In

the construction illustrated, the carriage may be given a step by step advancing movement, and also may be given a continuous movement in either direction, these movements being effected by proper connections to the power mechanism, but the carriage is also free to be moved in any other manner, as, for instance, by the hand of the operator, when it is not under the control of the mechanism which gives it the step by step movement or the continuous movement.

The mechanism for giving the carriage the continuous movement may be of any suitable description. As shown, the carriage is provided with a rack 167 which is engaged by a pinion 168, mounted on a vertical shaft 169, the pinion being in continuous engagement with the rack. The shaft 169 is provided with a gear wheel 174 which is in mesh with two gears 175 and 176, said shaft being loosely mounted in the support or block 178. This block 178 is mounted so as to receive a pivotal movement by means hereinafter described. The gear 176 has secured to it a friction wheel 179, and the gear 175 has secured to it a friction wheel 180, this wheel 180 preferably being of less diameter than the wheel 179. These wheels 179 and 180 are arranged so that they can be driven from the power mechanism, and to this end the power shaft 5, before referred to, is provided with friction driving wheels 181 and 182, the wheel 181 being located so that it may be engaged by the wheel 180, and the wheel 182 so that it may be engaged by the wheel 179, the engagement between these pairs of wheels being effected by giving the supporting block 178 a swinging movement. In the construction shown, this swinging movement is effected by two key levers 187 and 188, suitably pivoted in the frame, the key lever 187 being connected by means of a short tie-rod 298 to an annular extension 299 of a projecting portion 183 of the block 178. Similarly the lever 188 is connected by a short tie-rod 300 to an extension 301 of the projecting portion 183 of the block. By depressing either key lever, the block 178 will be given an angular movement, and either the wheel 179 or the wheel 180 will be thrown into engagement with the wheel 181 or the wheel 182, and the shaft 169 will be rotated in either one direction or the other, as the case may be, to move the carriage. This mechanism for giving the carriage the continuous movement is fully described and the features of this mechanism and the combination of it with a step by step advancing mechanism are claimed in the application before referred to. The step by step advancing or feeding movement of the carriage may be effected by widely differing constructions. In the construction shown, a feeding member is employed which is normally out of feeding relation with the carriage, but which is given at the proper times a positioning movement or a movement which carries it into feeding position, the member being thereafter given the feeding movement to effect the advance of the carriage one step.

The carriage will preferably be provided with a feeding device which cooperates with the feeding member and which may be of any suitable construction. As shown this feeding device consists of the rack 167, before referred to. The form and construction of the feeding member may be varied within wide limits, as may the construction by which it is mounted and operated. Preferably, however, it will be constructed

to positively engage the carriage. In the construction illustrated this feeding member consists of a pawl or lever 400, and when the carriage with which the lever coöperates is provided, as in the construction shown, with a rack, the lever will preferably be provided with engaging teeth 401 which mesh with the teeth of the rack. In the construction shown, the upper end of the lever is given an angular bend, and this form, while not necessary to the successful operation of the device, is the preferred form.

As has been indicated, the means for supporting the lever may be widely varied, but in the preferred construction, and as shown, the lever will be mounted on a movable support which, in the preferred construction, will consist of a rocking block 402, this block being secured to a stud 403, suitably mounted in a boss 404 extending from the machine frame. As shown, the outer end of the stud is cleft to provide arms or jaws 405, these arms or jaws serving to support a pivot 406 on which the lever 400 swings. In the operation of the specific mechanism, the rocking block is moved to properly position the lever in engaging feeding relation with the carriage, after which the lever is given a swinging movement on its pivot to advance the carriage.

The means by which the lever or pawl support is given its movement may be widely varied, and will be varied according to the specific construction in which the invention is embodied. In the particular construction shown, there is provided a cam 407, this cam being mounted on a sleeve 408, the said sleeve being fast to the driver 18, before referred to, as supported on the short shaft 9. This cam is provided with a notch 409, as is clearly indicated in Fig. 1, the remaining part of the cam being concentric. The block 402 has secured to it by means of a screw, or in any other manner, an arm 410, said arm carrying at its outer end the usual antifriction roll 411, said roll being arranged to run on the circumference of the cam. In the preferred construction this arm 410 will be a stiff spring arm which will operate to insure a positive engagement of the pawl or lever with the rack on the carriage and at the same time provide for wear and for slight variations in the construction. When, through the operation of the mechanism hereinbefore referred to, the parts of the clutch 11, 15 are thrown into engagement, the sleeve 408 revolves and the cam 407 makes a revolution. As the cam roll 411 passes out of the notch 409, the block 402 is rocked and the feeding member or lever 400 is positioned in engagement with the rack and is firmly held and locked there, the antifriction roller running on the circumference of the concentric portion of the cam. When the cam has completed its revolution and the notch 409 comes opposite the roller 411, the roller drops into the notch, this movement being preferably assisted by means of a spring 412, suitably connected to the frame of the machine and to an arm 412' fast on the stud 403, the arm and spring being shown in dotted lines in Fig. 1. While this arm and spring constitute a desirable adjunct in insuring the return movement of the block, they may be omitted if desired, or other means may be substituted for them.

The means by which the feeding member is given the feeding or advancing movement may be widely varied. In the construction shown, however, the cam 407 is provided with an operating face 413 located on

its side, and the lever 400 is provided with a short inwardly projecting arm 414 which runs on a side face 413 of the cam. This side face is preferably given a gradual rise, the cam face extending nearly around the circumference of the cam, but as shown in Figs. 1 and 5, it begins a little distance beyond one side of the notch 409 and terminates in an abrupt shoulder 415, a little distance from the other side of the notch. In this construction it will be seen that as the cam 407 revolves as soon as the antifriction roller 411 has passed out of the notch, at which time the lever 400 has been caused to engage with the rack on the carriage the feeding movement of the carriage begins, due to the action of the cam face 413 on the extension 414 of the lever. When the extension 414 reaches the shoulder 415, the feeding movement has been completed and the carriage comes to a stop. The extension of the lever then drops off the shoulder 415, this movement being, in the construction shown, insured by the action of a spring 416 secured to the lever and to a stud 417 fast on the machine frame. While the use of this spring 416 is desirable for insuring the quick and positive action of the parts, it might, under some circumstances, be omitted, or other means might be substituted therefor.

Means will preferably be provided for definitely limiting the forward feeding or advancing movement of the feeding member, and preferably these means will coöperate with the step by step advancing agencies to positively lock the carriage at the time when the feeding movement is completed, so as to prevent any rebound, over-feeding, or quivering of the carriage. While these means may be variously constructed, this result may be simply and efficiently accomplished by means of a stop against which the feeding member or lever strikes just as its forward movement is completed. In the construction shown, this stop consists of a screw 418 tapped into the edge of the top plate 3, the lever abutting against the inner end of the screw. By adjusting the screw which is or may be provided with a suitable lock nut 419, the forward movement of the lever is positively limited or determined and caused to be coincident with the end of the rise of the cam. It will be understood that at the end of the feeding movement the lever is positively held between the stop and the cam and locked against movement in either direction, and at the same time is positively held locked to the carriage rack by means of the spring arm and the concentric portion of the cam 407. There can, therefore, be no rebound or over-feeding of the carriage, and by reason of the locking action of the parts, any shake or quiver of the carriage is prevented, these results being highly desirable, particularly in rapidly operating power driven machines, though useful in machines of other types. Furthermore it will be seen that there is no necessity with a feeding mechanism of this character for employing the checking or holding pawls heretofore used. The feeding mechanism brings the carriage to an absolute stop and is then disengaged, after which the inertia of the carriage may be depended upon to keep the carriage stationary, the movement of any of the parts having no tendency to in any way produce any movement of the carriage. Furthermore it is also apparent that in the specific construction the various devices for operating the feeding member make it what may be termed a four-motion

feed. That is to say, the feeding member has a motion toward the rack to engage therewith; a motion parallel with the movement of the rack and carriage to feed the carriage; a motion away from the rack when it is disengaged therefrom, and a returning motion.

When the carriage is returned after a complete line has been printed, whether by means of the power operated device, before referred to, or by hand, it is desirable that the distance through which the carriage is returned be positively determined, in order that the margin on the sheet being printed may be uniform. In the construction shown, this is effected by means of a suitably arranged stop which is mounted on the carriage. While the construction of this stop may be varied, and its point of attachment to the carriage may be varied, it will be preferably mounted on the rack 167, before referred to. In the specific construction illustrated, this stop embodies a recessed block 422, the block being provided with a toothed portion 423, the teeth of which are arranged to engage the teeth of the rack. The recessed block is placed in position with its teeth engaging the teeth of the rack, and is then secured there by any suitable means. As shown, the securing means consist of a pivoted latch 424 which swings over the top of the rack. Extending from the block 422 is an angular arm 425, said arm being preferably provided with a cushion block 426 which is arranged to strike, in the normal operation of the device, the edge of the top plate 3.

It is frequently desirable in the operation of typewriting machines, to provide for a quick and predetermined change in the distance through which the carriage returns, as, for instance, when indenting or paragraphing. In the construction shown, this is effected by means of a second stop which is mounted on the frame and arranged to be moved into and out of operative relation with the stop before described. In the construction shown, this stop consists of an arm 427 pivoted to the plate 3 at 428 and provided with a downwardly bent portion 429. For convenience in swinging this stop into and out of operative position, there is provided a slide 430 which is pivoted at 431 to the arm 427 and, as shown, this arm has a bayonet slot 430' which engages with a pin 432, mounted on the top plate 3. When the parts are in the position shown in Fig. 3, the stop 427 is in its inoperative position and is locked there, the pin 432 engaging the angular portion of the bayonet slot. When it is desired to throw the stop 427 into operative position, the slide is moved sidewise slightly to disengage the pin from the angular portion of the slot, after which the slide is pushed in above the downwardly bent end of the arm 429 and is in position to be struck by the cushion block 426 of the adjustable stop on the rack.

The carriage embodies suitable side rods 435, 436 which work between suitable supporting pulleys 437 in a manner well understood, and it will also be understood that the carriage will also be provided with the usual platen 438, and will also have the other devices which are necessary or desirable to form a carriage for a typewriter, a description and illustration of these devices not being necessary to the illustration of the invention, and not being, therefore, incorporated in the present invention.

While the specific mechanism for carrying this inven-

tion into effect which has been hereinbefore described, constitutes the preferred embodiment of the invention, it will be understood that changes and variations may be made therein and that many other embodiments of the invention, differing widely from the one illustrated and described, are possible. The invention is not, therefore, to be limited to the specific construction hereinbefore described and illustrated in the accompanying drawings.

What is claimed is:—

1. In a typewriting machine, the combination with the carriage, of a feeding member, motor operated means for bringing it into feeding position and positively locking it to the carriage and for giving it a feeding movement while thus locked, substantially as described.

2. In a typewriting machine, the combination with the carriage having a feeding device, of a motor operated mechanism, a feeding member, means operated by the power mechanism for causing the feeding member to engage the feeding device on the carriage and for giving it a positive feeding movement, and means for definitely limiting the feeding movement, substantially as described.

3. In a typewriting machine, the combination with the carriage having a feeding device, of a motor operated mechanism, a feeding member, means operated by the power mechanism for causing the feeding member to engage the feeding device on the carriage and for giving it a positive feeding movement, and a stop for definitely limiting the feeding movement, substantially as described.

4. In a typewriting machine, the combination with the carriage, of a pivoted feeding member, means for moving the feeding member to bring it into feeding position, and means for swinging it on its pivot to give it the feeding movement, substantially as described.

5. In a typewriting machine, the combination with the carriage, of a pivoted feeding member, means for moving the feeding member to bring it into feeding position, means for swinging it on its pivot to give it the feeding movement, and means for definitely limiting the feeding movement, substantially as described.

6. In a typewriting machine, the combination with the carriage, of a pivoted feeding member, a motor operated mechanism, means for moving the member to bring it into feeding position, and means operated by said mechanism for giving it a movement about its pivot to effect the feeding movement, substantially as described.

7. In a typewriting machine, the combination with the carriage, of a pivoted feeding member, a motor operated mechanism, means for moving the member to bring it into feeding position, means operated by said mechanism for giving it a movement about its pivot to effect the feeding movement, and means for definitely limiting the feeding movement, substantially as described.

8. In a typewriting machine, the combination with the carriage, of a pivoted feeding member, a motor operated mechanism, means for moving the member to bring it into feeding position, means operated by said mechanism for giving it a movement about its pivot to effect the feeding movement, and a stop for definitely limiting the feeding movement, substantially as described.

9. In a typewriting machine, the combination with the carriage, of a support, a feeding member mounted in the support, means for giving the support a movement to bring the member into feeding position, and means for giving the member a movement with respect to the support to advance the carriage, substantially as described.

10. In a typewriting machine, the combination with the carriage, of a support, a feeding member mounted in the support, means for giving the support a movement to bring the member into feeding position, means for giving the member a movement with respect to the support to advance the carriage, and means for definitely limiting the advancing movement, substantially as described.

11. In a typewriting machine, the combination with a carriage having a feeding device thereon, of a support, a feeding member mounted in the support and arranged to positively engage the device on the carriage, means for giving the support a movement to bring the member into

- feeding engagement position, means for giving the member a movement with respect to the support to advance the carriage, and means for definitely limiting the advancing movement, substantially as described.
- 5 12. In a typewriting machine, the combination with a carriage having a feeding device, of a support, a feeding member pivoted in the support and arranged to positively engage the device on the carriage, means for giving the support a movement to bring the member into engaging position, means for giving the member a movement on its pivot to advance the carriage, and means for definitely limiting the advancing movement, substantially as described.
- 10 13. In a typewriting machine, the combination with the carriage, of a support, a feeding member mounted in the support, a power mechanism, means operated by the power mechanism for giving the support movement to bring the feeding member into feeding position and means operated by the power mechanism for giving the member a movement with respect to its support to feed the carriage, substantially as described.
- 15 14. In a typewriting machine, the combination with the carriage, of a support, a feeding member mounted in the support, a power mechanism, means operated by the power mechanism for giving the support movement to bring the feeding member into feeding position, means operated by the power mechanism for giving the member a movement to advance the carriage, and a stop for definitely limiting the advancing movement, substantially as described.
- 20 15. In a typewriting machine, the combination with a carriage, having a feeding device, of a support, a feeding member mounted in the support and arranged to positively engage the device on the carriage, a power mechanism, means operated by the power mechanism for giving the support movement to bring the feeding member into operative position, and means operated by the power mechanism for giving the said member a movement to advance the carriage, substantially as described.
- 25 16. In a typewriting machine, the combination with a carriage having a feeding device, of a support, a feeding member mounted in the support and arranged to positively engage the device on the carriage, a power mechanism, means operated by the power mechanism for giving the support movement to bring the feeding member into operative position, means operated by the power mechanism for giving said member a movement to advance the carriage, and a stop for definitely limiting the advancing movement, substantially as described.
- 30 17. In a typewriting machine, the combination with a carriage having a feeding device, of a support, a feeding member pivoted in the support and arranged to positively engage the device on the carriage, a power mechanism, means operated by the power mechanism for giving the support a movement to cause the feeding member to engage the device on the carriage, and means operated by the power mechanism for giving the member a movement to advance the carriage, substantially as described.
- 35 18. In a typewriting machine, the combination with a carriage having a feeding device, of a support, a feeding member pivoted in the support and arranged to positively engage the device on the carriage, a power mechanism, means operated by the power mechanism for giving the support a movement to cause the feeding member to engage the device on the carriage, means operated by the power mechanism for giving the member a movement to advance the carriage, and a stop for definitely limiting the advancing movement, substantially as described.
- 40 19. In a typewriting machine, the combination with the carriage, of a rocking support, a feeding member pivoted in the support, means for rocking the support to bring the feeding member into feeding position, and means for swinging the member about its pivot to effect the feeding movement, and means for definitely limiting the feeding movement, substantially as described.
- 45 20. In a typewriting machine, the combination with the carriage, of a rocking support, a feeding member pivoted in the support, a power mechanism, means operated by the power mechanism for rocking the support to bring the feeding member into feeding position, and means operated by the power mechanism for giving the feeding member a swinging movement about the pivot to effect the feeding movement, substantially as described.
- 50 21. In a typewriting machine, the combination with the carriage, of a rocking support, a feeding member pivoted in the support, a power mechanism, means operated by the power mechanism for rocking the support to bring the feeding member into feeding position, means actuated by the power mechanism for giving the feeding member a swinging movement about the pivot to effect the feeding movement, and means for definitely limiting the feeding movement, substantially as described.
- 55 22. In a typewriting machine, the combination with the carriage, of a feeding member, means for giving it a positioning movement, a power mechanism, a rotary cam for giving the feeding member a feeding movement, and means for returning the member, substantially as described.
- 60 23. In a typewriting machine, the combination with a carriage, of a feeding member, means for giving it a positioning movement, a power mechanism, a rotary cam for giving the member a feeding motion, means for returning the member, and a stop for definitely limiting the feeding movement, substantially as described.
- 65 24. In a typewriting machine, the combination with the carriage, of a feeding member, a power mechanism, and a rotary cam for bringing the feeding member into feeding position and for giving it its feeding movement, and means for returning the member, substantially as described.
- 70 25. In a typewriting machine, the combination with a carriage, of a feeding member, a power mechanism, a rotary cam for bringing the feeding member into feeding position and for giving it its feeding movement, and means for returning the member, substantially as described.
- 75 26. In a typewriting machine, the combination with the carriage, of a feeding member, a power mechanism, a rotary cam for bringing the feeding member into feeding position and for giving it its feeding movement, returning means for the member, and a stop for definitely limiting the feeding movement, substantially as described.
- 80 27. In a typewriting machine, the combination with the carriage, of a rocking support, a feeding member mounted in the support, a power mechanism, a rotary cam operated by the power mechanism, means whereby the cam rocks the support to bring the feeding member into feeding position, means for giving the feeding member feeding movement, and returning means for the member, substantially as described.
- 85 28. In a typewriting machine, the combination with the carriage, of a rocking support, a feeding member mounted in the support, a power mechanism, a rotary cam operated by the power mechanism, means whereby the cam rocks the support to bring the feeding member into feeding position, means for giving the feeding member feeding movement, returning means for the member, and a stop for definitely limiting the feeding movement, substantially as described.
- 90 29. In a typewriting machine, the combination with the carriage, of a rocking support, a feeding member pivoted in the support, a power mechanism, a rotary cam driven thereby, means whereby the cam operates the rocking support to bring the feeding member into feeding position and swings the member on its pivot to produce the feeding movement, and returning means for the member, substantially as described.
- 95 30. In a typewriting machine, the combination with the carriage, of a rocking support, a feeding member pivoted in the support, a power mechanism, a rotary cam driven thereby, means whereby the cam operates the rocking support to bring the feeding member into feeding position and swings the member on its pivot to produce the feeding movement, returning means, and means for definitely limiting the feeding movement, substantially as described.
- 100 31. In a typewriting machine, the combination with the carriage having an engaging device, of a rocking support, a stiff spring connected thereto, a power mechanism, a cam driven thereby and operating on the spring to give the support its rocking movement, a feeding member pivoted in the support and arranged to engage the device on the carriage, means for giving the member its feeding
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movement, and returning means, substantially as described.

32. In a typewriting machine, the combination with the carriage, having a rack, of a power mechanism, a rocking support, a feeding member pivoted in the support and having teeth to engage the rack, a stiff spring extending from the support, a rotary two-faced cam driven by the power mechanism, one of the faces of the cam operating to rock the support and the other face of the cam operating to swing the feeding member, and returning means substantially as described.

33. In a typewriting machine, the combination with the carriage having a rack, of a power mechanism, a rocking support, a feeding member pivoted in the support, a stiff spring extending from the support, a rotary two-faced cam driven by the power mechanism, one of the faces of the cam operating to rock the support and the other face of the cam operating to swing the feeding member, means for definitely limiting the feeding movement, and returning means, substantially as described.

34. In a typewriting machine, the combination with the

carriage having a rack, of a power mechanism, a rocking support, a feeding member pivoted in the support, a stiff spring extending from the support, a rotary two-faced cam driven by the power mechanism, one of the faces of the cam operating to rock the support and the other face of the cam operating to swing the feeding member, a stop for definitely limiting the feeding movement, and returning means, substantially as described.

35. In a typewriting machine, the combination with a carriage, of a motor driving mechanism, a four-motion feeding device arranged to give the carriage a step by step advancing movement, said device being arranged to be positively locked at the end of each advancing movement, and operating devices driven by the motor mechanism, substantially as described.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

GEORGE C. BLICKENSBERGER.

Witnesses:

W. H. KENNEDY,

J. A. GRAVES.