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G. G. GOING

TYPEWRITING MACHINE

Filed July 13, 1925

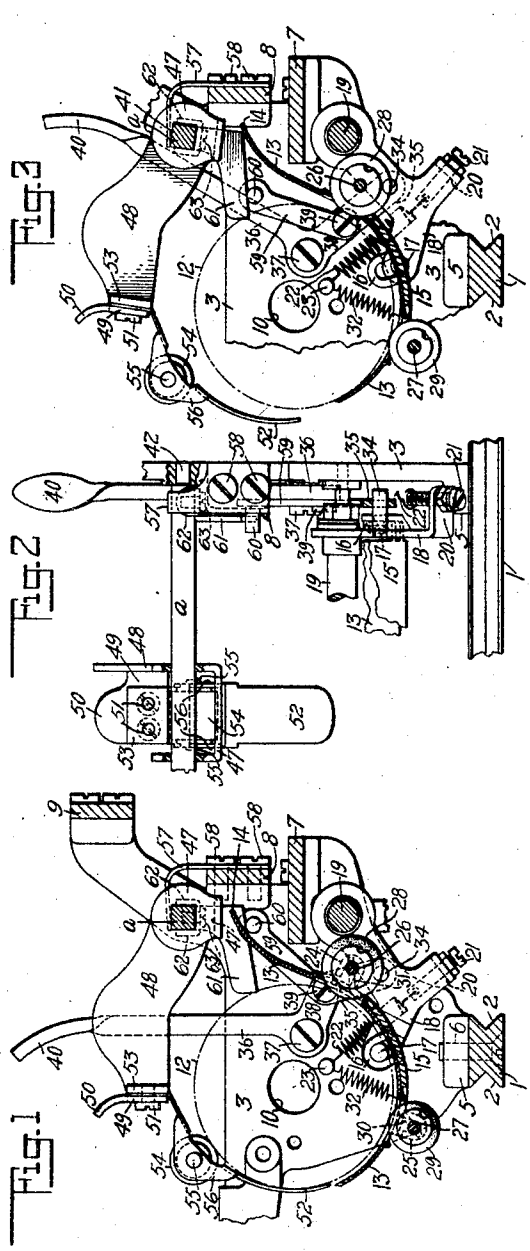


Fig. 1

Fig. 2

Fig. 3

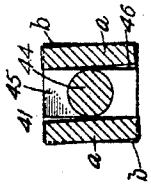


Fig. 4

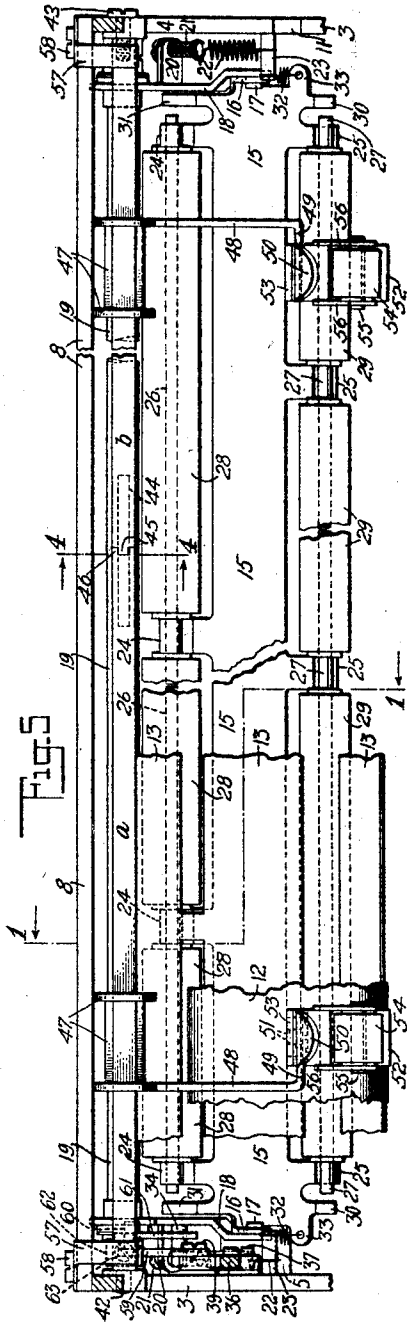


Fig. 5

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UNITED STATES PATENT OFFICE.

GEORGE G. GOING, OF MIDDLETOWN, CONNECTICUT, ASSIGNOR TO REMINGTON-NOISELESS TYPEWRITER CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TYPEWRITING MACHINE.

Application filed July 13, 1925. Serial No. 43,073.

My invention relates to typewriting and like machines, and more particularly to the paper feed mechanism thereof.

The main object of my present invention, generally stated, is to provide comparatively simple, and yet highly efficient, paper feed mechanism.

More specifically stated, one of the main objects of the invention is to provide improved mechanism of the character specified in which various of the paper feed devices may be simultaneously released by the actuation of a single key, or in which certain of said devices may be independently released and if desired thrown off beyond the released position without affecting the other devices to perform their function and without being affected thereby.

A further object of my invention is to embody such mechanism in existing constructions without material modification thereof.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, arrangements of parts, and combinations of devices set forth in the following description and particularly pointed out in the appended claims.

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the different views,

Figure 1 is a detail transverse sectional view of a carriage equipped with the devices of my invention, the section being taken on the line 1—1 of Fig. 5 and looking in the direction of the arrows at said line and with the parts shown in normal or operative condition.

Figure 2 is a fragmentary rear view with parts in section and parts broken away, showing some of the devices represented in Fig. 1 which are located near the left-hand end of the carriage.

Figure 3 is a view corresponding in part to Fig. 1 except that the paper feed devices are shown in the released position.

Figure 4 is an enlarged detail transverse sectional view taken through the two-part rock shaft which supports the paper fingers, the section being taken on the line 4—4 of Fig. 5 and looking in the direction of the arrows at said line.

Figure 5 is a fragmentary top plan view of the carriage with parts in section and parts broken away.

I have shown my invention embodied, in the present instance, in the carriage of a Remington-noiseless No. 6 machine, though obviously the features of my invention are applicable to typewriting and like machines generally. Many features of the paper feed mechanism disclosed herein have been in use in the Nos. 4 and 5 noiseless machines, but are referred to more or less in detail in order to arrive at an understanding of the features of the present invention in co-operation therewith.

The carriage of a Remington-noiseless machine includes a main cross bar 1 provided with oppositely disposed ball races 2 therein in which are received antifriction crossed bearing rollers by which the carriage is supported. End plates 3 and 4 have foot pieces 5 by which the end plates are secured to the cross bar 1 by screws 6. An additional cross bar 7 and two scale bars 8 and 9 provide further additional connections between the end plates and by which they are held firmly united. Bearing openings 10 and 11 are provided in the end plates 3 and 4 respectively, to receive bearings for a cylindrical platen 12. The usual paper deflector or combined paper apron and table 13 of slightly flexible sheet metal extends substantially throughout the length of the carriage beneath the platen, terminating at its upper rear edge 14 in the rear of the platen and at its front edge beneath the printing line at the front of the platen. The usual comparatively heavy sheet metal supporting strip 15 is riveted to the bottom of the deflector and extends throughout the length thereof. Each end of the strip 15 has an upturned ear 16 slotted vertically with the upper end of the slot closed and its lower end open. These slotted ears constitute bearings by which the paper deflector is detachably supported on pins 17 that extend inwardly from supporting arms 18. These arms are fixed to a rock shaft 19 journaled at their ends in bearings in the end plates 3 and 4. Each arm 18 has an inwardly extending projection 20 tapped to receive an adjusting screw 21 with a hole therethrough to receive one end of a contractile spring 22 which has its opposite end connected to a pin 23 that extends inwardly from the associated end plates 3 or 4 of the carriage. The power of these springs is exerted to move the arms

18 and pins 17 upwardly and cause the deflector to be held up in operative position as shown in Fig. 1 and apply pressure to the feed rollers carried by the deflector.

An adjustment of each of the screws 21 is effective to vary the force exerted by the associated spring at the corresponding end of the platen. In addition to the comparatively heavy strip 15 having the supporting ears 16 it is also provided with two series of bearing strips 24 and 25 bent up therefrom, as shown in dotted lines in Fig. 1, to form hook-like bearing members for the shafts or spindles 26 and 27 respectively. Each of these shafts is slightly flexible and extends substantially throughout the length of the platen and is loosely seated in its bearings in the associate supporting strips 24 or 25. A set of co-axially arranged main feed rollers 28 (three in number in the present instance) is loosely mounted on the shaft 26 and extends substantially throughout the length of the platen. A second set of co-axially arranged forward main feed rollers 29 (three in number in the present instance) is loosely mounted on the shaft 27 and extends substantially throughout the length of the platen. The present construction embodies a special arrangement of the feed rollers 28 and 29. Thus it will be seen that the left-hand terminal feed roller 28 is comparatively short, whereas the two remaining feed rollers of the set are comparatively long. On the other hand, the right-hand feed roller 29 is comparatively short, whereas, the other two rollers 29 are comparatively long. By this staggered arrangement of the feed rollers there is a fore-and-aft break-joint effected between the rollers of the two sets, and there is no space between the rollers of one set that is not crossed by a roller of the other set. Therefore there is no point in the length of the two sets of rollers where a roller of either one set or the other does not co-act with the paper to effectively feed it. Moreover, there is no vertical line or field throughout the width of the paper where one or another feed roller 28 or 29 does not bear with a substantially uniform pressure. Therefore in the production of carbon copies there is no observable "tracking" from the carbon sheets on the carbon copies, as sometimes occurs when the front and back feed rollers are mounted in tandem arrangement or fore-and-aft alignment with spaces between them where the feed rollers of neither set coact with the paper. In the present construction the two relatively short terminal rollers are of the same length and the four relatively long rollers are of the same length.

The strip or member 15 near the ends thereof is provided with two forwardly projecting bendable fingers 30 and two rearwardly extending bendable fingers 31. The fingers 30, when in effective position, cross the axis of the shaft 27 to limit the endwise displacement of said shaft and aid in assembling the parts. The fingers 31 in a like manner are adapted to coact with the shaft 26.

Openings are provided in the deflector 13 through which the feed rollers 28 and 29 may extend to bear against the platen under the pressure of the springs 22. A light spring 32 is connected at one end to an ear 33 on the strip 15 and is connected at its other end to a pin 23. There are two of these springs 32, one at each end of the deflector 13 to prevent it from dropping freely away from the platen at its forward edge when feed rollers are released, as shown in Fig. 3, although the slight force exerted by these springs is just about sufficient for this purpose.

I employ the usual release mechanism in order to move the paper deflector and feed rollers 28 and 29 to releasing position, shown in Fig. 3. This mechanism includes a pin 34 that projects outwardly from the left-hand supporting arm 18 and forms a pivot for a link 35. This link forms one member of a toggle, the other member of which is formed by a release lever 36 pivoted on a headed screw pivot 37 received at its threaded end in a tapped opening in the end plate 3. The short arm 38 of this lever is pivoted at 39 to its companion toggle member 35, whereas the long arm of the lever 36 terminates in a finger piece 40 by which the parts may be controlled. When said finger piece is shifted from the Fig. 1 to the Fig. 3 position, where it is arrested by a rock shaft 41, the toggle will be shifted to the substantially straight line position, represented in Fig. 3, where it and the parts controlled thereby, are held against return movement by the dead centering of the toggle. This movement of the toggle resulted in forcing the left-hand supporting arm 18 from the Fig. 1 to the Fig. 3 position against the power of the left-hand springs 22 and 32, and also in rocking the shaft 19. The rocking of this shaft causes the supporting arm 18 at the other end of the carriage to partake of the movement of the left-hand arm 18 and to release the pressure of both sets of the springs 32 and 22 on the paper deflector and feed rollers 28 and 29.

In accordance with my present invention I provide paper fingers and marginal paper feed rollers mounted on a support above and in the rear of the platen and which are adjustable longitudinally of the platen. I also have provided means whereby a movement of the finger piece 40 to releasing position is additionally effective to release the paper fingers and margin feed rollers, and whereby said paper fingers and margin rollers may be independently shifted to releasing position or may be moved beyond said position to and maintained in an inoperative

position entirely away from the work sheets. This construction will now be described. The rock shaft 41, hereinbefore referred to, is in the nature of a two-part shaft pivotally mounted at its outer ends on the end plates 3 and 4, and is located in the rear of the platen and back of and above the place where paper is introduced at the introductory side of the platen. At one end the shaft is reduced, as at 42, (Fig. 2) where it is received in a bearing opening in the end plate 3, whereas the opposite end of the shaft is tapped to receive a headed pivot screw 43 loosely seated in a bearing opening in the end plate 4. The rock shaft 41 is angular in cross section and comprises two sections *a* and *b* united in the middle thereof by a joint (shown on an enlarged scale in Fig. 4) which causes the sections to be supported one by the other and permits each section to turn a limited distance independently of the other, for purposes which will hereinafter appear. A dowel pin 44 of this joint is fixed in an axially disposed opening in the inner end portion of the section *b* and extends loosely into a corresponding opening in the adjacent end of the section *a*, in order to support one section by the other but permit a turning movement of each section independently of the other. This relative turning movement of the sections is limited by a tongue 45 on the inner end of the section *b* which is loosely seated in a corresponding groove in the section *a*. The extent of relative turning movement between the sections afforded by the loose tongue and groove connection is slight, as indicated on an enlarged scale in Fig. 4. When one section turns relatively to the other a distance sufficient to bring the side walls of the tongue 45 into contact with the inner walls of the groove 46, a shown in Fig. 4, then further independent movement between the sections in one direction will cease and they will turn together. This construction and arrangement of the rock shaft is for the purpose of applying independent pressure to each of the two paper fingers carried by sections of the shaft and yet enable a turning movement of the shaft to release both paper fingers as will presently appear.

Each section of the rock shaft 41 is received in a rectangular opening in a sheet metal yoke-like paper finger carrier or support 47, the outermost arm 48 of which extends forwardly over the platen and terminates in an inwardly bent or off-set end portion 49. A curved upward extension of this bent end forms a finger piece 50. Two screws 51 pass through openings in the part 49 and through an opening in the upper end portion of a flexible paper finger 52, and are received in tapped openings in a clamping plate 53 in the rear of the part 49. The paper finger is thus secured to its carrier 47 which may be adjusted to different positions longitudinally of the platen by sliding it along its shaft section *a* or *b*. Each paper finger is apertured opposite its margin feed roller 54 which is adapted to turn on a pivot pin 55 carried by ears 56 struck up from the paper finger. There are two of these paper fingers, one carried by each shaft section *a* or *b* and each is maintained in effective position to coact with the platen, or the paper thereon, by an independent spring 57. Each of these springs is in the nature of a flat leaf-spring secured in place at one end by two screws 58 by which the scale bar 8 is connected to the end plates 3 and 4. The free end portion of each spring 57 normally makes contact with and bears downwardly against the forward top edge portion of the upper flat side of the associated shaft section *a* or *b*, and forward of the pivotal axis of said shaft, as shown in Fig. 1, causing the companion paper finger and margin feed roller to be pressed against the platen or the paper thereon.

By reason of the joint in the rock shaft each paper finger is pressed against the platen independently of the other to effectively feed the paper. Therefore, if for example, a greater thickness of paper should be fed under one paper finger than is fed under the other, the first mentioned finger may be forced against the power of its individual spring 57 away from the platen without decreasing the effectiveness of the other paper finger to aid in feeding the paper of lesser thickness with which it coacts. When, however, the limit of lost motion provided for by the joint between the shaft sections is taken up, then the two shaft sections will turn together in order, for example, that the paper fingers may be shifted to releasing position, such as is indicated in Fig. 3, by means which will now be described.

It will be understood that at any time both paper fingers may be simultaneously moved to the releasing position indicated in Fig. 3 by rocking the two-part shaft with the aid of the finger piece 50 on either paper finger. When the operator lets go the finger piece 50, the paper fingers will re returned under spring pressure to effective position. By reason of the construction and arrangement of the parts, and due to the fact that the springs 57 are disconnected from both the paper fingers and the shaft sections (although they coact directly with the latter), the paper fingers may be simultaneously swung back to and held in substantially an upright position in the rear of the platen. This movement of the paper finger beyond the releasing position, shown in Fig. 3, and to a thrown-off ineffective position, carries them entirely away from the work sheets where they can offer no obstruction to or interference with the manipu-

lation of the work sheets in the machine or with their introduction therein. This materially facilitates making corrections or erasures on work sheets in the machine, where ordinarily the fingers, if not mounted so that they may be moved to such thrown-off position, might interfere with this work and might require a separate displacement of each finger outwardly along a shaft section away from the paper and then require a separate readjustment of each paper finger back to its original effective position after the correction is made. It will be observed that when the paper fingers are moved back to the thrown-off position as described, what is normally the front flat face of each shaft section *a* and *b* is carried up and extends substantially in a horizontal position where the associated spring 57 will coact therewith and bear against the center of the shaft to hold the parts in the shifted position indefinitely, or until the paper fingers are swung down into effective position by the operator.

In order to automatically release the paper fingers when the feed rollers 28 and 29 are released, I provide the toggle link 35 with an extension or arm 59 carrying an inwardly extending pin or contact 60 at the free end thereof. This pin underlies and coacts with a downwardly and forwardly extending crank arm 61 secured to the shaft section *a* near its outer end. In the present instance this arm 61 is formed from sheet metal, and as part of a yoke-like supporting socket 62 shaped to conform to and engaging the shaft section on three sides, as shown in Fig. 3. A headed screw 63 is received at its threaded end in a tapped opening in the shaft section *a* after having passed through a hole supporting socket and thus firmly connects the crank arm 61 to said shaft section.

When the finger piece 40 is moved from the Fig. 1 to the Fig. 3 position to release the feed rollers, the straightening of the toggle causes the pin 60 to coact with and lift the arm 61. This results in turning the two-part rock shaft 41 and in automatically moving the paper fingers to releasing position shown in Fig. 3, holding them in such position until the parts are returned to effective position by moving the finger piece forward to the Fig. 1 position.

It will be observed that while there is an operative connection between the feed roller releasing means and the paper fingers, nevertheless this connection is such that it does not interfere with the separate and independent movement of the paper fingers to releasing position shown in Fig. 3, or to the further thrown-off position hereinbefore described.

It will be seen that by my present invention I have provided simple and highly efficient paper feed mechanism for accomplishing the results pointed out, and that such means may be readily incorporated in the Remington-noiseless No. 6 or the noiseless No. 4 or No. 5 machines without material modification of the features of construction existing in such machines.

While I have described the present construction with considerable detail it should be understood that various changes may be made, and parts thereof may be employed without others, without departing from my invention as it is defined in the accompanying claims.

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

1. In a typewriting or like machine, the combination of a platen, a two-part rock shaft arranged in the rear of the platen, means for connecting the parts of said shaft so as to permit a limited turning movement of each part independently of the other and then cause both parts to turn together, a separate spring co-operative with each part of the rock shaft, and a paper finger carried by and adjustable along each part of the rock shaft and mounted to turn therewith and having a support extending forward over the platen from said rock shaft.

2. In a typewriting or like machine, the combination of a platen, a two-part rock shaft, means for connecting the parts of said shaft so as to permit a limited turning movement of each part independently of the other and then cause both parts to turn together, a separate spring disconnected from but co-operative with each part of the rock shaft, and a paper finger carried by and adjustable along each part of the rock shaft and mounted to turn therewith, the construction and arrangement of the parts being such that each of said springs normally applies its force to the associated paper finger independently of the other to hold it in effective position and return it to said position from the released position and also permits said shaft and fingers to be turned beyond the released position to a thrown-off ineffective position where the springs become effective to hold the shaft and fingers in said thrown-off position.

3. In a typewriting or like machine, the combination of a platen, a two-part rock shaft, means for connecting the parts of said shaft so as to permit a limited turning movement of each part independently of the other and then cause both parts to turn together, each part of said shaft having a contact portion and separate leaf springs each disconnected from said shaft but normally adapted to bear against the contact portion of the associated part of the shaft to one side of the center thereof in order to tend to turn it, and each spring exerting its force against the dead center of the shaft when it

is turned to move the paper fingers to a thrown-off ineffective position and to hold the shaft and fingers in such position.

4. In a typewriting or like machine, the combination of a platen, a two-part rock shaft, means for connecting the parts of said shaft so as to permit a limited turning movement of each part independently of the other and then cause both parts to turn together, a separate spring disconnected from but co-operative with each part of the rock shaft, a paper finger carried by and adjustable along each part of the rock shaft and mounted to turn therewith, paper feed rollers, a finger piece, and means controlled thereby for releasing said feed rollers and for simultaneously moving said paper fingers to releasing position.

5. In a typewriting or like machine, the combination of a platen, a two-part rock shaft, means for connecting the parts of said shaft so as to permit a limited turning movement of each part independently of the other and then cause both parts to turn together, a separate spring disconnected from but co-operative with each part of the rock shaft, a paper finger carried by and adjustable along each part of the rock shaft and mounted to turn therewith, paper feed rollers, a finger piece, means controlled thereby for releasing said feed rollers and for simultaneously moving said paper fingers to releasing position, and means that enable said paper fingers to be simultaneously moved beyond said releasing position without affecting said feed rollers.

6. In a typewriting or like machine, the combination of a platen, a two-part rock shaft, means for connecting the parts of said shaft so as to permit a limited turning movement of each part independently of the other and then cause both parts to turn together, a separate spring disconnected from but co-operative with each part of the rock shaft, a paper finger carried by and adjustable along each part of the rock shaft and mounted to turn therewith, a paper apron, paper feed rollers, a finger piece, and means controlled by said finger piece for simultaneously moving said paper apron, feed rollers and paper fingers to releasing position.

7. In a typewriting or like machine, the combination of a platen, a two-part rock shaft, means for connecting the parts of said shaft so as to permit a limited turning movement of each part independently of the other and then cause both parts to turn together, a separate spring disconnected from but co-operative with each part of the rock shaft, a paper finger carried by and adjustable along each part of the rock shaft and mounted to turn therewith, a paper apron, paper feed rollers, a finger piece, and means controlled by said finger piece for simultaneously moving said paper apron, feed rollers and paper fingers to releasing position, the construction and arrangement of the parts being such as to enable said paper fingers to be simultaneously moved beyond said releasing position to a thrown-off position without affecting said paper apron and feed rollers and for holding the fingers by said springs in such thrown-off position.

8. In a typewriting or like machine, the combination of a platen, a two-part rock shaft arranged in the rear of the platen, means for connecting the parts of said shaft so as to permit a limited turning movement of each part independently of the other and then cause both parts to turn together, a separate spring co-operative with each part of the rock shaft, a paper finger carried by and adjustable along each part of the rock shaft and mounted to turn therewith and having a support extending forwardly over the platen from said rock shaft, a margin feed roller carried by each of said fingers, paper feed rollers, a release key therefor, and means controlled thereby for simultaneously releasing said paper fingers when the feed rollers are released.

9. In a typewriting or like machine, the combination of a platen, a rock shaft arranged in the rear of the platen and comprising two sections arranged end-to-end and angular in cross section, means for connecting said sections so as to have a limited turning movement one independently of the other but cause said sections to turn together after said limited independent movement is taken up, separate springs one co-operative with each of said sections and tending to turn it, a paper finger carried by and adjustable along each of said sections and having a supporting member with an opening therein that corresponds to the angular cross section of the shaft section on which it is mounted so as to turn therewith, said supporting members extending from said shaft over the platen and the fingers extending down in front of the platen, a finger piece, means controlled thereby for turning said shaft to simultaneously release both of said paper fingers, and means that enable said shaft and fingers to be turned beyond said releasing position to a thrown-off position and to be held indefinitely in such thrown-off position.

10. In a typewriting or like machine, the combination of paper feed rollers, releasing means therefor including hand controlled toggle members which in the dead centered position hold the feed rollers released, a rock shaft, paper fingers carried by and adjustable along said rock shaft, an arm on said rock shaft, and a contact on one of said toggle members adapted to coact with said arm and rock the shaft to release said paper fingers when the toggle is moved to releasing position.

11. In a typewriting or like machine, the combination of paper feed rollers, releasing means therefor including hand controlled toggle members which in the dead centered position hold the feed rollers released, a rock shaft comprising two members arranged end to end and connected to receive a limited independent turning movement, a separate spring for each member of said shaft, a paper finger carried by and adjustable along each shaft member, an arm on one of said shaft members, and a contact on one of said toggle members adapted to coact with said arm and rock the shaft to release the paper fingers when the toggle is moved to releasing position.

12. In a typewriting or like machine, the combination of paper feed rollers, releasing means therefor including hand controlled toggle members which in the dead centered position hold the feed rollers released, a rock shaft, paper fingers carried by and adjustable along said rock shaft, an arm on said rock shaft, a contact on one of said toggle members adapted to coact with said arm and rock the shaft to release said paper fingers when the toggle is moved to releasing position, and means which enable said rock shaft with the paper fingers thereon to be rocked beyond the releasing position to a thrown-off position and to be held in such thrown-off position without affecting or being affected by said toggle members.

13. In a typewriting or like machine, the combination of a paper apron, rear feed rollers, forward feed rollers, a rock shaft, paper fingers carried by and adjustable along said shaft, releasing means including a finger piece and toggle members controlled thereby, means by which the paper apron, rear and forward feed rollers and paper fingers are moved to and held in released position when said toggle members are in the dead centered position, and means which enable said paper fingers and rock shaft to be turned beyond the releasing position without affecting said toggle members and finger piece and without being affected thereby.

14. In a typewriting or like machine, the combination of a set of separate rear independently rotatable main paper feed rollers that extend substantially throughout the length of the platen, a second set of separate forward main paper feed rollers, said rollers of the two sets being constructed and relatively arranged so that rollers of one set will coact with the paper at every point where rollers of the other set fail to contact therewith through the entire length of the two sets of feed rollers.

15. In a typewriting or like machine, the combination of a set of separate independently rotatable rear main paper feed rollers that extend substantially throughout the length of the platen, a second set of separate forward main paper feed rollers, said rollers of the two sets being constructed and arranged to provide a fore-and-aft break-joint arrangement throughout the entire length of the two sets of feed rollers, substantially as and for the purposes specified.

16. In a typewriting or like machine, the combination of a set of co-axial rear main paper feed rollers comprising a relatively short feed roller at one point in the set, the remaining rollers of the set being relatively long; and a second set of forward co-axial main paper feed rollers comprising a relatively short feed roller opposite a long feed roller of the first set, the remainder of the feed rollers of the second set being relatively long.

17. In a typewriting or like machine, the combination of a set of separate co-axial rear main feed rollers that extends substantially throughout the length of the platen and comprises a relatively short feed roller at one end of the set, the remainder of the feed rollers of the set being relatively long; and a second set of separate co-axial front main feed rollers comprising a relatively short feed roller at the opposite end of the set from that where the corresponding short feed roller of the other set is located and which is forward of a long roller of the first set, the remaining rollers of the second set being relatively long, substantially as described and for the purposes set forth.

18. In a typewriting or like machine, the combination with a platen; of a set of independently rotatable aligned paper feed rollers, three in number and maintained spaced apart, two of the three of said feed rollers being of the same length and relatively long, the third feed roller being relatively short and arranged at one end of the aligned set; and a second set of aligned independently rotatable paper feed rollers, three in number and maintained spaced apart, two of the second set of feed rollers being of the same length and relatively long, the third roller of the second set being relatively short and arranged at one end of the set and opposite the long end feed roller of the other set, the arrangement of the two sets of feed rollers being such that the spaces between the feed rollers of each set are overlapped by the rollers of the other set.

Signed at Middletown, in the county of Middlesex and State of Connecticut this 9th day of July, A. D. 1925.

GEORGE G. GOING.