

A. W. SMITH.
TYPE WRITING MACHINE.
APPLICATION FILED FEB. 23, 1912.

1,050,245.

Patented Jan. 14, 1913.

2 SHEETS—SHEET 1.

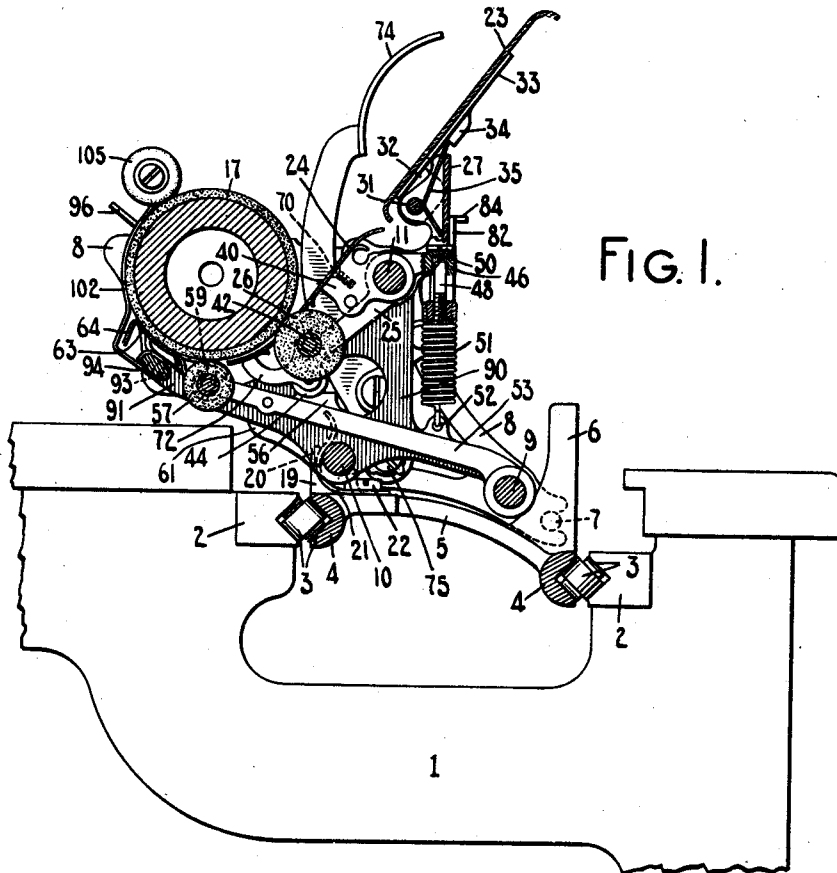


FIG. 1.

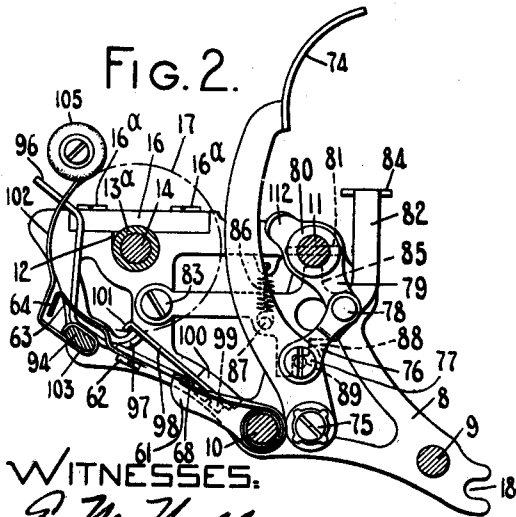


FIG. 2.

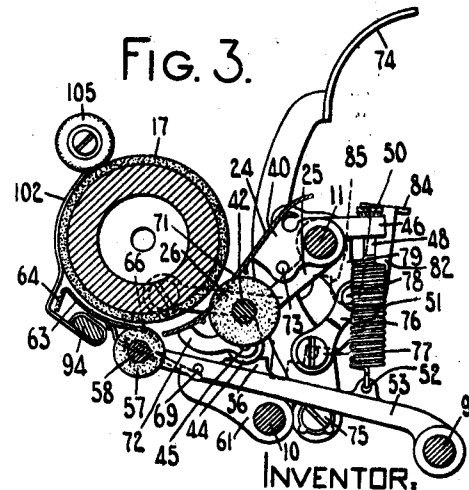


FIG. 3.

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2 SHEETS-SHEET 2.

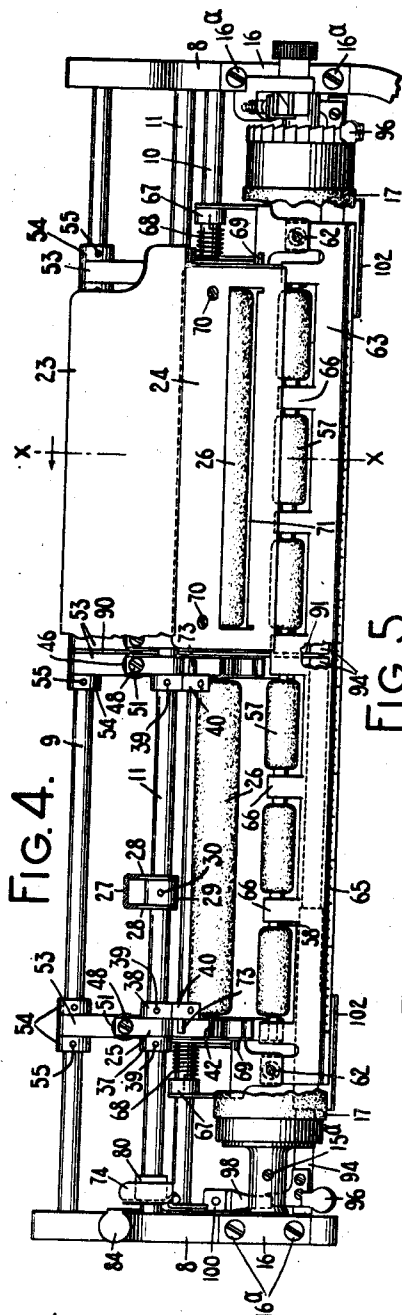


FIG. 4.

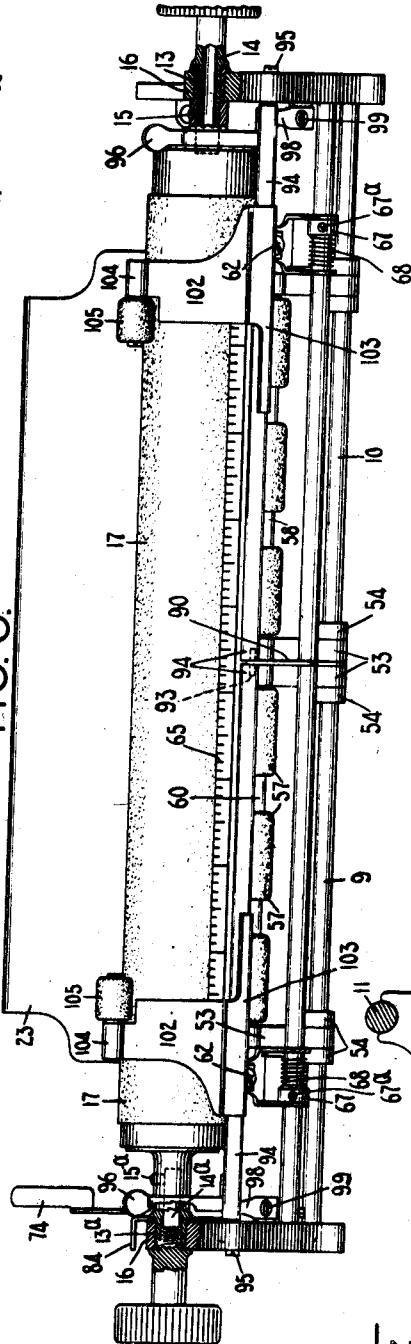
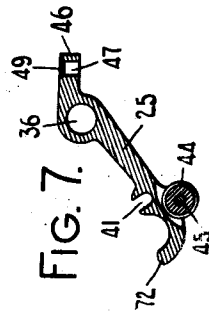


FIG. 5.



UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

1,050,245.

Specification of Letters Patent.

Patented Jan. 14, 1913.

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To all whom it may concern:

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

10 This invention relates to typewriting machines and more particularly to paper feeding and controlling means for such machines.

15 The objects of the invention, generally stated, are to provide paper controlling means which are comparatively simple in construction; which are effective in use; and which are of such a character as to facilitate the manufacture and embodiment thereof in the machines.

20 A further object of the invention, more specifically considered, is to provide paper controlling means which may, without modification, be readily embodied in carriages of various lengths.

25 To the above and other ends which will hereinafter appear, the invention consists in certain features of construction, combinations of devices and arrangements of parts to be hereinafter described and particularly pointed out in the appended claims.

30 In the accompanying drawings, wherein like reference characters indicate like parts in the various views, Figure 1 is a fragmentary vertical sectional view showing a carriage embodying the invention and the manner of mounting the same, the section being taken on the line $x-x$ of Fig. 4 and looking in the direction of the arrow at said line. Fig. 2 is a corresponding sectional view of the same with some of the parts omitted, the section however being taken through the carriage near the left-hand end thereof. Fig. 3 is a view which corresponds to Fig. 1, with some of the parts omitted and the parts shown disposed as they appear when the feed rollers are released or thrown off. Fig. 4 is a fragmentary plan view of a portion of the carriage with parts broken away. Fig. 5 is a front view of the same with parts in section. Fig. 6 is a detail side

view of the brace plate and the tie rods and rock shaft with which it co-acts, such rods and shaft being shown in section. Fig. 7 is a detail longitudinal sectional view of one of the hangers for the rear or main feed rollers.

The invention is shown embodied in the present instance in a front strike typewriting machine in which the printing instrumentalities strike against the front face of the platen.

The frame of the machine comprising side plates 1 support oppositely grooved fixed carriage rails 2 which receive anti-friction rollers 3 that are also received in oppositely grooved tracks 4 of a carriage truck 5. The carriage as a whole is thus supported to travel from side to side of the machine under control of suitable carriage feed mechanism, not shown.

75 The truck section 5 is provided with upwardly extending lugs 6 located at different points in the length thereof. There may be two, four or more of these lugs, depending on the length of the carriage, for purposes which will hereinafter more clearly appear. Each of these lugs has an outwardly extending pin 7 projecting therefrom. The carriage also comprises a second section 80 which is detachably mounted on the truck section. The second section of the carriage will hereinafter be referred to as the platen frame and it is made up of end plates 8 united by cross bars or racks 9 and 10 and a rock shaft 11. Each end plate 8 has an outline best shown in Fig. 2 and is provided with openings therethrough. A recess 12, is formed in each end plate for the reception of a circumferentially shouldered bearing sleeve 13 or 13^a formed as a part of or fixed to the associated platen head. These sleeves constitute bearing spindles for the platen 17 to support it in its turning movement in the journal bearings formed by the recesses 12. The right-hand sleeve 13 is formed with a circumferential groove, the width of which corresponds substantially to the thickness of the journal bearing which is received therein, thus forming shoulders 100 on opposite sides of the journal bearing to prevent a displacement of the sleeve in the

bearing longitudinally of the platen. The right-hand finger wheel is provided with a hollow spindle 14 which is received in the right-hand bearing sleeve 13, and is connected therewith by a set screw 15. The left-hand bearing sleeve 13^a is formed as a part of the left-hand platen head and has a circumferential shoulder at the inner side of the journal bearing. The left-hand finger wheel is provided with a spindle 14^a which is threaded for cooperation with internal threads in the bearing sleeve 13^a. The spindle 14^a is provided with a circumferential shoulder which is adapted to bear against the associated journal bearing on the outer side thereof when the spindle is threaded in place in its bearing sleeve.

A set screw 15^a is received in a tapped opening in the cylindrical extension of the platen head and bears at its inner end against the spindle 14^a, to secure the spindle and left-hand finger wheel to the platen head and in the position to which the spindle has been adjusted by its threaded connection with the bearing sleeve. It will be understood that the adjustable circumferential shoulder on the spindle of the left-hand finger wheel, contacting with the outer side of the journal bearing, takes up any lost motion that may exist between the bearing sleeves and the journal bearings, considered longitudinally of the platen, and that the parts are so constructed that the platen itself with the bearing sleeves carried thereby, constitute a tie or connection between the end plates of the platen frame at the axis of the platen.

Each bearing sleeve 13 and 13^a is prevented from being displaced upwardly from its journal bearing by a block 16 which is detachably held on its end plate, and over the associated recess 12, by screws 16^a. By removing these blocks the bearing sleeves, together with the platen and finger wheels and spindles, may be removed from the platen frame.

The lower end of each end plate 8 of the platen frame is provided with a recess 18 that opens rearwardly and is adapted to receive one of the pins 7 carried by the truck. It has been pointed out that there may be two, four or more lugs 6 and pins 7, depending on the length of the carriage. If, for example, the truck be a long one, four or more such lugs and pins may be provided at different points in the length of the truck for cooperation with the end plates 8 on platen frames of different lengths, varying from a long to a short platen frame. The pin and slot connection, formed by the pins 7 and slots or recesses 18, constitutes means whereby the platen carrying section of the carriage may be pivotally and detachably connected with the truck section. Thus,

when the parts are connected as represented in Fig. 1, the cross bar 10 rests on lugs 19 on the truck. These lugs have upwardly projecting extensions 20 against which the cross bar 10 bears to prevent the forward displacement of the platen frame. Spring catches 21 (Fig. 1) which are in the nature of curved leaf springs, are secured by screws 22 to the truck. These catches are so formed that an upward swinging or pivotal movement of the platen frame around the pins 7 from the position shown in Fig. 1 will cause the spring catches to be flexed forwardly to release the rod 10 and enable the platen frame to be detached. In replacing the platen frame a downward pivotal movement thereof around the pivot pins 7 will cause the spring catches to snap over and engage the rod as shown in Fig. 1, and hold the platen frame against accidental upward displacement.

A description of various of the features thus far described is given in order that other features which are to be hereinafter described may be better understood.

The cross rods 9 and 10 and the rock shaft 11 may be connected with the end plates 8 in any suitable manner, though the platen itself and the rock shaft 11, as well as the rods 9 and 10, are preferably so connected with the end plates 8 as to constitute tie rods or connections between them. The rock shaft 11 constitutes a support for the paper table 23, the paper apron sections 24 and the hangers 25 of the main or rear paper feed rollers 26. Thus two sheet metal brackets, each of which is substantially U-shaped in cross section and which is designated as a whole by the reference numeral 27 pivotally support the paper table in place. Each of these brackets has depending arms 28 (see Fig. 4) which are perforated and fixed on reduced ends of a sleeve 29. A pin 30 passes through each sleeve and fixes the associated bracket to the shaft 11. The side arms of each bracket 27 are extended forwardly and are tapped to receive a screw 31, which screw extends at its outer end beyond the bracket arm to form a pivot. This pivot is received in a bearing opening in an ear 32 formed as a part of a plate 33 which is soldered or otherwise secured to the back of the paper table 23. A pocket 34 is formed in each plate 33 to receive one end of a spring 35 which is coiled around the screw 31 of the associated bracket and bears at its opposite end against the bracket 27. The force of each spring 35 is exerted to turn the paper table rearwardly around the pivots 31 and to cause the paper table to rest against the brackets 27.

The construction of each feed roll hanger is best shown at Fig. 7, from which it will be understood that each of said hangers

is perforated at 36 to form a bearing opening for the reception of the rock shaft 11. Each hanger 25 is mounted to turn freely on the rock shaft 11, and collars 37 and 38 are fixed by pins 39 on the rock shaft at opposite sides of each hanger. These collars prevent the hangers 25 from moving longitudinally of the shaft. Each of the collars 38 is extended downwardly and forwardly to form a crank arm 40 for purposes which will hereinafter appear. Each hanger 25 is recessed at 41 (Fig. 7) to receive one end of a shaft 42 which carries one or more of the main or rear feed rollers 26. Each hanger 25 is also recessed to receive an anti-friction roller 44 which is pivoted at 45 on the hanger. In the present instance four hangers 25 are shown, each associated pair of such hangers supporting a shaft 42 and a feed roller 26. The feed rollers 26 and shafts 42 are aligned, the latter virtually constituting a divided shaft, each section of which is individually supported on separate individually spring pressed pivoted hangers. Each hanger 25 is extended rearwardly of the rock shaft 11, which constitutes a pivot for the hangers, so that each of said hangers forms in effect a lever of the first order. The rearward extension on each of these hangers is indicated at 46 and this extension is perforated at 47 to receive a headed screw 48 which extends freely through said opening. The inner wall of the opening 47, at the upper portion thereof, is serrated, as indicated at 49, for coöperation with serrations 50 on the underside of the head of the screw 48. The serrations 49 and 50 interlock to prevent the screw 48 from turning accidentally from the position to which it is adjusted. The lower threaded end of each screw 48 is received in a tapped opening in a nut that is externally threaded for the reception in and coöperation with the coils of a contractile spring 51. The lower end of each spring 51 is connected at 52 to an ear formed on a feed roll hanger 53 intermediate the ends thereof. There is a hanger 53 for each of the hangers 25, the former being situated beneath the latter. The hangers 53 are pivoted on the cross rod 9, each hanger constituting a lever of the third order, and each of said hangers is held against movement along the rod by collars 54 fixed to the rod on opposite sides of each of the hangers by pins 55. Each hanger 53 is provided on the upper side thereof with a cam 56 coöperative with the grooved periphery of the anti-friction roller 44 of the hanger 25 immediately above it. It will be understood that each spring 51 is connected at one end to a hanger 25 and at its opposite end to a hanger 53 directly beneath it, and that each spring is effective to move the forward end of both hangers,

and the feed rollers carried thereby, toward the platen. It will also be understood that a variation in the force exerted by the spring, through an adjustment of its screw 48, is effective to vary the force applied by said spring to both sets of feed rollers. The forward feed rollers 57 are mounted on a shaft 58, which is received at its ends in openings 59 in the hangers 53, said openings being similar to the openings 41 in the hangers 25.

Sheet metal hangers 61 are pivoted upon the cross rod 10 and extend forwardly therefrom and are connected by screws 62 to a paper apron section 63, which latter extends throughout, or substantially throughout, the length of the platen. The forward end portion of this paper apron section is bent downwardly, as indicated at 64, to provide a front face on which a platen scale is formed. Rearwardly extending fingers 66 are formed on the rear edge of this paper apron section, the fingers extending between the feed rollers 57 and to the rear of the axis thereof. The fingers are deflected downwardly at the free end portions thereof in order to effectively receive the paper as it is fed forwardly from the main paper feed rollers. Between the arms of each hanger 61 is a collar 67 which is fixed to the cross rod 10 by a set screw 67^a, as indicated in Fig. 5. One end of a coiled spring 68 is connected to this collar and the spring bears at its opposite end against the hanger, in order to force the hanger toward the platen and maintain the paper apron section against the platen, or the paper thereon. From an inspection of Fig. 3 it will be observed that a pin 69 projects laterally from the two outermost hangers 53 and extends over the hangers 61. By this arrangement a downward movement of the outermost hangers 53 is effective to move the hangers 61 down with them against the force of the springs 68, and to move the paper apron section 63 from the position indicated in Fig. 1 to that represented in Fig. 3.

The paper apron sections 24 are secured by screws 70 to the crank arms 40 which turn with the rock shaft 11, as hereinbefore pointed out. It will be understood, therefore, that these sections of the paper apron are fixed to move as the rock shaft is turned; that is to say, when the rock shaft is turned to release the feed rollers the sections 24 of the paper apron are moved from the position shown in Fig. 1 to that indicated in Fig. 3. Each section 24 of the paper apron is apertured, as at 71, to enable the associated main feed rollers to extend therethrough and into contact with the platen. The lower end of each paper apron section 24 terminates in the rear of the forward set of feed rollers and may be

supported at its lower end by upwardly extending arms 72 on the hangers 25. I preferably construct each paper apron section 24 of a length which corresponds approximately to the length of a rear feed roller 26 and to a set of forward feed rollers, for purposes which will hereinafter more clearly appear. Projecting laterally from each crank arm 40 is a pin 73 which extends over the associated hanger 25 forward of its pivotal support. It will be understood, therefore, that a rocking movement of the rock shaft 11 from right to left, as the parts appear in Fig. 1, is effective to carry the paper table 23 forwardly a slight distance; to turn the crank arms 40, thereby moving the paper apron sections 24 from the position shown in Fig. 1 to that indicated in Fig. 3; to effect a downward movement of the hangers 25 through the pins 73; to cause the anti-friction rollers 44 to cam the hangers 53 downwardly; and to effect a movement of the paper apron section 63 away from the platen through the engagement of the pins 69 with the hangers 61. It will be seen therefore that the paper feeding devices thus far described which cooperate with the platen, or the paper thereon, are all simultaneously moved away from the platen by a turning of the rock shaft 11.

A control of the rock shaft 11 is effected by a finger piece 74 which is in the nature of a lever that is pivoted at its lower end on a shouldered pivot screw 75, which latter is received in a tapped opening in the left-hand end plate 8 of the platen frame. The lever 74 is pivoted to a toggle link 76 by a shouldered pivot screw 77. The opposite end of this toggle link is pivoted by a shouldered screw 78 to a crank arm 79 which is provided with a collar 80. This collar surrounds the rock shaft 11 and is fixedly connected thereto by a pin 81. It will be understood, therefore, that when the finger piece 74 is moved rearwardly from the position shown in Fig. 2 to that indicated in Fig. 3, the rock shaft 11 will be turned from right to left, as the parts are viewed in these figures, thereby effecting the release of the various paper-feeding devices, as hereinbefore pointed out.

Provision has been made for effecting a locking of the paper feeding devices in the released position when desired. Thus from an inspection of Figs. 2 and 3, it will be seen that a locking device 82 is pivoted on a shouldered pivot screw 83 at one end, and is provided at its other end with a finger piece 84 by which the locking device may be depressed to locking position when desired. An upwardly extending projection 85 on the locking device is adapted to contact with the rock shaft 11 and thus

limit the upward pivotal movement of said locking device. A contractile spring 86 is connected at one end to a projection on the left-hand end plate of the platen frame and at its opposite end to a pin 87 which projects laterally from the locking device. A locking shoulder or abutment 88 is formed on the locking device for engagement with a laterally projecting pin 89 on the release lever or finger piece 74. When the finger piece is moved rearwardly to release the paper feed devices, the pin 89 is moved rearwardly with it to a position where the pin 89 may be engaged by the locking device. A depression of the finger piece 84 at this time is effective to move the locking device against the power of its spring 86 and bring the locking shoulder or abutment 88 into the path of the pin 89. This prevents the release lever and the parts controlled thereby from returning to normal position; it being understood that the excessive force of the various springs for the paper feed devices is effective to overcome the force of the returning spring 86 by which the locking device is returned to normal position. However, the locking device may be readily released by a further slight backward movement of the finger piece 74 to relieve the force of the various springs of the paper feed devices against the locking device. The spring 86 will then become effective to return the locking device to normal position, and when pressure is released from the finger piece 74 all of the parts controlled thereby may be returned to normal position by their respective springs.

It will be seen that a brace plate 90, which is shown in detail in Fig. 6, is apertured to receive the cross rod 9 and is also recessed in the edges thereof to receive the rock shaft 11 and cross rod 10. This brace plate is shown in the present instance about midway in the length of the carriage and extending in a plane fore and aft of the machine and transversely of the length of the carriage. The plate constitutes a bracing means between the tie rods 9 and 10 and the rock shaft 11 to form a more rigid construction and prevent a flexion of said rods and shaft. This brace plate is extended forwardly at the front end thereof to form an arm 91 provided with an opening 92 for the reception of a pivot pin 93 which is also received in openings at the inner ends of two bars 94. These bars and the parts carried thereby and the means for effecting a pivotal movement of the bars are alike, and a description of one of the bars and the parts carried thereby applies to the other, and but one will be described. Each bar is flattened on opposite sides thereof and at its inner end is pivoted at 93 near the lower edge of the bar. The corresponding pivot

at the other end of the bar is in the nature of a screw 95. This screw is received in a tapped opening in one of the end plates and extends therethrough to form a pivot at the inner end and on which the bar 94 may turn. A sheet metal finger piece 96 is connected to the bar near the outer end thereof, and by which the bar may be turned on its pivots. The sheet metal member from which the finger piece 96 is formed is extended rearwardly of the bar as at 97 to contact at its up-turned end with a leaf spring 98 secured by a screw 99 to a lug or projection 100 which extends inwardly from the associated end plate 8 of the platen frame. The forward free end of the spring 98 is bent downwardly to form an abutment 101 which coöperates with the part 97 to limit the turning movement of the bar 94 when the same is turned by a forward movement of the finger piece 96. This spring, therefore, acts in the two-fold capacity of applying pressure to the bar and limiting the pivotal movement thereof in one direction. A paper finger 102 is formed from sheet metal and has a portion 103 at the lower end thereof which surrounds the bar 94 and conforms to the shape thereof, so that the paper finger is connected to the bar to turn therewith but is free to be adjusted to different positions longitudinally of the bar. The upper end of the paper finger is turned to form a bearing 104 for the pivot of a margin feed roller 105. From the foregoing description it will be understood that each shaft or bar 94 is turned on its pivots by its spring 98 to apply the pressure of the paper finger and the margin feed roller to the platen, and that the finger piece 96 of each bar or shaft facilitates the turning of the shaft to remove the paper finger and margin feed roller from contact with the platen.

It will be seen that each of the paper apron sections 24, each of the feed rollers 26, each set of feed rollers 57 the various hangers by which the feed rollers are supported, &c., are made up in sections, so to speak, which may be regarded as units. It will likewise be seen that these units may be multiplied as desired for different lengths of carriages without modifying the various structural features of the devices, and without the necessity of carrying devices of different sizes or lengths in stock. If, for example, a longer carriage than that shown is intended to be built, the various feed devices shown may be employed, it merely being necessary to add another unit comprising a set of forward feed rollers 57, an additional feed roller 26, additional hangers, &c. In other words, instead of two sets of devices being employed, three or four sets of such devices may be used, de-

pending on the length of the carriage in which they are to be embodied. Of course, where a longer carriage is to be employed than that shown, the rods 9 and 10 and rock shaft 11 are made longer, as is necessarily the platen scale, but other parts of the carriage comprising the paper feed devices may be added as desired to make up a longer carriage. By arranging the paper feed devices in units in the manner described, it is unnecessary to manufacture various styles of paper feed devices or various sizes of paper feed devices for different lengths of carriages. Paper feed devices of a uniform character may be carried in stock and carriages of various lengths may be built up therefrom by increasing or decreasing the units which make up the paper feed devices. By this arrangement various size paper carriages may be made at less expense and with less trouble than where different size paper feed devices and different styles of paper feed devices are required for carriages of different lengths. Moreover, the paper feed devices of the present invention are comparatively simple in construction and are efficient in use.

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

1. In a typewriting machine, the combination with a cylindrical platen; a carriage therefor; paper feeding devices constructed and arranged in separate units that may be added to or subtracted from for carriages of different lengths, the device of each unit comprising a forward paper feed roller, a rear paper feed roller, separate independently movable hanger arms for the forward and rear feed rollers of each unit, and separate spring means for the feed rollers of each unit; and a sectional paper apron, each independent section of which corresponds in position to one of the units of the paper feeding devices.

2. In a typewriting machine, the combination of a platen, forward feed rollers, rear feed rollers, a divided shaft for the forward feed rollers, a divided shaft for the rear feed rollers, a plurality of separate hangers for each section of each of said shafts, and a single spring which connects a hanger of each forward shaft section with a hanger of each rear shaft section to force the forward and rear feed rollers toward the platen.

3. In a typewriting machine, the combination of a rock shaft, a set of feed roll hangers carried by said rock shaft, means controlled by said rock shaft for moving said feed roll hangers away from the platen, a paper apron fixed to said rock shaft to turn therewith, a second set of feed roll hangers, means for moving the last mentioned feed roll hangers away from the

platen when said first mentioned feed roll hangers are moved away from the platen, and a finger piece for turning said rock shaft.

4. In a typewriting machine, the combination of a rock shaft, a set of feed roll hangers carried and turned by said rock shaft, a paper apron fixed to said rock shaft to turn therewith, a second set of feed roll hangers, a platen scale mounted for movement toward and away from the platen, means for moving the platen scale and said last mentioned feed roll hangers away from the platen when said first mentioned feed roll hangers are moved away from the platen, and a finger piece for turning said rock shaft.

5. In a typewriting machine, the combination of a rock shaft, a set of feed roll hangers carried and turned by said rock shaft, a paper apron fixed to turn with said rock shaft, a second set of feed roll hangers, means for moving the last mentioned feed roll hangers away from the platen when said first mentioned feed roll hangers are moved away from the platen, a spring for connecting a hanger of one set with a hanger of the other set and for forcing both hangers toward the platen, and a finger piece for turning said rock shaft.

6. In a typewriting machine, the combination of a rock shaft, a set of feed roll hangers carried and turned by said rock shaft, a paper apron fixed to turn with said rock shaft, a second set of feed roll hangers, a platen scale mounted for movement toward and away from the platen, means for moving the platen scale and said last mentioned feed roll hangers away from the platen when said first mentioned feed roll hangers are moved away from the platen, a spring for connecting a hanger of one set with a hanger of the other set and for forcing both hangers toward the platen, and a finger piece for turning said rock shaft.

7. In a typewriting machine, the combination of a platen frame comprising end plates which are connected by tie-rods and a rock shaft; hangers carried by one of said tie-rods; feed rolls carried by said hangers; a second set of hangers carried by said rock shaft; feed rollers carried by said last mentioned hangers; a finger piece for turning said rock shaft; and means whereby the turning movement of the rock shaft is effective to move the hangers on the rock shaft and the hangers on the tie-rod away from the platen.

8. In a typewriting machine, the combination of a platen frame comprising end plates which are connected by tie-rods and a rock shaft; a paper table carried by said rock shaft; a paper apron carried by the rock shaft; rear feed rollers; hangers for said

rear feed rollers, which hangers are likewise carried by the rock shaft; forward feed rollers; hangers therefor, which hangers are carried by one of the tie-rods; means for turning the rock shaft; and means whereby the turning of the shaft is effective to move the hangers for both the front and rear feed rollers away from the platen.

9. In a typewriting machine, the combination of a platen frame comprising end plates connected by tie-rods and a rock shaft; a cylindrical platen carried by said platen frame; a paper table carried by said rock shaft; feed roll hangers which are likewise carried by the rock shaft; rear feed rollers carried by said hangers; separate hangers carried by one of said tie-rods; forward feed rollers carried by said last mentioned hangers; a spring connected at one end to a hanger of the rear feed rollers and connected at its opposite end to a hanger at the forward feed rollers; a platen scale carried by one of said tie-rods; means for effecting a turning movement of the rock shaft; and means whereby the turning of the rock shaft is effective to move both forward and rear feed rollers and the platen scale away from the platen.

10. In a typewriting machine, the combination of a cylindrical platen, a platen frame comprising end plates connected by a rock shaft and tie-rods, a brace plate carried by said tie rods and rock shaft intermediate the ends of the platen frame, said brace plate being recessed for cooperation with the tie-rods and rock shaft to brace them, and paper feed devices carried by said tie-rods and rock shaft.

11. In a typewriting machine, the combination of a cylindrical platen, a platen frame comprising end plates connected by a rock shaft and tie-rods, a brace plate intermediate the ends of the platen frame, said brace plate being recessed for cooperation with the tie-rods and rock shaft to brace them, paper feed devices carried by said tie-rods and rock shaft, a finger piece for turning said rock shaft, and means whereby a turning movement of the rock shaft is effective to simultaneously release the paper feed devices carried by the rock shaft and by said tie-rods.

12. In a typewriting machine, the combination of a cylindrical platen, a platen frame comprising end plates connected by a rock shaft and tie-rods, a brace plate intermediate said end plates, said brace plate being recessed for cooperation with the tie-rods and rock shaft to brace them, rock shafts each of which is supported at one end by a bearing on the brace plate, and margin feed rollers which are individually adjustable along said last mentioned rock shafts.

13. In a typewriting machine, the com-

combination of a platen frame, a rock shaft carried thereby, independently movable spring actuated hangers carried by said rock shaft, feed rollers carried by said hangers, means whereby a turning movement of the rock shaft is effective to release the feed roll hangers, a finger piece for turning said rock shaft, a locking device cooperative with said finger piece to retain it in its actuated position, a spring which tends to move said locking device to the releasing position, and a finger piece on said locking device for moving it to the locking position.

14. In a typewriting machine, the combination of a cylindrical platen, a rock shaft, independently movable spring actuated feed roll hangers carried by said rock shaft, feed rollers carried by said hangers, crank arms fixed to turn with the rock and cooperative with said hangers to force them and the feed rollers away from the platen when the rock shaft is turned, an actuating arm on the rock shaft, a pivoted release lever, a link which connects said release lever with said actuating arm, a locking device cooperative with said lever to lock it in the actuated position, a spring which tends to move said locking device to the releasing position, and a finger piece on said locking device for moving it against the power of its spring and into locking engagement with the release lever.

15. In a typewriting machine, the combination of a cylindrical platen, a rock shaft, individually movable feed roll hangers carried by said rock shaft, rear feed rollers carried by said hangers, crank arms fixed to turn with the rock shaft and cooperative with said hangers to force them and the feed rollers carried thereby away from the platen when the rock shaft is turned, an actuating arm on the rock shaft, a pivoted release lever, a link which connects said release lever with said actuating arm, a locking device cooperative with said lever to lock it in the actuated position, a spring which tends to move said locking device to the releasing position, a finger piece on said locking device for moving it against the power of its spring and into locking engagement with the release lever, forward feed rollers, independently movable hangers which carry said forward feed rollers, a spring for connecting a hanger for the forward feed rollers with a hanger of the rear feed rollers to force both forward and rear feed rollers toward the platen, and means whereby a turning movement of the rock shaft to release the rear feed rollers is effective to release the forward feed rollers.

16. In a typewriting machine, the combination of a cylindrical platen; a platen frame therefor; and paper feeding devices constructed and arranged in separate units that may be added to or subtracted from for

platen frames of different lengths, the platen frame comprising end plates which are connected by tie-rods and a rock shaft, and the paper feeding devices being carried by and pivoted directly upon said rock shaft and tie-rods.

17. In a typewriting machine, the combination of a cylindrical platen; a platen frame therefor; and paper feeding devices constructed and arranged in separate units that may be added to or subtracted from for platen frames of different lengths, the platen frame comprising end plates which are connected by tie-rods and a rock shaft, and the paper feeding devices being carried by and pivoted directly upon said rock shaft and tie-rods, a finger piece for turning said rock shaft, and means whereby the turning movement of the rock shaft is effective to move said paper feeding devices away from the platen.

18. In a typewriting machine, the combination of a cylindrical platen; a platen frame therefor; and paper feeding devices constructed and arranged in separate units that may be added to or subtracted from for platen frames of different lengths, the platen frame comprising the end plates connected by a rock shaft and tie-rods; rear feed rollers, individually movable hangers for said feed rollers, said hangers being carried directly by the rock shaft and free to turn thereon, forward feed rollers, hangers therefor, the hangers for the forward feed rollers being carried directly by and pivoted on one of said tie-rods, means for turning said rock shaft, and means whereby the turning movement of the rock shaft is effective to move the hangers for the forward and rear feed rollers away from the platen.

19. In a typewriting machine, the combination of a cylindrical platen; a platen frame therefor; and paper feeding devices constructed and arranged in separate units that may be added to or subtracted from for platen frames of different lengths, the platen frame comprising end plates which are connected by tie-rods and a rock shaft, and the paper feeding devices comprising a paper table and paper apron which are supported by said rock shaft, feed roll hangers which are likewise carried by and directly pivoted on said rock shaft, rear paper feed rollers which are carried by said hangers, forward feed rollers, hangers for said forward feed rollers, said last mentioned hangers being pivoted directly on one of said tie-rods, a platen scale, and hangers for said platen scale, said platen scale hangers being pivoted directly upon one of said tie-rods.

20. In a typewriting machine, the combination of a cylindrical platen; a platen frame therefor; and paper feeding devices

constructed and arranged in separate units that may be added to or subtracted from for platen frames of different lengths, the platen frame comprising end plates which
 5 are connected by tie-rods and a rock shaft, and the paper feeding devices comprising a paper table and paper apron which are supported by said rock shaft, feed roll hangers which are likewise carried by and directly
 10 pivoted on said rock shaft, rear paper feed rollers which are carried by said hangers, forward feed rollers, hangers for said forward feed rollers, said last mentioned hangers being pivoted directly on one of said tie
 15 rods, a platen scale, hangers for said platen scale, said platen scale hangers being pivoted directly upon one of said tie rods, a finger piece for turning said rock shaft, and means whereby a turning movement of the
 20 rock shaft is effective to move the forward and rear paper feed rollers, the paper apron and the platen scale away from the platen.

21. In a typewriting machine, the combination of a carriage, a cylindrical platen carried thereby, a rock shaft, a paper finger fixed to turn with said rock shaft but adjustable along the shaft, a margin feed roller carried by the paper finger, a finger
 30 piece connected to the rock shaft for turning it, said finger piece having an extension, and a leaf spring adapted to bear against said extension to turn the rock shaft and apply the force of the spring to the paper
 35 finger and margin feed roller.

22. In a typewriting machine, the combination of a carriage, a cylindrical platen carried thereby, a rock shaft, a paper finger fixed to turn with said rock shaft but adjustable along the shaft, a margin feed
 40 roller carried by the paper finger, a finger piece connected to the rock shaft for turning it, said finger piece having an extension, and a leaf spring adapted to bear against said extension to turn the rock shaft and
 45 apply the force of the spring to the paper finger and margin feed roller, said spring having means cooperative with said extension to limit the turning movement of the
 50 rock shaft in one direction.

23. In a typewriting machine, the combination of a carriage, a cylindrical platen carried thereby, a rock shaft flat on the sides thereof, a paper finger bent at one end to
 55 form a bearing which conforms to the cross-section of the shaft so that the paper finger is connected to turn with the shaft but may be adjusted along the shaft, a margin feed roller carried by said shaft, a finger piece
 60 connected to said shaft to turn it, an extension on said finger piece, and a leaf spring that bears on said extension to turn the shaft to apply the force of said spring to the paper finger and margin feed roller.

24. In a typewriting machine, the combination of a platen, paper feed devices
 65 which cooperate therewith, a hanger which is in the nature of a lever of the first order for certain of said paper feed devices, an independent hanger which is in the nature
 70 of a lever of the third order for other of said paper feed devices, and a single spring connected to both of said hangers and exerting its force to move both of them toward the platen.
 75

25. In a typewriting machine, the combination of a platen, paper feed devices which cooperate therewith, a hanger which
 80 is in the nature of a lever of the first order for certain of said paper feed devices, an independent hanger which is in the nature of a lever of the third order for other of said paper feed devices, a single spring connected to both of said hangers and exerting
 85 its force to move both of them toward the platen, and adjustable means by which said spring is connected to one of said hangers, whereby the force of the spring exerted on both of said hangers may be varied.
 90

26. In a typewriting machine, the combination of a platen frame comprising end plates united by tie-rods, a brace plate intermediate the end plates and parallel therewith, said brace plate cooperating with said
 95 tie-rods to brace them, a bearing carried by said brace plate, rock shafts each supported at one end by a bearing on an end plate and at its opposite end by the bearing carried by the brace plate, a paper finger carried by
 100 and mounted to turn with each rock shaft but adjustable along the shaft, a margin feed roller carried by each paper finger, a finger piece on each rock shaft; and a spring for each shaft effective to turn the shaft
 105 and apply its force to the associated paper finger and margin feed roller.

27. In a typewriting machine, the combination of a platen; a carriage therefor; and paper feed devices constructed and arranged in separate units that may be added
 110 to or subtracted from for carriages of different lengths, said paper feed devices comprising separate forward feed rollers, a divided shaft for said feed rollers, independently movable individually pivoted hanger
 115 arms therefor that may be pivoted at different points in the length of the carriage, separate springs for the different hanger arms, rear feed rollers, individually pivoted
 120 hanger arms therefor, which hanger arms may be pivoted at various points in the length of the carriage, and a divided shaft for said rear feed rollers.

28. In a typewriting machine, the combination of a platen; a platen frame therefor; and paper feed devices constructed and arranged in separate units that may be
 125

added to or subtracted from for platen frames of different lengths, said platen frame comprising end plates connected by a rock shaft and tie-rods, and said paper
5 feed devices comprising separate forward alined feed rollers, a divided shaft for said forward feed rollers, pivoted hangers for said feed rollers, said hangers being individually pivoted on one of said tie-rods so that
10 they may be located at varying positions along said rod, separate rear feed rollers, hangers therefor that are individually pivoted on said rock shaft so that they may be located at varying positions along said shaft, and a divided shaft for said rear feed rollers.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 21st day of February, A. D. 1912.

ARTHUR W. SMITH.

Witnesses:

E. M. WELLS,

CHARLES E. SMITH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."