March 20, 1928.

1,663,362

S. L. WALSOE

TYPEWRITING MACHINE

Filed Sept. 2 1926

3 Sheets-Sheet 1

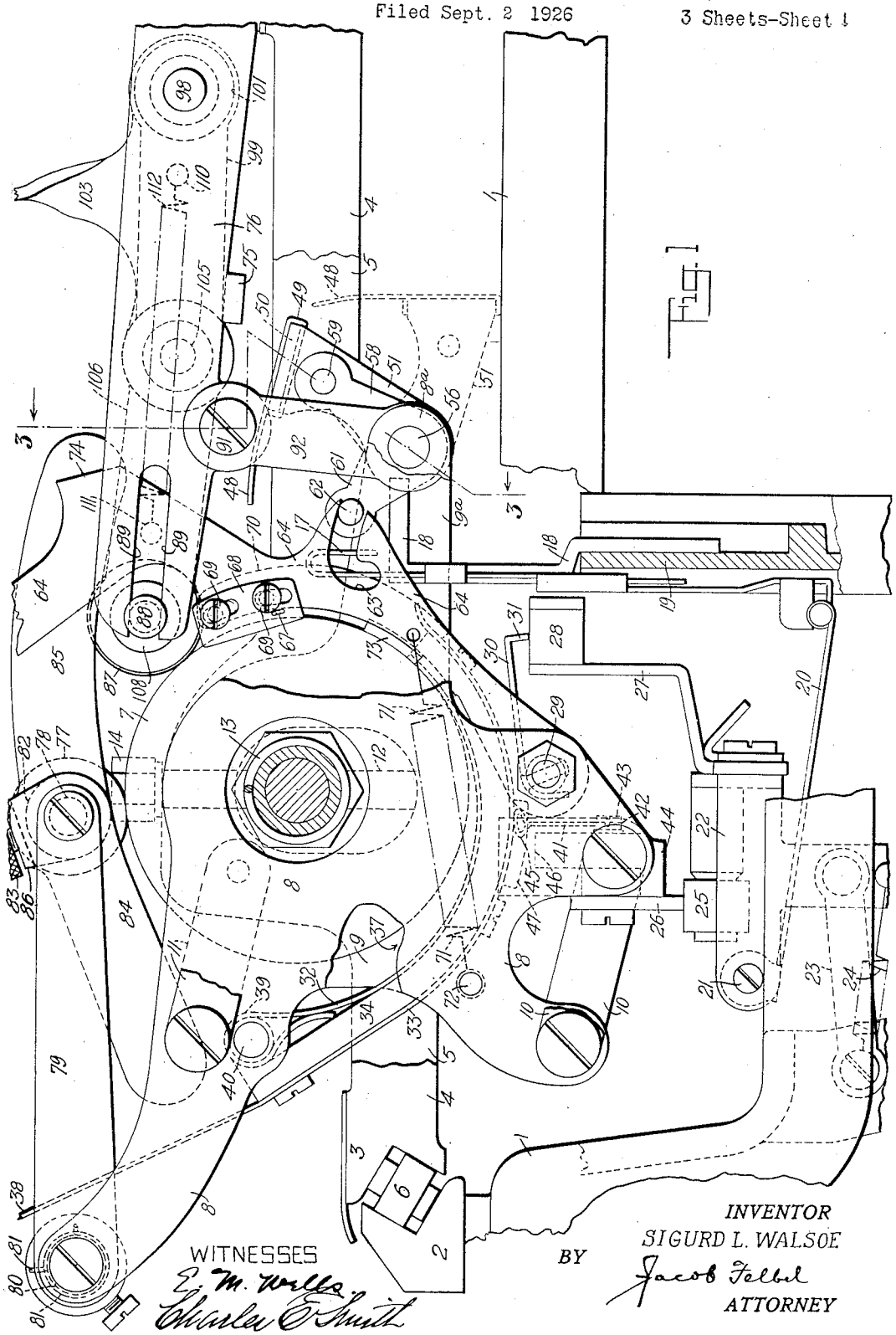


Fig. 1

WITNESSES

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March 20, 1928. 1,663,362

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TYPEWRITING MACHINE

Filed Sept. 2, 1926 3 Sheets-Sheet 2

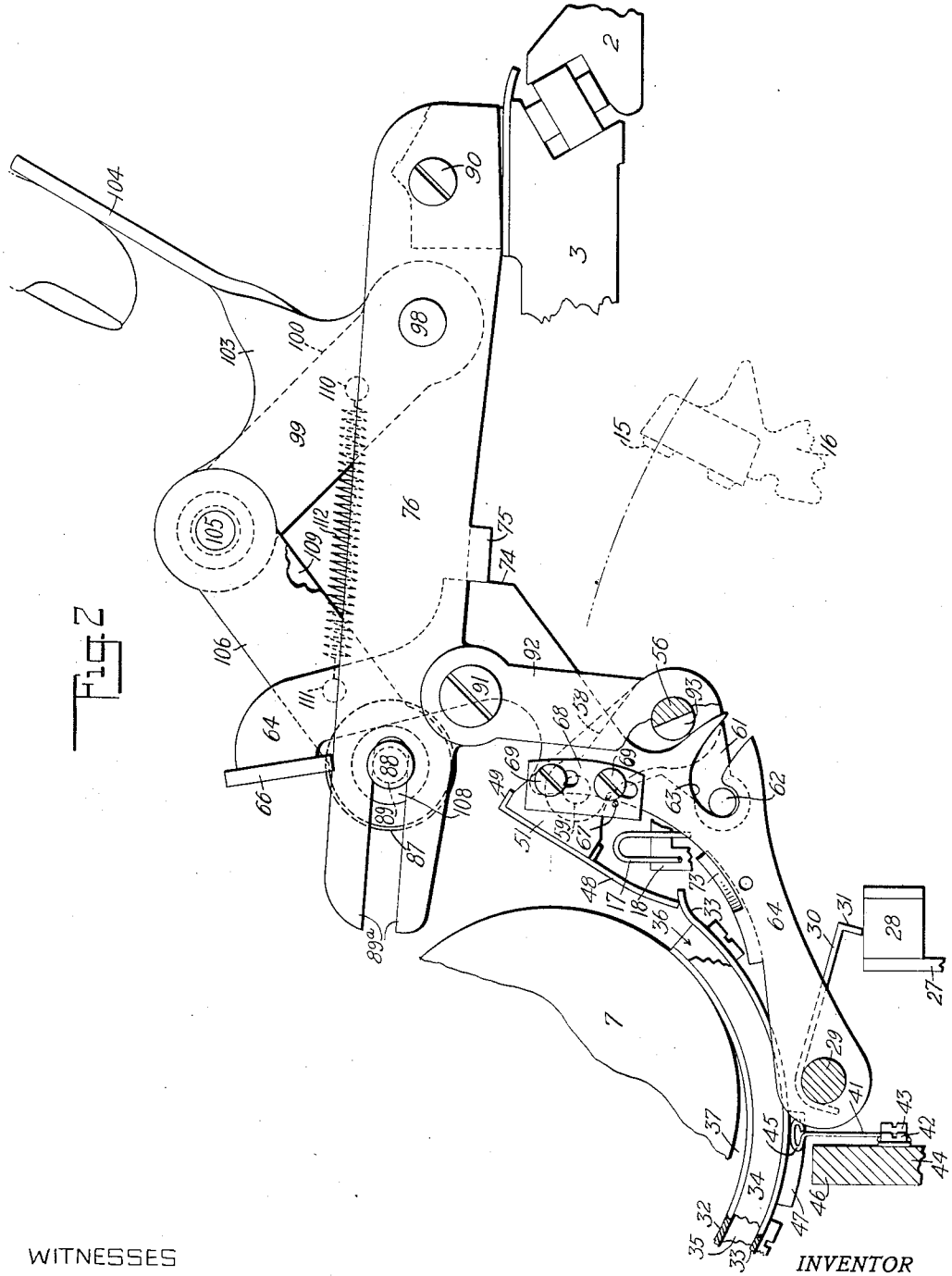


Fig 2

WITNESSES

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TYPEWRITING MACHINE

Filed Sept. 2, 1926. 3 Sheets-Sheet 3

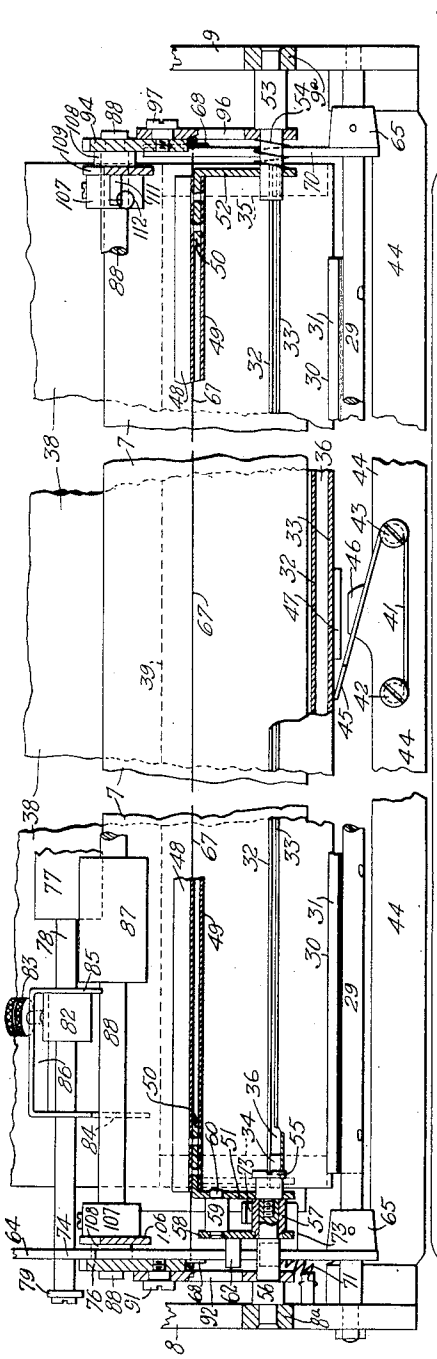


FIG. 3

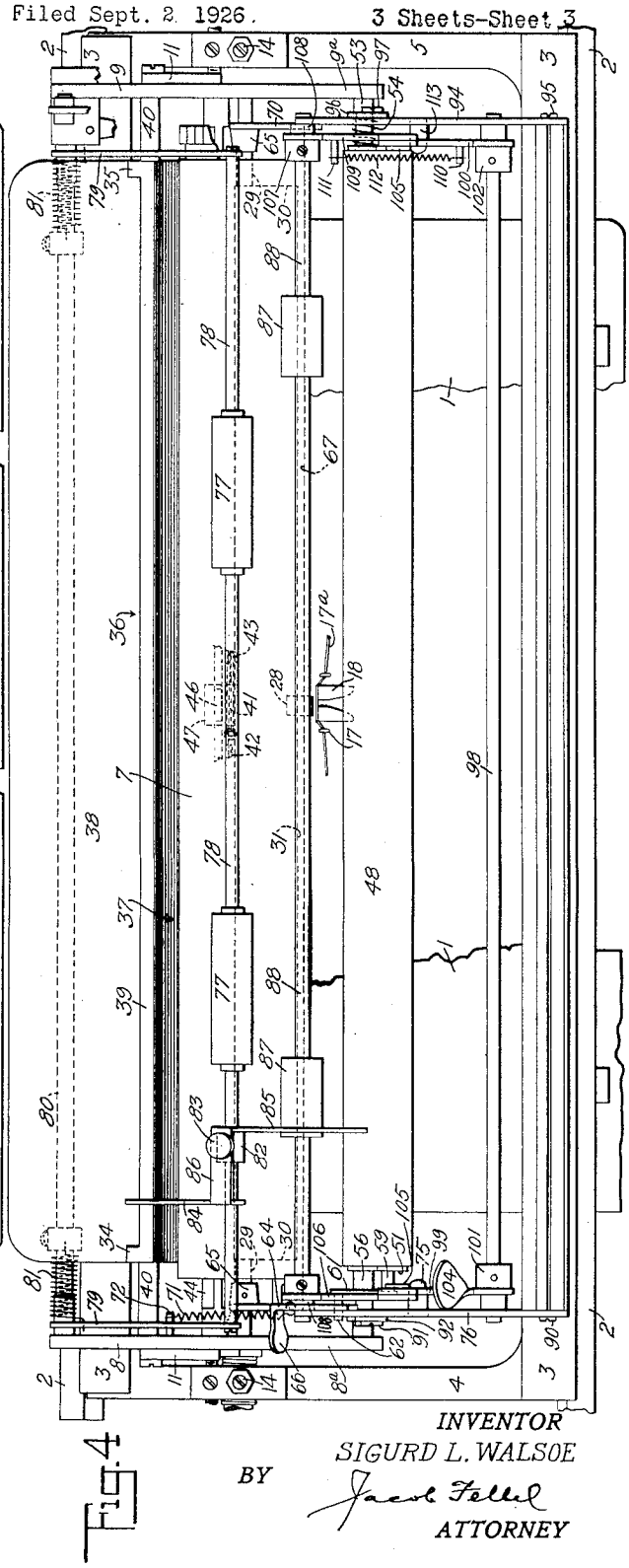


FIG. 4

WITNESSES

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Patented Mar. 20, 1928. 1,663,362

# UNITED STATES PATENT OFFICE.

SIGURD L. WALSOE, OF LYNDHURST, NEW JERSEY, ASSIGNOR TO REMINGTON TYPEWRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

## TYPEWRITING MACHINE.

Application filed September 2, 1926. Serial No. 133,228.

My invention relates to typewriting machines, and more particularly to billing mechanism therefor.

The present invention is in the nature of an improvement on the constructions disclosed in the following applications:

Frederick A. Hart, Serial No. 120,405, filed July 3, 1926, (now Patent 1,650,351, dated Nov. 22, 1927).

Walsoe and Hill, Serial No. 121,134, filed July 8, 1926, (now Patent 1,650,673, dated Nov. 29, 1927).

Cloyd E. Burns, Serial No. 122,239, filed July 13, 1926, (now Patent 1,647,854, dated Nov. 1, 1927).

The main object of the present invention is to provide improved paper feed-roller controlling-means and improved connections therefrom for controlling a shiftable paper deflector, line indicator and ribbon vibrator, and also for actuating said deflector, indicator and vibrator independently of said feed rollers.

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 designate corresponding parts in the different views:—

Fig. 1 is an enlarged, detail, fragmentary, side elevation, with parts broken away and in section, of a portion of one form of typewriting machine embodying my invention; the view showing the parts as they appear when the machine is in condition for writing.

Fig. 2 is a like view of the same showing the parts as they appear when the machine is conditioned to receive a work sheet introduced rearwardly and beneath the platen from the front thereof.

Fig. 3 is a transverse, vertical, sectional view taken on the line 3—3 of Fig. 1 and looking in the direction of the arrows at said line.

Fig. 4 is a top plan view of the machine with parts broken away and omitted.

The general purpose of the machine in which the improvements of the present invention are embodied, is much the same as in the machine disclosed in said previously filed applications. Said improvements are shown embodied in a Remington bookkeeping machine, Model #23, equipped with an automatic carriage return mechanism such as is shown in the patent to Frederick A. Hart #1,567,590, dated December 29, 1925, and also equipped with some of the devices of said previously filed applications. However, only so much of said machine, thus equipped, is disclosed in the accompanying drawings as is necessary to arrive at an understanding of my invention in its inclusion therein. It should be understood, however, that the present invention is not restricted to employment in the machines indicated above, but may be used in other combinations, and from certain aspects of the invention some of its features are of general application, as will hereinafter more clearly appear.

The machine including the present invention is capable of a wide range of uses and may be employed in various kinds of so-called billing operations where a plurality of work sheets are to be correlated in the machine and printed at a single operation. However, I do not deem it necessary to describe specifically the many different forms of billing operations in which the machine may be used. It is sufficient for the purpose of the present invention to describe in general terms one mode of so-called billing that may be successfully carried out with the aid of said machine, and perhaps briefly refer to some of the various other methods in connection with which the machine may be employed.

One method of using the machine which will be specifically referred to is its employment, for example, by a public service corporation such as, say, an electric or gas light company, for simultaneously, or at one writing, making out a bill and making corresponding entries on a record or register sheet which receives the entries written on all of the individual bill sheets. The record sheet and accompanying carbon sheet are first introduced into the machine. Means are provided for then quickly entering a bill, statement, or invoice sheet into the machine in front of the platen, and accurately positioning it in proper correlation with the previously introduced register sheet and the printing line. The entries may then be made on the bill sheet and these will be transferred through the interposed carbon sheet

to the register sheet. The bill sheet is then rapidly withdrawn from the machine without disturbing the register sheet, and another bill sheet may then be quickly introduced as before, and so on. Each line spacing operation, effected by the return of the carriage after writing one bill, carries the register sheet in position to receive a manifold copy of the next bill.

With the foregoing general explanation of the operation, I will proceed to describe the invention as it is embodied, in the present instance, in said hereinbefore mentioned Remington machine. The frame of the machine includes the usual top plate 1 supporting fixed guide rails 2. The carriage or truck comprises front and rear guide or cross bars 3 united by end bars 4 and 5. The guide rails 2 and cross bars 3 are oppositely grooved to receive crossed anti-friction rollers 6 by which the carriage is supported in the usual manner to travel from side to side of the machine over the top plate 1.

A cylindrical platen 7 is mounted in the usual manner in a platen frame comprising the rigidly connected end plates 8 and 9; the platen frame being connected to the carriage by the usual shift links 10 and 11. In the present instance, however, I contemplate writing only with upper case characters and the platen is, therefore, preferably held in the upper case position, this may be readily done by screwing up the lowermost case-shift limiting screw-stops 12, thereby holding the platen shaft, or the buffer springs 13 which surround it, against the upper-case limiting stops 14. This brings the printing line on the platen to a position where the uppermost types 15 on the usual type bars 16 will register therewith.

A ribbon vibrator 17 is mounted to slide up and down in the usual manner on a type bar center guide 18 secured to the type bar segment 19. The vibrator is actuated at each printing operation by the usual mechanism which includes an arm 20. Said arm is pivoted at 21 on a shiftable carrier or support 22 mounted on parallel links 23. A contractile spring 24 tends to lift the shiftable support 22 and causes an anti-friction roller 25 carried thereby to bear upward against the lower edge of a bar 26. This bar is secured to the carriage and extends substantially throughout the length thereof. In the usual Remington machines the purpose of this construction is to cause the ribbon vibrator to be shifted up and down with the platen in the case shifting movements of the latter. In the present construction there is no such case shifting movements of the platen but the construction, nevertheless, lends itself to the accomplishment of another result which will hereinafter appear.

As in the construction disclosed in said Walsoe and Hill previously filed application it is desirable when introducing a work sheet backwardly into the machine to lower the ribbon vibrator from its normal, Fig. 1, position. This is in order to enable the front paper deflector to be more conveniently moved to effective position, as shown in Fig. 2. In the present construction I have employed some of the same means that are disclosed in said Walsoe and Hill application for effecting this result, but have combined them in a somewhat different manner with the other coacting and related devices. Thus, as in the prior construction, a bracket arm 27 extends forward from the shiftable support 22 and carries an anti-friction roller 28 at the upper end thereof. A rock shaft 29 extends throughout the length of the carriage and is mounted at its ends in bearing openings in the end plates 8 and 9 of the platen frame. This rock shaft 29 carries a plate 30 which extends substantially throughout the length thereof and is bent down at its forward edge to form a flange 31 which coacts with the anti-friction roller 28. When the rock shaft 29, and the plate 30 carried thereby, are shifted by means to be hereinafter described from the Fig. 1 to the Fig. 2 position, the shiftable support 22 will be lowered against the power of its spring 24 effecting a corresponding lowering of the ribbon vibrator 17.

Coming now to the means for controlling and guiding the work sheets, it will be observed in the first place that there are no paper feed rollers employed beneath the platen, such rollers as are employed being located above the printing line; leaving the space beneath the platen free for the use of other devices.

There are two curved paper deflectors 32 and 33 employed beneath the platen, one arranged above the other and maintained spaced apart by intermediate spacing members or blocks 34 and 35 located near the ends thereof. Generally speaking, these deflectors conform to the curvature of the platen or are substantially concentric therewith and extend substantially throughout the length of the platen. As thus constructed there are two separate channels provided, one of which is the open channel 36 between the two deflectors and which is bounded at its ends by separating members 34 and 35, either or both of which may constitute side guides or gages for cooperation with a work sheet or sheets introduced into the channel 36. The other separated channel 37 is provided between the under surface of the platen and the upper deflector 32. The forward edge of the deflector 33 terminates in advance of the forward edge of the deflector 32, and has a slight downward curve in cross section. The deflector 33 is continued up at the rear to form an upwardly and rearwardly extending paper table 38 which

terminates at a considerable height above the platen. On the other hand, the deflector 32 terminates in the rear of the platen at a much lower point and below the top of the platen where it is bent to form a loop 39 that loosely surrounds a rod 40 fixedly connected at its ends to the end plates 8 and 9 of the platen frame. In this manner the rigidly united deflectors 32 and 33 are mounted on the rod 40 and have a slight pivotal movement thereon. A light wire spring 41 is connected by screws 42 and 43 to a cross bar 44 of the platen frame, the spring being anchored at one end on the screw 42 and coiled around the stem of the screw 43. The upper free end of the spring 41 is looped at 45 where it bears upward against the bottom of the deflector 33 and causes the forward edge portion of the deflector 32 normally to be lightly pressed against the platen or against the interposed work sheet. In this manner the sheets introduced from the rear of the platen through the channel 37 will be held snugly against the platen and the sheets introduced into the channel 36 will be prevented from entering the channel 37. By moving the upper end of the paper table forward, the forward end portions of the deflectors may be moved downward a limited distance, thus carrying the forward contact edge of the deflector 32 away from the platen, as provided for in the construction disclosed in the hereinbefore mentioned Hart application. In the present construction the downward pivotal movement of the united deflectors is limited by an upwardly projecting stop 46 on the cross bar 44 of the platen frame coacting with a metal stop 47 carried by the deflector 32 at the underside thereof.

In order to facilitate the backward introduction of the work sheets into the channel 36 from in front of the platen, there is provided a guide shield or paper deflector 48 that is movable on the carriage from a substantially horizontally disposed ineffective position, shown in full lines in Fig. 1, to a downwardly and rearwardly, inclined, effective position, shown in Fig. 2, and vice versa, as disclosed in said previously filed application.

The sheet metal deflector 48 which extends substantially throughout the length of the platen is bent under along one edge portion to form a looped or doubled portion 49 which extends throughout its length on the side thereof opposite its contact face forming an enclosed channel within the looped portion. In the open ends of the channel formed by the looped portion of the deflector are received oppositely directed ears or bent ends 50 which project inwardly from parallel sheet metal supporting arms 51 and 52 and are riveted to the deflector 48, as in the construction disclosed in the Walsoe and Hill application. These supporting arms 51 and 52 are pivotally mounted respectively on forwardly projecting arms $8^a$ and $9^a$ on the end plates 8 and 9 of the platen frame.

The arm 52 is loosely supported on an inwardly projecting shouldered pin 53 secured to the end plate 9 (see Fig. 3) and has a sliding, as well as a pivotal, movement on said pin. A coiled expansion spring 54 surrounds said pin and tends to force the arm 52 and the parts connected therewith to the left, for purposes which will presently appear. The arm 51 is supported on the shouldered bearing portion of a headed pivot screw 55, as shown in Fig. 3, for pivotal movement and also for axial movement along said pivot screw. The threaded end of this screw is received in a tapped opening in the end of a shouldered pin 56 secured to and projecting inwardly from the end plate 8 of the platen frame. Loosely supported on this same pin 56 intermediate a shoulder thereon and the end of the shouldered portion of the screw 65, is a hub 67 to which is riveted an actuating arm 58. The hub 57 and connected actuating arm 58 are therefore free to turn on the supporting pin 56 but are held against axial movement thereon. An inwardly projecting pin 59 is secured to the arm 58 and has a reduced portion 60 at the end thereof. This reduced end fits in an opening in the supporting arm 51 of the deflector 48. This connection between the arms 51 and 58 causes them to turn together and is normally maintained by the force exerted by the spring 54. The construction is such, however, that the deflector 48 may be shifted on its pivotal supports 53 and 55 against the force of the spring 54. At this time the connection between the arms 51 and 58 will be broken and the deflector 48 is free to drop forward and downward until arrested by the top plate 1, as shown in dotted lines in Fig. 1. The main purpose of thus disconnecting the deflector 48 from its actuating arm 51 and the means by which the latter is controlled, and moving the deflector to the dotted line Fig. 1 position, is to give access to the ribbon vibrator 17 for threading the ribbon $17^a$ therethrough.

In accordance with my present invention novel means by which the actuating arm 58 is controlled is as follows:

The arm 58 constitutes one arm of a bell crank lever, the other arm of which is indicated by the reference numeral 61. The arm 61 carries an outwardly projected connecting pin 62 that is received and works in a slotted cam 73 in an actuating arm 64. Said arm 64 is provided with a hub 65 (see Fig. 3) by which it is secured to the hereinbefore mentioned rock shaft 29. The character of the slotted cam and the construction and the

arrangement of the parts are such that a forward pivotal movement of the arm 64 from the Fig. 1 to the Fig. 2 position, causes a pivotal movement of the deflector 48 in the opposite direction, or rearwardly from its normally ineffective position. This brings the deflector 48 to the effective position, shown in Fig. 2, where it overlaps and virtually forms a continuation of the deflector 33. In this movement of the deflector 48 it passes from a position where it is out of the path of the type bars to a position where it is in the path thereof, and crosses the printing line, and where it is effective in directing work sheets introduced rearwardly from in front of the platen downward into the open channel 36. From thence the sheets in question pass around and beneath the platen to the rear thereof.

In the present instance the actuating arm 64 is provided with a finger piece 66 at the upper end thereof, whereby said arm and the parts controlled thereby may be actuated at will. The arm 64 also stands in cooperative relationship with means for controlling the shifting movement of certain of the feed rollers, to be automatically controlled thereby as will hereinafter clearly appear.

In the present construction the actuating arm 64 constitutes one of two supporting arms for a wire line-indicator 67. Said indicator extends longitudinally throughout the length of the platen and is adjustably connected to the arm 64 by a slotted plate 68 held in place on the arm 64 by headed binding screws 69, as disclosed in said Hart application. A second supporting arm 70 is secured to the rock shaft 29 near the opposite end thereof, said arm 70 being equipped with an adjustable plate corresponding to the plate 68 and to which the other end of the wire line-indicator is attached. A coiled contractile spring 71 is connected at one end to the arm 64 and at its opposite end to a pin 72 that projects inwardly from the end plate 8 of the platen frame.

In order to limit a motion of the arm 64 and the parts controlled thereby in one direction, said arm is formed with an inwardly extending ear or stop 73 which coacts with the surface of the platen near one end thereof and limits the rearward movement of the arm 64. The motion of the arm 64 in the opposite direction is limited by a stop projection 74 on said arm coacting with an inwardly projecting lug or stop 75 formed on a fixed supporting or guide arm 76, as shown in Fig. 2.

The paper feeding mechanism embodied in the present construction includes a plurality of line paper feed rollers 77 arranged to coact with the top of the platen and with work sheets introduced from the rear of the platen through the channel 37. Said feed rollers 77 coact with said sheets after the latter have passed above and beyond the printing line. The paper feed rollers 77, as shown in the present instance, are constructed and mounted in the same general manner as in said hereinbefore mentioned Hart application. Thus, the feed rollers are mounted for longitudinal adjustment along a supporting rod, spindle or bail 78 supported at its ends by forwardly extending arms 79 that are pivoted on a supporting rod 80 secured at its ends to the platen frame. Springs 81 exert their force against the arms 79 and thus cause the feed rollers 77 to bear against the platen or certain only of the work sheets thereon. By swinging the bail 78 upward and rearward the said feed rollers are released.

In the present construction I have provided a double side-edge paper-gage which is adjustable to different set positions along the bail or supporting rod 78. Thus a sleeve 82 is mounted on said rod 78 and is tapped to receive a thumb screw 83 by which the sleeve may be held in different positions to which it may be adjusted along the rod. A sheet metal member, comprising two parallel side edge contact portions 84 and 85, united by an integral cross piece 86, is secured to the sleeve 82. Each contact portion 84 and 85 is arranged in a plane that extends at right angles to the axis of the platen. One contact portion 84 extends rearward from the supporting rod 78 where it may coact with the left-hand side edges of work sheets introduced from the rear of the platen into the channel 37. On the other hand, the contact portion 85 extends forward from the rod 78 where it may coact with work sheets introduced from in front of the platen through the channel 36, in the event that neither of the spacing members 34 and 35 is available for use as a side-edge gage. The space that separates the contact portions 84 and 85 determines the extent of overlapping relationship between the two sheets or sets of sheets, whereas the adjustment of the double side edge gage along the rod 78 determines the positions of said sheets longitudinally of the platen. By mounting the double gage on the rod 78 as indicated, said gage does not interfere with the shifting of the rod and said rollers 77 towards and away from the platen, but is nevertheless readily available for use with both rearwardly and forwardly introduced work sheets. Moreover, the adjustment of the gages along the rod 78 may be effected without destroying the relationship between the two contact faces 84 and 85.

Aside from the side edge paper gages described above it should be understood that suitable paper end stops, such, for example,

as certain of the end stops described in said hereinbefore mentioned Burns application, may be employed. However, since a specific description of such end stops is unnecessary to arrive at an understanding of the present invention, further detail reference thereto will be omitted.

In the present machine I have embodied a novel construction of paper feed roller control and means by which the paper deflector 48, line indicator 67 and ribbon vibrator 17 are automatically controlled thereby, which will now be described.

A plurality of paper feed rollers 87, preferably two in number and in the nature of margin feed rollers, are mounted for adjustment along a supporting rod, bar or spindle 88. Any suitable means may be employed to retain said rollers in their adjusted position along the spindle 88, such for example, as the means disclosed in the said previously filed application of Walsoe and Hill. The spindle 88 is reduced at its ends where it is provided with circumferential grooves 89 in each of which is received parallel guide members $89^a$ of a supporting arm or guide member. One of the supporting arms is the guide arm 76 hereinbefore referred to, which at its front end is secured by a screw 90 to the carriage. The rear end portion of said arm is rigidly connected by a screw 91 to the upper end of a link 92, the lower end of which is supported on the inwardly projecting pin 56 on the platen frame. From an inspection of Fig. 2 it will be seen that one side of this pin is cut away at 93 to provide a clearance for that part of the arm 64 in which the cam slot 63 is formed. The arm 76 is thus rigidly supported on the platen frame and carriage, and consititutes a support and guide for one end of the spindle 88. A second corresponding supporting and guide arm 94 is provided for the opposite end of the spindle 88. Said arm 94 is connected at its forward end by a screw 95 with the carriage and is supported at the rear portion by a link 96 connected thereto by a screw 97. The lower end of this link is supported on the inwardly projecting pin 53, as shown in Fig. 3, and constitutes an abutment for the outer end of the spring 54 to bear against. The arm 94 supports and guides the spindle 88 in the same manner as the arm 76 for rectilinear bodily movement fore and aft of the machine above the printing line to move the feed rollers 87 in a like manner from the effective, Fig. 1, position to the ineffective, Fig. 2, position, and vice versa.

In order to control the above described movements of the feed rollers 87 I have provided a rock shaft 98 mounted at its ends in bearing openings in the arms 76 and 94. Two parallel crank arms 99 and 100 have their hubs 101 and 102, respectively, secured to the rock shaft 98 to cause said arms to rock with the shaft from the Fig. 1 to the Fig. 2 position, and vice versa. The arm 99 has an upwardly extending projection 103 that terminates in a finger piece 104 by which the rock shaft 98 and the parts connected therewith may be controlled. Each of the arms 99 and 100 is in the nature of a toggle arm or member, the arm 99 being pivoted at 105 to the forward end of its companion toggle link or member 106. The rear end of the toggle link 106 is apertured to receive the spindle 88. A collar 107 is secured on said spindle at one side of the link 106, whereas the spindle carries a washer 108 on the opposite side of said link, interposed between the link and the arm 76. The other toggle arm 100 is connected in a like manner with a toggle link 109, which in turn is connected with the spindle 88 in the same manner as the link 106, and the same reference numerals are employed to designate the corresponding parts of such connections. Laterally projecting pins 110 and 111 are carried by the toggle members 100 and 109 respectively, and to these pins are connected the opposite ends of a contractile spring 112. The construction and arrangement of the parts are such that when they are disposed as indicated in Fig. 1, the spring 112 exerts substantially a dead-center pull against the substantially dead-centered toggle members and is ineffective to withdraw the paper feed rollers 87 from contact with the platen or a work sheet thereon. When, however, a forward pressure is exerted by the operator on the finger piece 104 to break the toggle, said spring 112 exerts its force to complete the withdrawal of the feed rollers 87 to ineffective position, indicated in Fig. 2. On the other hand, when the operator moves the finger piece back from the Fig. 2 position, to the position indicated in Fig. 1, this results in straightening the toggles at both ends of the spindle 88 and applying the feed rollers 87 with a positively exerted force against the platen or a work sheet thereon. The toggle 99 and 106 is limited in this movement by the stop lug 75 which projects from the arm 76 into the path of the toggle arm 99. The toggle arm 100 also is limited in its movement by a corresponding stop lug 113 projecting inward from the supporting arm 94, as shown in Fig. 4.

I have referred to moving the toggle members to a substantially straight line position when applying the feed rollers 87. In practice I prefer when thus moving said feed rollers to arrest the toggle members after they have passed slightly over the straight line or dead-centered position, so as to hold the feed rollers 87 applied and prevent the reaction of the parts from accidentally releasing said feed rollers. They

will thus be retained applied indefinitely or until such time as the operator manually effects a preliminary breaking of the toggle from the Fig. 1 position, and enables the spring 112 to become effective to complete the movement of the feed rollers to the ineffective, Fig. 2, position.

Thus far I have described the means for moving the feed rollers into and out of contact with the platen without reference to the automatic control by such means of the line-indicator 67, the paper deflector 48 and the ribbon vibrator 17. The simple arrangement by which such automatic control is effected is to extend the actuating arm 64 into the path of the bodily movable spindle 88. Thus, it will be seen that said actuating arm extends up between the supporting arm 76 and the toggle link 106. As the parts move from the Fig. 1 to the Fig. 2 position, the washer 108 on the left-hand end of the spindle 88 will coact (after a preliminary extent of lost motion) with the actuating arm 64. This will result in automatically shifting the line indicator 67 to ineffective position, in shifting the deflector 48 to effective position and in lowering the ribbon vibrator out of the path of the said deflector, all as represented in Fig. 2. Such movements of the parts in question will have been effected by the time the stop projection 74 reaches the stop 75, as shown in Fig. 2, and arrests further movement of the parts.

It will be seen that while the parts referred to above are automatically actuated during the withdrawal of the feed rollers 87 from effective position, nevertheless by an actuation of the finger piece 66, the line indicator, deflector 48 and the ribbon vibrator may be moved independently of the feed rollers 87 from the Fig. 1 to the Fig. 2 positions and while the feed rollers remain applied to the platen.

The positive application of the feed rollers 87 in the manner described, as distinguished from the application of feed rollers by spring pressure, is productive of distinctly better results in the control of the work sheets with which said feed rollers coact. This feature is an important factor and its use is not restricted to a construction and combination such as that shown, but from the broader aspects of our invention it is of general application.

One example of the use of the present machine, such as has been hereinbefore referred to, is as follows:

A register sheet, which is to take the accumulation of the various bills to be written, and a corresponding carbon sheet (having its effective face next to the register sheet) are first introduced together from the rear of the platen through the channel 37, being positioned widthwise with the aid, say, of the side edge gage 84. At this time the parts may be disposed as indicated in Fig. 2. The leading ends of the register and its carbon sheet are then introduced beneath the paper feed rollers 77 and the sheets are adjusted in a line feed direction with the aid of the line indicator 67. This may be readily accomplished by moving the finger piece 104 rearward until the line indicator is in indicating position, which is attained before the feed rollers 87 are moved all of the way to effective position. After initially positioning the register sheet in the manner indicated, no further attention may be paid to it in the successive introduction, writing and withdrawal of the different bills. The register and associate carbon sheet having been initially positioned as indicated, a bill sheet on which is to be filled out the amount for, say, electricity or gas or both, consumed for a given month, is introduced from in front of the platen through the channel 36, the parts being first positioned, as indicated in Fig. 2, to facilitate the introduction of the bill sheet. The bill sheet thus introduced may be properly positioned widthwise of the machine and the register sheet with the aid of the side edge gage 85. Usually when the bill sheets are of uniform size, as supposed in the present instance, end stops such as are disclosed in the said Burns application are employed in the channel 36 to coact with the bottom end of each bill sheet to quickly and accurately position it to receive the first line of writing thereon. The finger piece 104 is then shifted to the rear, moving the parts controlled thereby from the Fig. 2 to the Fig. 1 position. This results in moving the line indicator to indicating position, in moving the deflector 48 out of the path of the type bars to ineffective position, in elevating the ribbon vibrator to normal position and in firmly clamping the bill sheet between the feed rollers 87 and the platen. When the bill is written the finger piece 104 is pulled forward, the bill sheet is withdrawn and a new bill sheet introduced and positioned as before, and so on. It will be understood that after writing each bill the carriage is automatically returned and the platen automatically line spaced, thereby spacing the platen to bring the register sheet in proper position to receive a manifold copy of the next bill written on the machine.

In substantially the same manner as that indicated above the machine may be employed as a check-writing machine, at which time the sheet described above as a "register sheet" would constitute a manifold record of the checks written and may constitute a "pay roll sheet".

Generally speaking, the sheet described above as a "register sheet" and which remains in the machine when the other sheets are removed and new ones inserted, may con-

stitute a "register sheet", a "proof sheet", a "sales sheet", a "distributing sheet", or a "pay roll sheet", depending on the use of the machine for different purposes.

In some instances the line indicator may be employed to position, in a line feed direction, each sheet introduced from in front of the platen into the channel 36 when it is not feasible, for one reason or another, to employ end stops. In such an event the machine may be manipulated as hereinbefore described in connection with adjusting the "register sheet" relatively to the printing line.

By the present invention I have provided a construction which has proved rapid of operation, highly efficient and reliable in use, which is compact and comparatively simple in construction and can be manufactured at comparatively small cost and be readily embodied in existing Remington machines without modifying, or materially modifying, the existing structural features of said machine.

Various changes may be made in the construction and certain 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 machine, the combination of a platen; paper feed rollers; a spindle on which said feed rollers are mounted; means for guiding said spindle to receive a shifting movement towards and from the platen for shifting the feed rollers into and out of contact therewith; and manually controlled means for shifting said spindle, said manually controlled means comprising a toggle coacting with each end of the spindle, a finger piece, and connections therefrom for simultaneously straightening both toggles to apply the feed rollers.

2. In a typewriting machine, the combination of a platen; paper feed rollers; a spindle on which said feed rollers are mounted; means for guiding said spindle to receive a shifting movement towards and from the platen for shifting the feed rollers into and out of contact therewith; and manually controlled means for shifting said spindle, said manually controlled means comprising a toggle coacting with each end of the spindle, a finger piece, connections therefrom for simultaneously straightening both toggles to apply the feed rollers, and means for retaining said toggles substantially in their straight line positions to hold the feed rollers applied.

3. In a typewriting machine, the combination of a carriage, a platen carried thereby, paper feed rollers, a spindle on which said feed rollers are mounted, guides on said carriage by which said spindle is mounted for bodily rectilinear movement towards and from the platen, a toggle at each end of said spindle controlling its movement, a rock shaft on which one member of each toggle is fixed to control the action of the toggles and a finger piece for turning said rock shaft.

4. In a typewriting machine, the combination of a carriage, a platen carried thereby, paper feed rollers, a spindle on which said feed rollers are mounted, guides on said carriage by which said spindle is mounted for bodily rectilinear movement towards and from the platen, a toggle at each end of said spindle controlling its movement, a rock shaft on which one member of each toggle is fixed to control the action of the toggles, a spring which tends to draw the companion arms of each toggle together, and a finger piece operatively connected to said toggles to straighten them against the force of said spring and apply the feed rollers to the platen with a positive pressure when the toggles are straightened.

5. In a typewriting machine, the combination of a carriage, a platen carried thereby, means carried by the carriage and including a deflector that crosses the printing line for guiding work sheets introduced from in front of the platen downwardly and rearwardly past the printing line and beneath and around the platen, paper feed rollers which coact with the platen above the printing line and are mounted for rectilinear shifting movement fore and aft of the machine into and out of contact with the platen and when shifted to the thrown-off position away from the platen give access to said work sheet guiding means to receive work sheets introduced rearwardly and downwardly from in front of the platen, and manually controlled means including a toggle for simultaneously shifting said feed rollers as stated and applying them to the platen by a straightening of said toggle.

6. In a typewriting machine, the combination of a carriage, a platen carried thereby, means carried by the carriage for guiding work sheets introduced from in front of the platen downwardly and rearwardly beneath and around the platen, said means including a paper deflector shiftable from a normally ineffective to an effective position, paper feed rollers which coact with the platen above the printing line and are mounted for rectilinear shifting movement fore and aft of the machine into and out of contact with the platen or the paper thereon, means for shifting said rollers as stated and when they are in effective position applying a positively exerted pressure against the platen, and means controlled by said feed-roller shifting-means for automatically controlling said paper deflector.

7. In a typewriting machine, the combination of a carriage, a platen carried thereby, means carried by the carriage for guid-

ing work sheets introduced from in front of the platen downwardly and rearwardly beneath and around the platen, a printing line indicator shiftable to and from indicating position, paper feed rollers which coact with the platen above the printing line and are mounted for rectilinear shifting movement fore and aft of the machine into and out of contact with the platen or the paper thereon, means for shifting said feed rollers as stated and when they are in the effective position applying a positively exerted pressure against the platen, and operative connections between said feed-roller shifting-means and line indicator to control the latter by the shifting of the feed rollers.

8. In a typewriting machine, the combination of a carriage; a platen carried thereby; means carried by the carriage for guiding work sheets introduced from in front of the platen downwardly and rearwardly beneath and around the platen, said means including a normally ineffective paper deflector that is shiftable to effective position; a ribbon vibrator; paper feed rollers which coact with the platen above the printing line and are mounted for rectilinear shifting movement fore and aft of the machine into and out of contact with the platen and when shifted to the thrown-off position away from the platen give access to said work sheet guiding means; means for shifting said feed rollers as stated and for causing them to exert a positively applied pressure against the platen; and operative connections between said shifting means, ribbon vibrator and paper deflector for moving the vibrator out of the path of the deflector and for moving the deflector to effective position when said feed rollers are moved away from the platen.

9. In a typewriting machine, the combination of a carriage; a platen carried thereby; means carried by the carriage for guiding work sheets introduced from in front of the platen downwardly and rearwardly beneath and around the platen, said guiding means including a normally ineffective deflector shiftable across the printing line to effective position; feed rollers which coact with the platen above the printing line and are mounted for rectilinear shifting movement fore and aft of the machine into and out of contact with the platen; means for thus shifting said feed rollers including a toggle which when straightened causes the feed rollers to exert a positively applied pressure against the platen; and operative connections between said feed-roller shifting-means and said deflector to shift the latter to effective position when the feed rollers are shifted away from the platen.

10. In a typewriting machine, the combination of a platen; paper feed rollers; a spindle on which said feed rollers are mounted, means for guiding said spindle to receive a rectilinear shifting movement towards and from the platen for shifting the feed rollers into and out of contact therewith, manually controlled positively acting means for shifting said spindle and positively forcing the feed rollers in contact with the platen, a normally ineffective paper deflector shiftable to effective position where it will aid in guiding work sheets introduced rearwardly from in front of the platen, and operative connections between said manually controlled means and said deflector for controlling the shifting movement of the latter by the former.

11. In a typewriting machine, the combination of a platen; paper feed rollers; a spindle on which said feed rollers are mounted; means for guiding said spindle to receive a shifting movement towards and from the platen for shifting the feed rollers into and out of contact therewith; manually controlled means for shifting said spindle, said manually controlled means comprising a toggle coacting with each end of the spindle, a finger piece, connections therefrom for simultaneously straightening both toggles to apply the feed rollers; a normally ineffective paper deflector shiftable to effective position where it will aid in guiding work sheets introduced rearwardly from in front of the platen; and operative connections between said manually controlled means and said deflector for controlling the shifting movement of the latter by the former.

12. In a typewriting machine, the combination, a platen, paper feed rollers mounted to receive a rectilinear shifting movement towards and from the platen, means for thus shifting said feed rollers comprising a toggle which in substantially the straight line position forces said feed rollers against the platen, a line indicator shiftable to and from indicating position, and operative connections between said feed roller shifting means and said line indicator whereby a shifting movement of one will control the shifting movement of the other.

13. In a typewriting machine, the combination of a platen; paper feed rollers mounted to receive a rectilinear shifting movement towards and from the platen; means for thus shifting said feed rollers comprising a toggle which in substantially the straight line position forces said feed rollers against the platen; a line indicator shiftable to and from indicating position; a normally ineffective paper deflector shiftable to effective position where it will aid in introducing work sheet rearwardly from in front of and beneath the platen; and operative connections between said feed roller shifting means, line indicator and paper deflector for controlling the shifting of the line indicator and deflec-

tor by the shifting of said feed-roller shifting-means.

14. In a typewriting machine, the combination of a platen, a plate-like paper deflector shiftable across the printing line to and from effective position and which when in the effective position aids in guiding work sheets introduced rearwardly from in front of the platen downwardly and rearwardly beneath the same, a pin connected with said deflector, and a separate manually controlled actuating arm having a cam slot therein in which said pin is received and works to control said deflector.

15. In a typewriting machine, the combination of a platen, a paper deflector shiftable to and from effective position and which when in the effective position aids in guiding work sheets introduced rearwardly from in front of the platen downwardly and rearwardly beneath the same, a pin connected with said deflector, a separate manually controlled arm having a cam slot therein in which said pin is received for controlling said deflector, and a line indicator shiftable to and from indicating position and carried in part by said arm, whereby a shifting of said arm controls a shifting movement of the line indicator as well as the deflector.

16. In a typewriting machine, the combination of a platen, a pivoted paper deflector shiftable to and from effective position and which when in the effective position aids in guiding work sheets introduced rearwardly from in front of the platen downwardly and rearwardly beneath the same, a pin connected with said deflector, and a manually controlled arm having a cam coacting with said pin to effect a pivotal movement of the deflector in a direction opposite to that given said arm, so that when said arm is moved away from the platen the deflector will be moved towards the platen.

17. In a typewriting machine, the combination of a platen, a pivoted paper deflector shiftable to and from effective position and which when in the effective position aids in guiding work sheets introduced rearwardly from in front of the platen downwardly and rearwardly beneath the same, a pin connected with the said deflector, a manually controlled arm having a cam coacting with said pin to effect a pivotal movement of the deflector in a direction opposite to that given said arm, so that when said arm is moved away from the platen the deflector will be moved towards the platen, and a line indicator carried in part by said arm and shifted thereby away from indicating position when said deflector is shifted to effective position.

18. In a typewriting machine, the combination of a platen, a pivoted paper deflector shiftable to and from effective position and which when in the effective position aids in guiding work sheets introduced rearwardly from in front of the platen downwardly and rearwardly beneath the same, a pin connected with said deflector, a manually controlled arm having a cam coacting with said pin to effect a pivotal movement of the deflector in a direction opposite to that given said arm, so that when said arm is moved away from the platen the deflector will be moved towards the platen, paper feed rollers shiftable into and out of contact with the platen, and means controlled by the shifting movement of said feed rollers for actuating said arm.

19. In a typewriting machine, the combination of a platen, a pivoted paper deflector shiftable to and from effective position and which when in the effective position aids in guiding work sheets introduced rearwardly from in front of the platen downwardly and rearwardly beneath the same, a pin connected with said deflector, a manually controlled arm having a cam coacting with said pin to effect a pivotal movement of the deflector in a direction opposite to that given said arm, so that when said arm is moved away from the platen the deflector will be moved towards the platen, paper feed rollers shiftable into and out of contact with the platen, and means controlled by the shifting movement of said feed rollers for actuating said arm, said arm, however, being shiftable independently of the shifting of the feed rollers to provide for an independent control of the deflector.

20. In a typewriting machine, the combination of a platen, a pivoted paper deflector shiftable to and from effective position and which when in the effective position aids in guiding work sheets introduced rearwardly from in front of the platen downwardly and rearwardly beneath the same, a pin connected with said deflector, a manually controlled arm having a cam coacting with said pin to effect a pivotal movement of the deflector in a direction opposite to that given said arm, so that when said arm is moved away from the platen the deflector will be moved towards the platen, a line indicator carried in part by said arm and shifted thereby away from indicating position when said deflector is shifted to effective position, paper feed rollers shiftable into and out of contact with the platen, and means controlled by the shifting movement of said feed rollers for actuating said arm, said arm, however, being shiftable independently of the shifting of the feed rollers to provide for an independent control of the deflector and line indicator.

21. In a typewriting machine, the combination of a platen, a pivoted paper deflector shiftable to and from effective position and which when in the effective position aids in guiding work sheets introduced rearwardly from in front of the platen downwardly

and rearwardly beneath the same, a pin connected with said deflector, a manually controlled arm having a cam coacting with said pin to effect a pivotal movement of the deflector in a direction opposite to that given said arm, so that when said arm is moved away from the platen the deflector will be moved toward the platen, a ribbon vibrator mounted for shifting movement out of the path of said deflector, and means controlled by said arm for thus shifting said vibrator.

22. In a typewriting machine, the combination of a platen, a pivoted paper deflector shiftable to and from effective position and which when in the effective position aids in guiding work sheets introduced rearwardly from in front of the platen downwardly and rearwardly beneath the same, a pin connected with said deflector, a manually controlled arm having a cam coacting with said pin to effect a pivotal movement of the deflector in a direction opposite to that given said arm, so that when said arm is moved away from the platen the deflector will be moved towards the platen, paper feed rollers, a spindle on which said feed rollers are mounted, and guides by which said spindle is mounted for bodily rectilinear movement towards and from the platen, a movement of said spindle being effective to actuate said arm to automatically control the shifting of said deflector.

23. In a typewriting machine, the combination of a platen, a pivoted paper deflector shiftable to and from effective position and which when in the effective position aids in guiding work sheets introduced rearwardly from in front of the platen downwardly and rearwardly beneath the same, a pin connected with said deflector, a manually controlled arm having a cam coacting with said pin to effect a pivotal movement of the deflector in a direction opposite to that given said arm, so that when said arm is moved away from the platen the deflector will be moved toward the platen, paper feed rollers, a spindle on which said feed rollers are mounted, and guides by which said spindle is mounted for bodily rectilinear movement towards and from the platen, said manually controlled arm being in the path of movement of said spindle to automatically actuate the arm by the spindle without however interfering with the actuation of the arm independently of the spindle.

24. In a typewriting machine, the combination of a platen, paper feed rollers shiftable into and out of contact with the platen, means for thus shifting the feed rollers including a toggle which when straightened applies the feed rollers to the platen with a positive pressure, and means for arresting said toggle substantially in the dead centered or straight-line position to hold the feed rollers against the platen.

25. In a typewriting machine, the combination of a platen, a set of paper feed rollers, a spindle on which said feed rollers are mounted, the spindle being movable to carry the feed rollers into and out of contact with the platen, a carrier adjustable along said spindle, a side edge paper gage projecting from said carrier forward of said spindle, and a second side edge paper gage projecting from said carrier rearward of said spindle.

26. In a typewriting machine, the combination of a platen, a set of paper feed rollers shiftable into and out of contact with the platen, and means for thus shifting said feed rollers comprising a toggle, the members of which are substantially in the straight-line dead center position when the feed rollers press against the platen, and a contractile spring connected at its ends to the members of said toggle and exerting substantially a dead center pull thereon when the members of the toggle are in the straight line position.

27. The combination of a platen; a paper feed roller; means for guiding said feed roller for shifting movement towards and from the platen into and out of contact therewith; and manually controlled means for shifting said feed roller comprising two pairs of toggle members, a finger piece, and connections therefrom for simultaneously straightening both pairs of toggle members to apply the feed roller.

28. The combination of a platen; a paper feed roller; a spindle on which said feed roller is mounted; means for guiding said spindle to receive a shifting movement towards and from the platen; and manually controlled means for shifting said spindle comprising two toggles operatively connected to the ends of the spindle, a finger piece, connections therefrom for simultaneously straightening both toggles to apply said feed roller to the platen, and means for retaining said toggles substantially in their straight line positions to hold the feed roller applied.

29. The combination of a carriage, a platen carried thereby, a paper feed roller, a spindle on which said feed roller is mounted, guiding means on the carriage by which said spindle is mounted for bodily rectilinear movement towards and from the platen, a toggle for each end of the spindle for controlling its movement, a rock shaft with which one member of each toggle is connected to turn, and a finger piece for turning said rock shaft.

30. The combination of a carriage; a platen carried thereby; means carried by the carriage for guiding work sheets introduced from in front of the platen downwardly and rearwardly beneath and around the platen, said guiding means including a normally ineffective deflector shiftable across the print-

ing line to effective position; feed rollers which coact with the platen above the printing line and are mounted for rectilinear shifting movement fore and aft of the machine into and out of contact with the platen; means for thus shifting said feed rollers including a toggle which when straightened causes the feed rollers to exert a pressure against the platen; and operative connections between said feed-roller shifting-means and said deflector to shift the latter to effective position when the feed rollers are shifted away from the platen.

31. The combination of a platen; a paper feed roller; a spindle on which said feed roller is mounted; means for guiding said spindle to receive a shifting movement towards and from the platen; manually controlled means for shifting said spindle comprising a toggle controlling each end of the spindle, a finger piece, connections therefrom for simultaneously straightening both toggles to apply the feed roller; a normally ineffective paper deflector shiftable to effective position where it will aid in guiding a work sheet introduced rearwardly from in front of the platen; and operative connections between said manually controlled means and said deflector for controlling the shifting movement of the latter by the former.

32. The combination of a platen, a paper feed roller mounted for sliding movement into and out of contact with the platen, means for thus shifting said feed roller including a pair of toggles which when straightened applies the feed roller to the platen, and means for arresting said toggles substantially in the dead centered or straight-line position to hold the feed roller against the platen.

33. The combination of a platen, a pivoted paper deflector shiftable to and from effective position and which when in the effective position aids in guiding work sheets introduced rearwardly from in front of the platen downwardly and rearwardly beneath the same, a pin connected with said deflector, a manually controlled arm having a cam coacting with said pin to effect a pivotal movement of the deflector in a direction opposite to that given said arm so that when said arm is moved away from the platen the deflector will be moved towards the platen, a spindle on which one or more paper feed rollers are mounted, guides by which said spindle is mounted for bodily rectilinear movement towards and from the platen, and manually controlled means for thus shifting the spindle and by the same movement actuating said arm to automatically control the shifting of said deflector.

34. The combination of a platen, a paper feed roller coacting with the platen above the printing line and mounted to receive a bodily sliding movement fore and aft of the machine out of and into contact with the platen, and manually controlled means for thus moving the feed roller comprising a pair of parallel toggles and a finger piece for simultaneously straightening both of said toggles to thereby apply the feed roller when said toggles reach a substantially straight line position.

35. The combination of a platen, a set of paper feed rollers coacting therewith above the printing line, and manually controlled means for moving said feed rollers in unison against the platen or away therefrom, said means comprising a plurality of toggles, a rock shaft with which one member of each toggle is fixed to rock, and a finger piece for rocking said shaft to simultaneously straighten all of said toggles and thereby apply the feed rollers to the platen when the toggles reach a substantially straight-line position.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 1st day of September, A. D. 1926.

SIGURD L. WALSOE.