E. B. HESS.

WRITING MACHINE.

APPLICATION FILED NOV. 27, 1907.

1,004,425.

Patented Sept. 26, 1911.

3 SHEETS—SHEET 1.

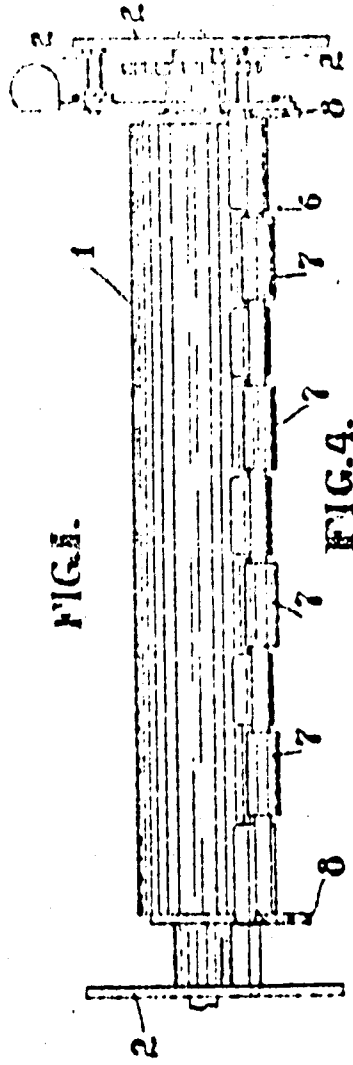

FIG. 1.

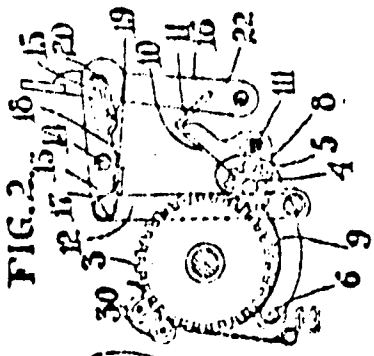

FIG. 2.

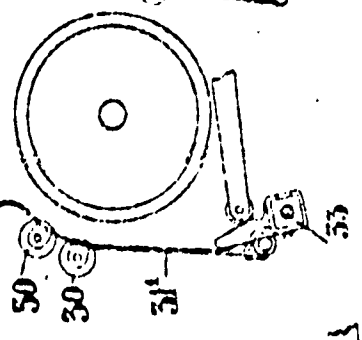

FIG. 4.

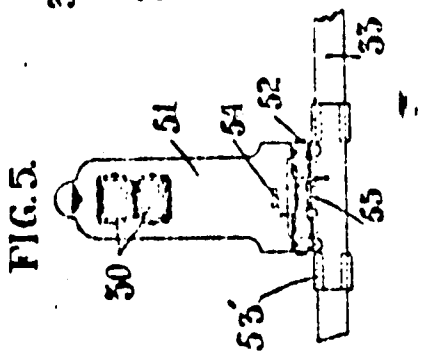

FIG. 5.

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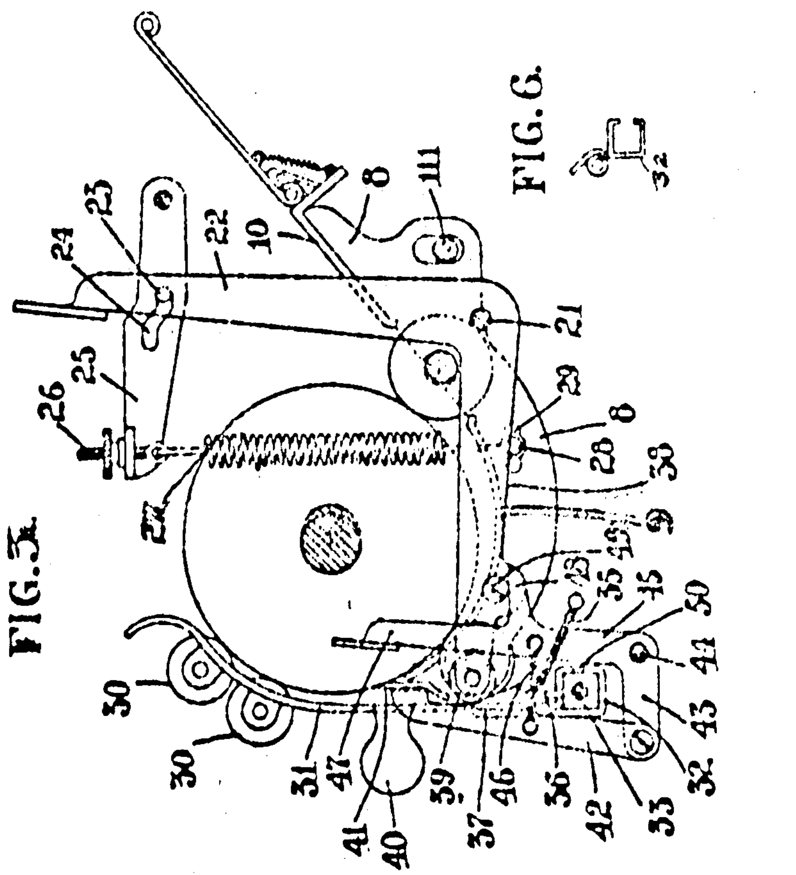
3 SHEETS—SHEET 2.



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3 SHEETS-SHEET 3.

FIG. 7.

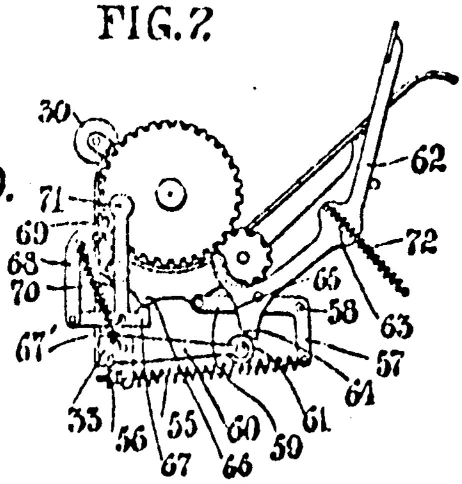


FIG. 9.

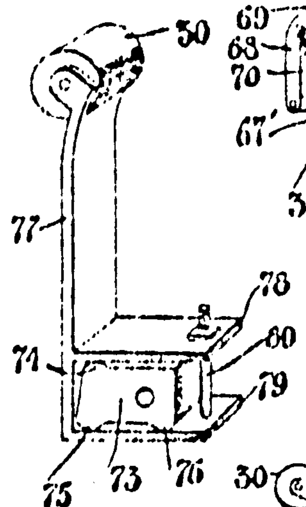
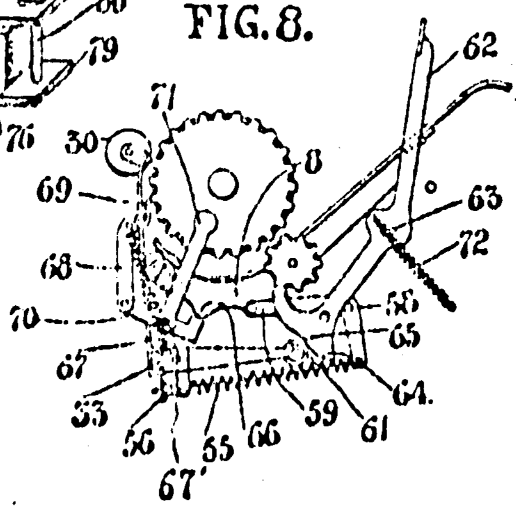


FIG. 8.



Attest:

Inventor:
Edward B. Hess
by Edward C. Davidson
Atty

1,004,425. WRITING-MACHINE. Edward B. Hess, New York, N. Y., assignor to Royal Typewriter Company, Hoboken, N. J., a Corporation of New Jersey. Filed Nov. 27, 1907. Serial No. 404,009.

To all whom it may concern:

Be it known that I, Edward B. Hess, a citizen of the United States of America, residing in the borough of Brooklyn, city and State of New York, have invented certain Improvements in Writing-Machines, of which the following is a specification.

This invention relates to paper feed devices adapted more particularly to "sight" machines of the class in which the type bars impinge upon the front face of the platen. In many such devices, heretofore devised, the ordinary front and rear feed rolls located below the axes of the platen, usually with the ordinary pan or paper guide between them, have been spring pressed toward the platen and provided with means for moving them against the tension of the spring supporting or sustaining means away from the platen to facilitate adjustment of paper in the machine or for the insertion of a plurality of sheets. In the operation of throwing off the feed devices or moving them against the tension of their supporting spring or springs considerable strain is imposed upon the parts and it has been necessary to make them relatively heavy adding thereby to the weight of the traveling carriage and to the cost of manufacture.

This invention comprises a novel organization wherein the feed roll sustaining means, of whatever character, may be released so that the rolls tend to fall away from the platen by the action of gravity. Ordinarily, and indeed, preferably the feed rolls will be spring supported, and as contemplated by this invention the sustaining spring or springs will not have tension imposed upon them in the operation of throwing off the feed devices.

The primary feature of this invention consists in moving the ordinary fixed point of support or abutment of the feed roll sustaining means or spring so that the feed devices may move away from the platen by the action of gravity. This feature of novelty may be embodied in many styles of spring sustained paper feed devices. I prefer to sustain the feed devices by pendant coiled springs whose upper ends are attached to movable supports that are lowered when the feed devices are thrown off. Such sustaining springs may, however, be arranged in a variety of ways as for instance horizontally. This invention, therefore, broadly considered, comprehends any appropriate way in which the described operation may be accomplished and is not dependent upon the form or character of the feed devices nor upon the particular kinds of springs nor particular arrangement thereof. The invention is broad enough to include arrangements in which the spring or springs are not coiled springs subjected to extension or compression. The spring may be of other forms and its support or abutment be moved to relieve its tension. In connection with such novel arrangement of sustaining springs, I prefer that their adjustment shall be such that when the machine is in normal condition for the reception of a sheet to be printed upon, the spring shall act merely as do non-compressible or non-extensible devices, such for instance as a mere link, to sustain the feed devices in proper relation to the platen. If the feed devices are suspended by pendant coiled springs these springs may be of such strength that they can act merely as links for the normal support of the paper feed devices being then under no spring tension or extension. Under such conditions a single sheet or two sheets of paper of ordinary thickness with interposed carbon may readily be carried through the machine by rotation of the platen without imposing any expansion or appreciable tension upon the supporting springs, there being sufficient elasticity of the surfaces of the rolls and platen. That such may be the operation, I have demonstrated by suspending the feed devices by solid links. When the springs are of the character stated and arranged as described, the insertion of an assemblage of sheets of increased thickness imposes upon the supporting spring a tension corresponding in a way with the thickness of the material inserted between the platen and the feed rolls. Experience has shown that with this arrangement the tension increases in proper relation to the inserted assemblage of sheets which will be properly carried around the platen by rotation thereof.

Paper feed devices constructed in accordance with the above suggestions have been shown by experience to be highly efficient in action and to possess the advantages suggested in the way of lightness of weight and economy of construction. The weight of the feed devices, even when they are made as light as feasible, is sufficient to cause them to fall away from the platen, no spring to draw them away being required.

In the present instance, I have shown the invention applied to an organization of paper feed devices resembling in some respects that disclosed in my Patent No. 861,978. There is a loosely mounted or floating frame carrying the front and rear feed rolls and paper guides, that is to say, the frame is capable of moving up and down with reference to the platen and of conforming thereto in contradistinction to being mounted to swing about a fixed axis.

In the accompanying drawings: Figure 1 is a front elevation showing the platen and such of the associated parts as are deemed desirable to illustrate this invention:

Fig. 2, a section on the line 2, 2, of Fig. 1: Fig. 3, a similar section on a larger scale showing a modified construction: Fig. 4, a detail view showing a margin clamp: Fig. 5, a front elevation of a laterally adjustable margin clamp: Fig. 6, a detail view of an adjustable slide that carries a margin clamp: Fig. 7, a section similar to Fig. 2 showing a modified construction: Fig. 8, a like view showing the feed devices thrown off: and Fig. 9, an enlarged detail view showing a means of adjusting the angular position of a margin clamp.

Referring first to Figs. 1 and 2, the platen 1 is properly mounted in side plates 2 and is provided at one end with a gear meshing with a pinion 4 on the shaft of the rear feed roll 5. 6 is the shaft of the front feed roll which is shown as divided into four sections 7. The feed roll shafts are mounted in suitable bearings in plates 8, 8, to which are connected the paper pan or guide 9 located intermediate the feed rolls. The frame plates 8 are extended upwardly and rearwardly beyond the rear feed roll and carry the feed table 10 which at its rear edge has a right angle flange 11 serving to stiffen the structure. The feeding devices are capable of movement toward and from the platen and are guided by pins 111 secured one in each side plate of the machine and extending into vertical slots in the end frame plates 8. A pendant link 12 is pivotally connected with the frame plate 8 located at the right hand end of the platen the point of connection being shown as located in front of the axis of the rear feed roll shaft. At its upper end the link 12 is pivotally connected to a horizontally disposed lever 13 pivoted intermediate its ends at 14 upon a pin projecting from the side plate 2. To the rear of this pivot, the lever 13 is formed with an elongated slot through which projects a pin 15 on a lever arm 16 pivoted at its lower end disposed in an upright position and provided at top with the usual finger piece. To a projection 17 on the lever 13 in front of its pivot 14 is secured a flat or plate metal spring 18 formed with two recesses 19 and 20. In normal working position the pin 15 lies in recess 20 and constitutes an abutment for that end of the spring. The reaction of the spring is such as to tend to lift the front end of the lever 13 and cause link 12 to sustain the feed devices with the rolls in contact or in very close juxtaposition to the surface of the platen. When the lever arm 16 is drawn forward, pin 15 passes to the recess 19 in the plate metal spring and permits the feed devices to drop away from the platen. The gears 3, 4, are so proportioned that the rear pressure or feed roll is driven at the same surface speed as the platen and the gears are of such depth that they do not pass out of engagement when the feed devices fall away from the platen. The spring 18 may be of such strength or stiffness and the feed devices comprising the table, pan, feed rolls and frame plates may be so light that in normal condition no flexure or spring tension is applied to the spring, it serving then as a mere lever to sustain the parts. Under these conditions, experience has demonstrated that a slight thickness as of one or two or three sheets or so may be run through the machine by the rotation of the platen without imparting to the spring 18 any flexure, or imposing any appreciable tension upon it. The introduction, however, of a plurality of sheets of substantial thickness (in making a number of manifold copies) will cause flexure of the spring owing to the fact that the rollers are now forced away from the surface of the platen by the thickness of the papers introduced. The spring may, however, be of such strength that it will be subjected to tension or flexure when the parts are in normal position. When the paper feed devices are thrown off, the abutment (pin 15) of the spring 18 is moved thereby permitting the forward end of lever 13 to drop. With a construction of this general character, the feeding devices may be made very light because there is no strong spring tension normally imposed upon them which will be increased materially when a substantial thickness of sheets passes between the platen and the rolls. I have found, therefore, that it is sufficient to have a supporting link 12 at one end of the platen only, although if desired a similar link may be placed at the left hand end of the platen in which case the pivots 14 would be a rock shaft extending between the side plates and having rigidly attached to it at one side the lever arm 13 and at the other side a radial arm corresponding exactly with the front portion of the lever 13.

In Fig. 3, the same general construction of feed devices, frame pieces 8, front and rear rolls, intermediate pan 9 and table is shown and as before the feed devices are guided vertically by pins 111 working in vertical slots in the end frame plates 8. The guide for the feed devices, may be located elsewhere; for instance, it may be in line with the axis of the rear feed rolls, the projecting ends of whose shafts might serve as members of the guide and work in guides formed in or on the side plates. Pivoted at the right hand side of the machine on an axis 21 is a bell crank lever whose vertical arm 22 is formed with a usual finger piece and carries a lateral pin 23 working in a slot 24 in a horizontally disposed lever arm 25 pivoted at its rear end and at its front end equipped with an adjustable vertically disposed eye bolt 26 connected with which is the upper end of a coiled spring 27 whose lower end is connected to the right hand

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side plate 8 of the frame of the feed devices. This latter connection may be effected by a clamping bolt 28 working in a horizontal slot 29 in the frame plate so that the exact point of application of the spring may be adjusted as desired and the relative pressure of the rear and front feed rolls upon the platen be determined. The slot 24 has end portions lying in different planes connected by an inclined part. When the hand lever 22 is in rearmost position as in Fig. 3, the effect is to hold the front end of the lever arm 25 in normal elevated position so that the spring 27 will maintain the rolls in contact with or in suitable juxtaposition to the face of the platen. As stated in connection with the construction illustrated in Fig. 2, this coiled spring may be of such strength that for such normal support of the feed devices and under conditions incident to the passage of a relatively thin amount of paper around the platen, the spring will act merely as a link: that is to say, it will not be subjected to any extension. But when a thicker mass of sheets is passed between the rolls and platen a tension will be imposed upon the spring by the marked separation of the feed roll from the surface of the platen. For adjustment of the paper in the machine the feed devices may be allowed to drop by gravity away from the platen merely by drawing the lever arm 22 forward, the pin 23 then passing into the front end of the slot 24 thereby lowering the front end of the lever arm 25, and permitting the feed devices to drop by gravity away from the platen. One spring 27 located at the end of the platen will afford satisfactory results although, of course, there may be a spring at each side of the platen, in which case the part 21 instead of being a short pin may then be a rock shaft extending across the machine to the left hand end of the platen where it is provided with an arm corresponding with that 22 and engaging a lever corresponding with that 25.

In both Figs. 2 and 3 margin paper clamps in the form of rollers are shown. There will, of course, be one at each side of the platen and each clamp consists of two rollers 30 arranged one ahead of the other in bearings in a curved arm 31 formed at the bottom as at 32 to embrace a square rock shaft 33 turning in the side plates of the carriage. A coiled spring 35 attached at one end to a fixed point and at the other to a pin 36 projecting upwardly from the square rock shaft tends to rock the shaft to draw the margin clamp rolls into engagement with the face of the platen. Extending upwardly from the square shaft 33 is a post 37 having its rear face inclined upwardly and forwardly. The horizontally disposed forwardly projecting arm 38 of the bell crank lever 22, 38, carries in its end a roll 39 that rides against the inclined rear face of the post 37 so that when the lever arm 22 is drawn forward to permit the feed devices to drop, roll 39 will overcome the tension of spring 35 thereby rocking the shaft 33 and carrying the margin clamp rolls away from the face of the platen. Projections or handles 40 may be placed upon the arms 31 to facilitate lateral adjustment of the arms which may be shifted sidewise on the squared shaft 33.

There is also shown in Fig. 3, a scale bar 41 normally standing about a letter space below the line of print. It is carried in the upper ends of two arms 42 one at each end of the platen. They are pivotally connected at their lower ends with arms 43 projecting forward from a rock shaft 44 and having vertical parts 45. Coiled springs 46 connect the vertical parts 45 and pivoted arms 42 and by their reaction tend to draw the scale bar into contact with the surface of the platen. The part 45 at the right hand end of the platen is prolonged upwardly forming a lever arm 47 provided with a usual finger piece and with a rearwardly projecting lug 48. On the side of the horizontally disposed arm 38 of the operating bell crank lever there is an eccentric adjustable projection 49 that overlies the lug 48. When the lever arm 22 is drawn forward, the horizontal arm 38 moves downwardly and by reason of engagement of the projection 49 with lug 48 lifts the scale bar to the printing line. Projections 50 on the parts 45 normally bear against square shaft 33 which acts as the abutment to sustain the pull of the springs 46.

In Fig. 2, the means for throwing off the margin rolls 30 are omitted. Fig. 4 shows rather diagrammatically the margin rolls thrown off. Fig. 5 shows a somewhat different construction with respect to the margin rolls. Here the roll or rolls for one of the margin clamps are carried in a plate 51 hinged at 52 to a slide 53' frictionally mounted on the square shaft 33. A coiled spring 53 applied at the hinge tends to urge the rolls 30 into engagement with the platen and a projection 54 on the sleeve 53 extending up in front of the arm or plate 51 and acts when the shaft 33 is rocked to move the plate 51 away from the platen.

Figs. 7 and 8 show a construction in which the paper feed devices are not suspended but are spring supported from below, means being provided for releasing the spring tension so that the feed devices may move away from the platen. In this construction, the rock shaft 33 has a lug on the bottom at the right hand end of the platen to which is connected a horizontally disposed coiled spring 55 adjustably connected with the lug by a screw bolt and nut 56. The rear end of this spring is connected with the downwardly extending arm 57 of a bell crank lever pivoted at 58 and having a forwardly extending hori-

zontally disposed arm 59 jointed at its end to the end frame plate of the frame of the paper feed devices. Projecting rearwardly from the rock shaft 33 is an arm 60 carrying in its end a roller 61 with which engages a cam face on the forward lower end or edge of a release lever 62 pivoted at 63. In normal position, the high part 64 of said cam face bears upon the roll 61 tending to throw the lug on the bottom of the square rock shaft forward thereby causing the spring 55 to elevate the arm 59 of the bell crank lever and hold the feed rolls in engagement with the platen. When the release lever is drawn forward, the cam face moves downward and roll 61 passes to the low face 65 thereof as indicated in Fig. 8 and the spring being released, the feed devices move or fall away by gravity to the release position shown in the latter figure. At the same time, the rocking of the shaft 33 throws off the margin rolls. A projection 66, on the lower edge of the side frame plate 8 engages one end of a lever arm 67 mounted intermediate its ends on a rock shaft 67′ and having hinged to its front end an upright arm 68 that carries the scale bar 69. A spring having one end attached to the arm 68 and the other to the rock shaft 33 tends by its reaction to draw the scale bar against the face of the platen. When the operation described occurs, the weight of the paper feed frame with its rolls exerted against the rear end of lever 67 will overcome the tension of the coiled spring 70 and will raise the scale bar to the printing line. At the other end of the platen there is a similar lever mounted on rock shaft 67′, a similar projection 66 on the edge of the frame plate, a similar spring 70 and arm 68 to which latter the end of the scale bar is attached. At the right hand side of the machine, a lever arm 71 is extended upwardly from the axis of the lever 67 and, by its manipulation, the scale bar may be moved from the line of print independently of the movement of the release lever 62. A coiled spring 72 applied to the release lever tends to hold the parts in norinal position and, when the release lever is drawn forward and the paper feed devices dropped, the spring passing the axis of the release lever tends to then hold the feed devices in off position.

Fig. 9 shows on a quite enlarged scale, means for adjusting the arms of standards that carry the margin roll 30 at each end of the platen. In this case, the rock shaft which is here marked 73 has formed in its front portion a longitudinal rib 74 on its upper face, a longitudinal rib 75 on its lower face and, on its rear portion, a longitudinal rib 76 on its lower face. The arm here marked 77 carrying the margin roll has projecting from it rearwardly at right angles at its lower portion, two parallel flanges or webs 78, 79 that extend beyond the rear of the rock shaft. A bolt 80 passes through the rear part of these two flanges and has applied to it an adjusting nut. By manipulating the nut, the angular positon of the arm 77 may be varied.

I claim:

1. In a writing machine, paper feed devices, a support therefor, spring means under tension serving by spring reaction to hold said support with the feed devices in normal operative position, and paper feed release devices operating to release said spring means from tension and thereby permit the feed devices to move freely to inoperative position.

2. In a writing machine, a platen, front and rear feed rolls located below the axis of the platen, supporting means carrying said rolls, spring means under tension serving by their reaction to hold said supporting means with the feed rolls in operative relation to the platen and paper feed release devices operating to release said spring means from tension and thereby permit the feed rolls to move freely to inoperative position.

3. In a writing machine, paper feed devices, their support, a suspending spring applied to the support and acting to hold the feed devices in operative position and paper feed release devices operating to release said suspending spring to permit the feed devices to move to inoperative position.

4. In a writing machine, a platen, paper feed devices comprising front and rear feed rolls located below the axis of the platen, spring means acting to suspend the feed rolls in operative relation to the platen and paper feed release devices operating to release said suspending means to permit the feed devices to move away from the platen.

5. In a writing machine, a platen, paper feed devices located below the platen, spring means by which the feed devices are suspended in operative relation to the platen and paper feed release devices operating to lower the point of support of said spring means to permit the feed devices to move away from the platen.

6. In a writing machine, paper feed devices comprising front and rear feed rolls located below the platen, spring means for suspending such devices with the rolls in operative relation to the platen and an adjustable means of connection between the suspending devices and the paper feed devices located between the front and rear feed rolls and means for lowering said spring suspending means.

7. In a writing machine, paper feed devices comprising front and rear feed rolls located below the platen, a coiled suspending spring attached at its lower end to the

paper feed devices and paper feed release devices comprising a movable support to which the upper end of said spring is attached, said paper feed release devices acting when operated to lower said support to permit the feed devices to move away from the platen.

8. In a writing machine, paper feed devices comprising front and rear feed rolls located below the platen, a coiled spring for suspending the feed devices attached at its lower end thereto intermediate the rolls, means by which said point of attachment may be adjusted nearer to or farther from the rear roll, a support to which the upper end of the spring is attached and means for lowering such support to permit the feed devices to move away from the platen.

9. In a writing machine, paper feed devices comprising front and rear feed rolls located below the platen, a coiled spring for suspending the feed devices attached at its lower end thereto intermediate the rolls, means by which said point of attachment may be adjusted nearer to or farther from the rear roll, a support to which the upper end of the spring is attached, means for lowering such support to permit the feed devices to move away from the platen and a vertical guide for the paper feed devices in their movement toward and away from the platen.

10. In a writing machine, paper feed devices comprising front and rear feed rolls located below the platen, a coiled spring for suspending the feed devices attached at its lower end thereto intermediate the rolls, means by which said point of attachment may be adjusted nearer to or farther from the rear roll, a support to which the upper end of the spring is attached, means for lowering such support to permit the feed devices to move away from the platen and a vertical guide located in rear of the rear feed roll for the paper feed devices in their movement toward and away from the platen.

11. In a writing machine, paper feed devices, a supporting spring therefor, a lever controlling the spring and means for, at will, rocking the lever to release the spring and permit the feed devices to move away from the platen without imposing tension upon the supporting spring.

12. Paper feed devices for a front strike writing machine comprising a frame, front and rear feed rolls carried thereby, a rock shaft, an arm extending forward therefrom at each end of the platen, means extending downward from said arms to said frame serving to suspend the frame, a pivoted lever arm and a projection therefrom engaging an inclined face on one of said arms, whereby the suspended frame may be lowered and raised by the manipulation of said lever arm.

13. Paper feed devices for a front strike writing machine comprising front and rear feed rolls, suspension springs attached at their lower ends to the frame of the feed devices and at their upper ends to movable supports, means for lowering said supports to effect movement of the feed rolls away from the platen, a scale bar normally below the line of print, means for moving it to the line of print when the feed rolls move away from the platen, and independent means for raising the scale bar to the line of print when the feed rolls are in contact with the platen.

14. Paper feed devices for a front strike writing machine comprising front and rear feed rolls, suspension springs attached at their lower ends to the frame of the feed devices and at their upper ends to movable supports, means for lowering said supports to effect movement of the feed rolls away from the platen, a scale bar normally below the line of print, means for moving it to the line of print when the feed rolls move away from the platen, and independent means for raising the scale bar to the line of print when the feed rolls are in contact with the platen, margin clamps and means for moving them away from the face of the platen when the feed devices are moved away from the platen.

15. In a writing machine, paper feed devices, spring means under tension serving by spring reaction to support the feed devices in proper relation to the platen and paper feed release devices comprising means for releasing said spring supporting means from tension and thereby permit the feed devices to move freely away from the platen and means for guiding the feed devices in their movement toward and from the platen.

16. In a writing machine, paper feed devices, spring means for suspending them in proper relation to the platen and paper feed release devices comprising means for releasing said spring suspending means to permit the feed devices to move away from the platen and means for guiding the feed devices in their movement toward and from the platen.

17. In a writing machine, paper feed devices comprising front and rear feed rolls located below the axis of the platen, spring means for suspending them in proper relation to the platen, paper feed release devices comprising means for releasing said spring suspending means to permit the feed devices to move away from the platen and means located in rear of the front feed roll for guiding the feed devices in their movement toward and from the platen.

18. In a writing machine, paper feed devices comprising a platen, front and rear feed rolls located below the platen and cooperating therewith, a coiled spring by

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which the feed devices are suspended, a movable support for the upper end of the coiled spring and means for lowering said support to permit the feed devices to fall away from the platen without disturbing the normal adjustment of said suspension spring and means for guiding the feed in their movement toward and from the platen.

In testimony whereof, I have hereunto subscribed my name.

EDWARD B. HESS.

Witnesses:
JOHN M. LEE,
E. F. WICKS.