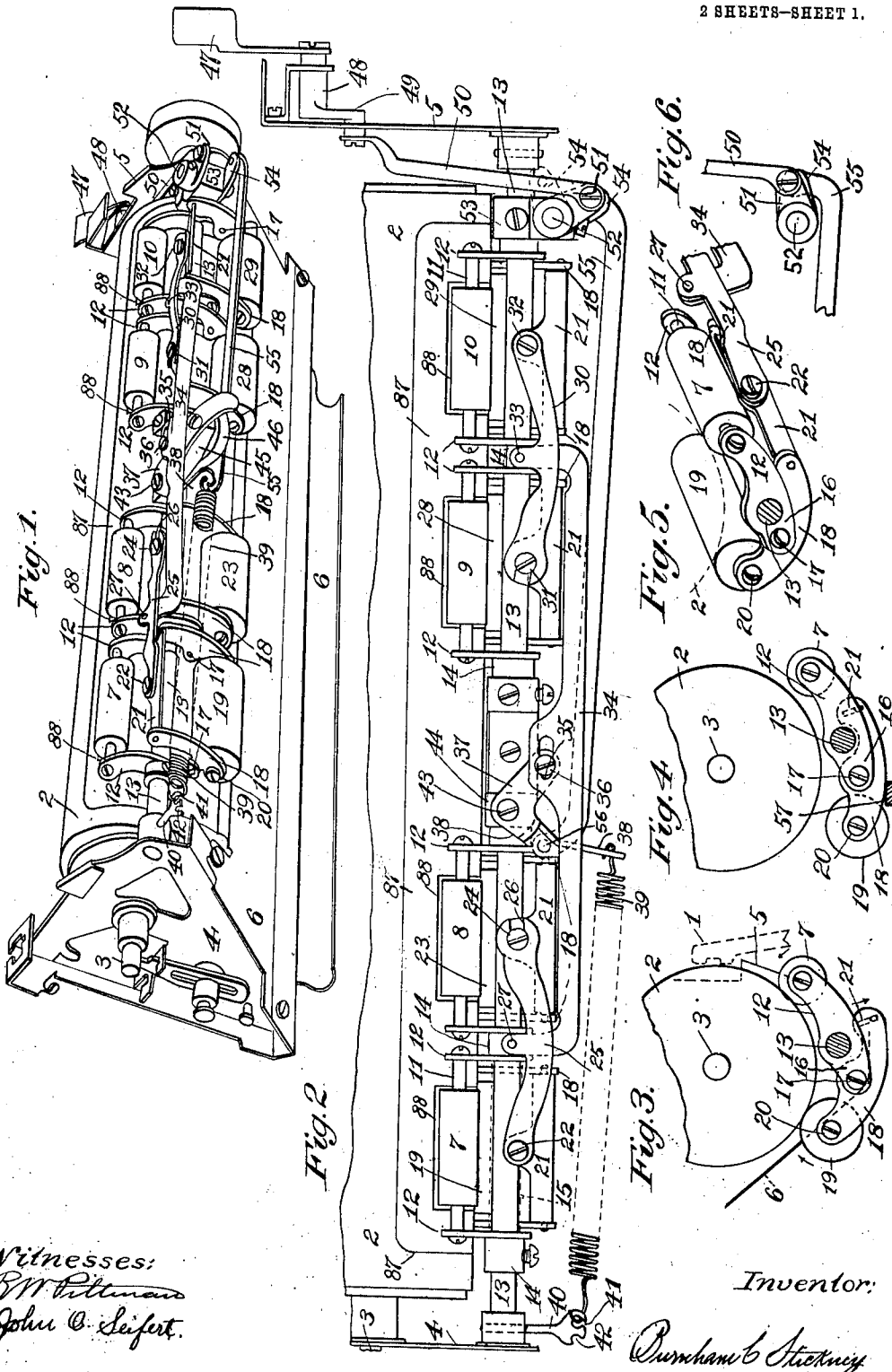


1,055,367.

Patented Mar. 11, 1913.

2 SHEETS-SHEET 1.



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B. C. STICKNEY.
TYPE WRITING MACHINE.
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1,055,367.

Patented Mar. 11, 1913.

2 SHEETS—SHEET 2.

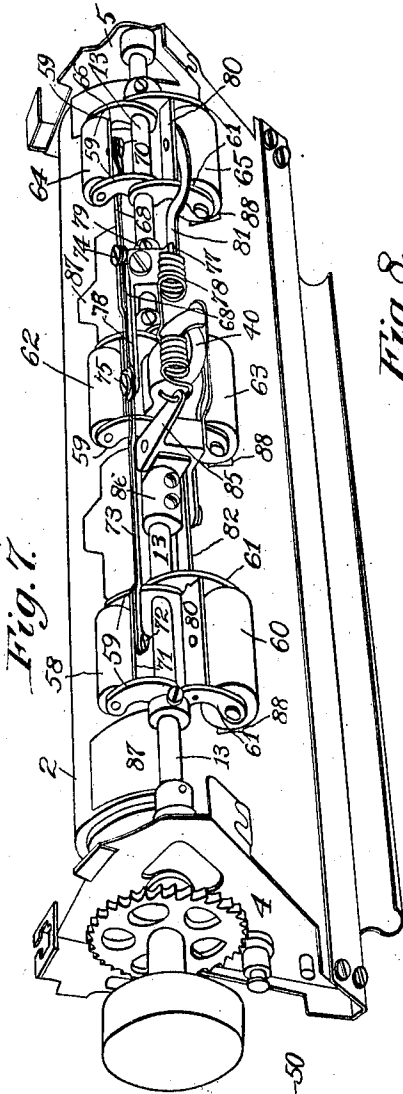
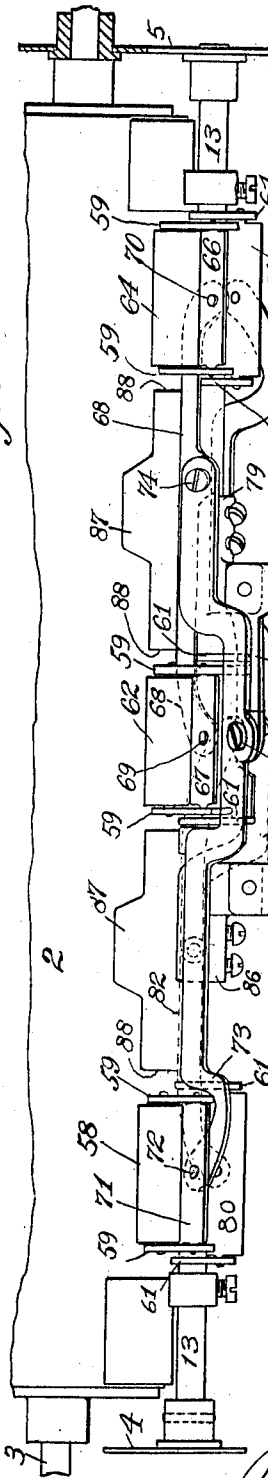


Fig. 7.

Fig. 13.



Fig. 8.



UNITED STATES PATENT OFFICE.

BURNHAM C. STICKNEY, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPE-WRITING MACHINE.

1,055,367.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Application filed December 3, 1908. Serial No. 465,784.

To all whom it may concern:

Be it known that I, BURNHAM C. STICKNEY, a citizen of the United States, residing in Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to the paper feeding pressure rolls that run upon the cylindrical platen or main feed rolls of type-writing machines.

The invention relates more particularly to machines in which several rolls are arranged end to end along the platen, and more particularly to those in which there are two tandem series of such rolls.

It is customary to place two or more rolls upon a single spring-pressed shaft which runs along the platen, but this is not found to be altogether satisfactory, because any movement of one roll away from the platen affects the other rolls on the same shaft, and tends to interfere with the true feeling of the sheet or sheets around the platen. Moreover where there are two of such shafts, each shaft being provided with two or more springs, frequent adjustment of one or more of the springs is found necessary in order to maintain an evenness of pressure on the rolls for the entire length of the platen.

One of the principal objects of my invention is to avoid these objections, and to enable any one of a series of small rolls to be moved away from the platen without affecting the main rolls, and at the same time to avoid the necessity of effecting the relative adjustment of a plurality of springs pressing said rolls against the platen.

A further object is to provide in such a structure for the canting or skewing of any roll away from the platen at one end while leaving the other end running upon the platen and without affecting the remaining rolls.

The invention may be applied either to a single line of rolls extending along the platen, or to a tandem series of such lines of rolls; and in either case, I connect a single spring to a series of rolls, which are placed end to end, the connection of the spring to said rolls being such that either roll may be lifted away from the platen without affecting the function of said spring to press the other roll or rolls against the

platen. This result is accomplished by distributing the spring pressure with substantial uniformity among all of the rolls in the line. This is preferably done by means of a compound linkage or leverage system, by which the pressure of a single spring is sub-divided in proportion among all the rolls in the line, and whereby any roll may be lifted from the platen without affecting the remaining rolls.

In the preferred form of the invention, the pressure of a single spring is divided among two rolls one lying tandem to the other, that is, placed at a different point around the periphery of the platen. Where, for instance, a single spring is made to cause each of eight rolls to press independently against the platen a substantial advantage is gained, because the necessity is avoided of adjusting each of the many springs relatively to the others, this being, however, only one of the advantages gained.

Other features and advantages will hereinafter appear.

In the accompanying drawings, Figure 1 is a perspective bottom view of the platen frame of an Underwood front strike writing machine, having applied thereto a system of eight pressure rolls embodying the invention in one form: the rolls being shown as running upon the platen. Fig. 2 is a front elevation of the same. Fig. 3 is a sectional end elevation showing the arrangement of the rolls and roll-supporting arms. Fig. 4 is a view similar to Fig. 3, but showing the rolls released from the platen. Fig. 5 is a perspective view of a roll unit comprising two tandem rolls, and interpivoted arms on which the rolls are mounted. Fig. 6 is a diagram to illustrate the toggle action, whereby the rolls are mechanically held in the released Fig. 4 position. Fig. 7 is a view similar to Fig. 1, but showing six feed rolls, and a modified method of mounting and pressing the same against the platen. Fig. 8 is a front view of the Fig. 7 structure. Fig. 9 is a diagram to show how the pressure of a single spring may be equally apportioned among six rolls extending in line along a platen. Fig. 10 shows how the pressure of such a spring may be divided among five rolls. Fig. 11 shows the spring-pressure divided among eight rolls arranged in a line. Fig. 12 is a diagram of the manner of compounding pressure rolls for three rolls em-

ployed at Figs. 7 and 8. Fig. 13 is a diagram to show one manner of releasing the system of rolls seen at Figs. 7 and 8.

Referring to Figs. 1 to 6, inclusive, types 1 strike against the front side of a platen 2 mounted by an axle 3 in the ends 4, 5 of a platen frame which also comprises a rear paper shelf 6.

Rolls 7, 8, 9 and 10 forming a line of series extending along the platen are hung by means of axles 11 in pairs of arms 12 pivoted upon a fixed rod 13, which rigidly connects the ends 4, 5 of the platen frame; said arms extending forwardly from said rod to said rolls. Each arm is loosely connected to its axle 11, to permit skewing or tilting of either end of the roll away from the platen while the other end runs thereon; or in other words, either arm 12 of the roll 7 for instance, may rock downwardly about the rod 13, while the other arm 12 does not so rock. This permits either end of any roll 7, 8, 9 or 10 to ride up over the side edge of any sheet or number of sheets passed through the machine, which is an advantage, and also insures that both ends of the roll shall run with full pressure upon the platen, regardless of any slight imperfection in the cylindrical form of the latter, due to slight fault in manufacture or to age and use of the platen itself. As will hereinafter appear, each roll is made to do its full duty for its entire length under all circumstances, and regardless of what the other rolls are doing or not doing, so that true feeding of paper or other material to be fed around the platen is assured. As many collars 14 as necessary, secured upon the rod 13, may be employed to space the pairs of arms 12; and, if desired, sleeves 15 may surround the rod 13 between the arms 12 of each pair to hold them properly separated.

The arms 12 are formed with extensions 16 directed backwardly from the pivot-rod 13; and upon said extensions 16 are pivoted at 17, arms 18 carrying rear rolls 19 by means of axles or pivot screws 20. The arms 18 of the rear rolls are hung between their ends upon the pivot 17; and the forward ends of these arms are connected in each instance by a bar 21, which extends lengthwise of the rolls; and at its middle is connected by a pivot or screw 22 to means for causing the rolls 7, 19, to press against the platen. It will be seen that downward pressure applied to the pivot or bearing point 22 will be equally divided between the forward ends of the arms 18 to turn said arms about the pair of pivots 17 to cause the rolls 19 to press up against the platen; and that the second downward pressure upon the pivot 17 will cause the arms 12 to turn upon the main pivot rod 13 in a direction to cause the front roll 7 to press against the platen. Both of the pivots 17, 20 are sufficiently loose to

cause the pressure applied at 22 to be distributed or equalized between the rolls 7, 19, and to permit either roll to swing at either end slightly away from the platen while the other end thereof runs upon the platen, and without at all disturbing the other roll. The leverage may be so proportioned between the arms 12 and 18 as to cause the forward and rear rolls to bear equally upon the platen. It will be seen that these devices comprise a unit in which the arms of one pair are hinged directly upon a fixed part of the platen frame, while the arms of the other roll are pivoted upon the first arms to form a compound leverage system to enable pressure applied at a single point in the unit to be distributed between the two rolls in a manner to permit either roll independently of the other to be either swung bodily away from the platen or lifted at either end away from the platen while the other end runs thereon.

Taking up now the adjacent rolls 8, 23, it will be seen that these rolls with their arms 12, 18 form a second unit to which the pressure may be applied at pivot 24 with the results already noted with regard to the application of pressure to pivot 22. It will also be seen that these pivots 22, 24 are loosely connected by a lever 25 which may be termed an equalizing lever. It may, for convenience, be pivoted upon the screw 22, and connected by an open slot 26 to the screw 24. Midway between its ends, this equalizing lever 25 is provided with a pivot 27, whereby the lever may be pulled downwardly with the effect of dividing the force equally between pivots 22 and 24 with the result that the pressure applied at 27 is distributed with substantial uniformity among the four rolls 7, 19, 8 and 23; and it will also be perceived that any roll of the four may be either lifted bodily or skewed away from the platen without affecting the remaining three in the group, or lessening the pressure upon any of them; and the same is true of any two or three rolls in the group. At the other end of the platen, the rolls 9, 28 form a third unit, and the rolls 10, 29 form a fourth unit, the rolls in each unit connected in the manner already described, and the units connected by an equalizing lever or bar 30 pivoted to one unit at 31 and to the other unit at 32, and having midway between its ends a pivot 33 to which the power is to be applied.

A master equalizing bar or lever 34 is pivoted at its ends upon the pivots 27, 33, and midway at its ends is connected by a slot 35 to a screw or stud 36 upon a bell-crank 37 the pendent arm 38 of which is attached one end of a coiled draw-spring 39; said spring extending beneath and along the main fixed rod 13 and caught at its other end upon a fixture 40 fixed upon the

platen frame, said fixture having notches 41, 42, to permit the tension of the spring to be regulated as more or less pressure is required for the system of pressure rolls. It will be seen that the tension to the left upon the arm 38 of the bell crank is changed by the arm 37 of the latter into a downward pressure upon the main equalizing bar 34, and that such downward pressure, which it will be seen is applied at only one point 36 in the entire roll pressure mechanism, is distributed with substantial equality between the minor equalizing bars 25 and 30, and hence with substantial uniformity among all of the eight rolls in the system, permitting any one or more rolls to be either lifted bodily or skewed away from the platen independently of the remaining rolls, and without affecting the latter or disturbing their functions. The bell-crank 37, 38 is hinged at 43 upon a block 44 fixed upon the rod 13. From the latter also depends a fixed arm 45 carrying the usual roll 46 to run upon the usual shift rail of said Underwood machine. When, for instance, roll 19 is pulled down from the platen, as by the introduction of a narrow sheet or wad of paper, its arms 18 are swung about the pivot or hinge screws 17, without however moving the arms 12 which carry said screws, since the downward pressure upon 19 tends to maintain the roll 7 against the platen. The forward ends of the arms or levers 18 swing upwardly together with their equalizing bar 21, and hence the equalizing bar 25 is tilted down at this end, the pivot screw 24 at the other end of said bar 25 remaining undisturbed since the downward movement at 22 tends to maintain 24 in place. The downward swinging of the left hand end of the lever 25 causes a slight movement of the master equalizing bar 34, the right hand end of which remains stationary, since a downward movement at one end of said bar tends to hold up the other end of said bar. The extent of movement at the middle of the bar 34 is about half that of the pin 27, and hence the bell-crank 37, 38 is vibrated slightly, and the spring 39 is slightly tensioned; but it will be seen that this is the only result of the movement of the roll 19 away from the platen. Owing to the length of the spring, its tension may remain substantially unchanged even when extended to the slight degree just indicated. In like manner, any one or more of the rolls may be practically forced away from the platen with corresponding results. Thus it will be seen that no matter what duty is placed upon any roll of the system, the remaining rolls are still enabled to perform independently their full functions.

To release the rolls, a key 47 is depressed, said key having a rock-shaft 48 hung upon the platen frame from which extends an

arm 49, the latter connected by a link 50 to an arm 51 fixed upon a rock shaft 52 journaled in a block 53 fixed upon the rod 13. Upon the same rock shaft is a pendent arm 54 connected by a link 55 to bell-crank arm 38, the pivot of the link to the bell-crank being indicated at 56. When the key 47 is depressed, the link 50 is lifted, and the arm 54 swung up to the Fig. 6 position, or to the position seen at dotted lines in Fig. 2; the link 55 forming with the arm 51 a reversed toggle, to lock the parts in the roll-releasing position, by reason of the arm 54 swinging up past the dead center position, as shown. A bar 57, Fig. 4, may extend along beneath the arms 18 to prevent the rolls 19 from falling too far and overbalancing the roll 7, thus leaving the latter free to fall away from the platen.

Referring now to Figs. 7, 8 and 12, only three units are shown, and the method of carrying out the invention is somewhat varied from that just described. Front roll 58 is carried loosely upon a pair of arms 59 hinged upon the rod 13, and rear roll 60 is carried upon a pair of arms 61 also directly hinged upon said rod 13. The rolls 62, 63 are similarly mounted to form a second pair; and rolls 64, 65 are likewise mounted to form a third pair. In this form of the invention, the roll-supporting arms 59, 61 are not compounded as at Fig. 1, nor are they directly connected. The arms 59 carrying the roll 64 are connected by an individual equalizing bar 66. The corresponding arms carrying the roll 62 are connected by an equalizing bar 67. All equalizing bars are of course loosely connected at their ends to the arms. Said bars 66 and 67 are connected by an equalizing bar 68, the same being pivoted at 69 to 67, and at 70 to 66. The arms 59 of roll 58 are connected by a short equalizing bar 71. Pivoted at 72, midway of the ends of the latter, is a long distributing bar 73, the other end of which is pivoted at 74 to the bar 68 midway between the ends of the latter. Pivoted at 75 to the bar 73 at a point one third the distance between 74 and 72 (or directly under the pivot 69) is one arm 76 of a bell crank, a pendent arm 77 of the latter being connected to a spring 78 to press the rolls 58, 62 and 64 uniformly against the platen 2. The bell-crank 76, 77 is suitably pivoted upon a collar or block 79 secured upon the rod 13. The rolls 65, 63 and 60 are provided with a similar compounded pressure distributing system including individual equalizing bars 80, a long equalizing bar 81 for the rolls 63 and 65 (corresponding to 68) and a still longer equalizing bar 82 (corresponding with 73) this bar being pivoted at 83 to a pendent arm 84 of a bell-crank, the latter comprising a pendent arm 85 connected to the other end

of the draw-spring 78 so that the latter presses both the series 58, 62 and 64, and the series 60, 63, 65 against the platen; any roll or rolls of the six being movable away from the platen in the manner and with the results already referred to with relation to the rolls at Fig. 1. The bell-crank 84, 85 is hinged upon a collar or block 86 similar to 79. The paper shelf 6 in each case is extended around under the platen to form a paper guide 87; suitable holes 88 being left for the rolls to protrude through. It will be seen at Fig. 7 that either the rolls 58, 62, 64, or the rolls 60, 63, 65 may be omitted, and that the spring 78 will act upon the remaining rolls with the shafts already described; the pressure of a single spring being divided up equally among a series of rolls extending along the platen.

Referring to Fig. 9, these rolls are shown extending along the platen; a spring such as 89 being connected to a bell crank 90 attached to a main equalizing lever 91; the latter connected at its right hand end to the middle of a sub-lever 92, and at its left hand end to the middle of a lever 93, which at its ends is connected to sub-levers 94 and 95; sub-lever 92 corresponding to 68 at Fig. 8, and being similarly connected to a pair of rolls 96, 97; sub-levers 95 being similarly connected to a pair of rolls 98; and sub-lever 94 to a pair of rolls 99. It will be understood, at Fig. 7, that on one side of the rod 13 rolls 58, 62 and 64 may be employed, and at the other side rolls 96, 97, 98, 99; or instead of three rolls on one side and six on the other of said rod 13, there may be employed two series of any dissimilar numbers of rolls, as two and four, three and ten, four and five, etc., with the rolls breaking joints, if desired; that is, with each roll in one series opposite a space with the adjoining rolls in the other series.

At Fig. 10, five rolls 100, 101, 102, 103 and 104 are shown in a line along the platen 2; 103 and 104 being connected by a sub-lever 105; 101 and 102 by a sub-lever 106; while a lever 107 is connected to roll 100 and sub-lever 106; and the main lever 108 connecting the middle 107 to the middle 105, and itself connected at a point one-third of the way between its ends to a bell-crank 109 having a spring 89.

At Fig. 11, pairs of rolls 110, 111, 112, 113, 115, 116 and 117. Sub-levers 114 and 115 are connected by a longer lever 118; while the levers 116 and 117 are connected by a longer lever 119. The levers 118 and 119 are connected by a main lever 120 attached midway of its ends to a bell-crank 121 having a spring 89.

At Fig. 13, the releasing link 50 is connected to one end of a floating lever 122, which is fulcrumed at 123 upon the end of the bell

crank 77. At its other end said lever is pivoted at 124 to a short link 125, the latter pivoted at 126 to the bell-crank 85. Upon depressing the key 47, the link 50 rises, raising the long arm of the lever 122 and depressing the short arm thereof, the latter acting with the link 125 to form a toggle, whereby the pin and arms of the bell cranks 77 and 85 are pressed apart in opposition to the tension of the spring 78, and the rolls 58, etc., are permitted to drop from the platen.

Many other variations may be resorted to within the scope of the invention; and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine, mechanism for feeding paper in line space direction, including a series of pressure rolls arranged end to end, individual bars extending along said rolls and connected respectively thereto, an equalizing pressure lever bearing at its ends upon said bars at points about midway of the length of the rolls, and means for applying pressure to the middle of said lever.

2. In a typewriting machine, mechanism for feeding paper in line space direction, including pressure rolls arranged end to end, individual bars extending along said rolls and connected respectively thereto, an equalizing pressure lever bearing at its ends upon said bars at points about midway of the length of the rolls, and means for applying pressure to the middle of said lever, each roll being mounted for skewing movement independently of the other roll.

3. In a typewriting machine, mechanism for feeding paper in line space direction, including a series of pressure rolls arranged end to end, an equalizing pressure lever having means at its ends to apply pressure to said rolls between the ends of each, and means for applying pressure to said lever about midway of its length.

4. In a typewriting machine, mechanism for feeding paper in line space direction, including pressure rolls arranged end to end, an equalizing pressure lever having means at its ends to apply pressure to said rolls, the bearing points of said lever being between the ends of the rolls, and means for applying pressure to said lever about midway of its length, each roll being mounted for skewing movement independently of the other roll.

5. In a typewriting machine, mechanism for feeding paper in line-space direction, including pressure rolls arranged end to end, a single spring member, and means controlled by said spring member and extending to the rolls independently one of another, for pressing said rolls against a

platen, said spring connected to said pressure rolls to hold either against the platen while the other is lifted from the platen.

6. In a typewriting machine, mechanism for feeding paper in line-space direction, including pressure rolls arranged end to end, a single spring, and means controlled by said spring for pressing said rolls against a platen, said spring connected to said pressure rolls to hold either against the platen while the other pressure roll is lifted from the platen, and to permit each pressure roll to skew one end away from the platen while the other end remains in contact with the platen.

7. In a typewriting machine, mechanism for feeding paper in line-space direction, including pressure rolls arranged end to end, a second series of rolls placed end to end, a single spring member, and means controlled by said spring member and extending to the rolls independently one of another, for pressing said rolls against a platen, said spring connected to said pressure rolls to hold either roll in either series against the platen while the other roll is lifted from the platen.

8. In a typewriting machine, mechanism for feeding paper in line space direction, including a series of pressure rolls arranged end to end, said series of rolls extending along a platen, a pair of guiding arms for each pressure roll, a bar connecting the arms in each pair, a lever extending from one bar to the other and bearing upon said bars between the ends of each, and means for applying pressure to said lever between its ends.

9. In a typewriting machine, mechanism for feeding paper in line space direction, including a series of pressure rolls arranged end to end, said series of rolls extending along a platen, a pair of guiding arms for each pressure roll, a bar connecting the arms in each pair, a lever extending from one bar to the other and bearing upon said bars between the ends of each, means for applying pressure to said lever between its ends, each pressure roll capable of rocking or skewing at either of its ends away from the platen while the other end remains in contact with the platen, and a fixed bar extending along the platen to which said arms are loosely hung, said individual bars being loosely connected to said arms.

10. In a typewriting machine, mechanism for feeding paper in line space direction, including a series of more than two pressure rolls placed end to end along a platen, a spring, and compound equalizing or pressure-distributing levers between said spring and said pressure rolls.

11. In a typewriting machine, mechanism for feeding paper in line space direction, including a series of pressure rolls arranged

end to end, individual bars extending along said rolls and connected respectively thereto, an equalizing pressure lever bearing at its ends upon said bars at points about midway of the length of the rolls, and means for applying pressure to the middle of said lever.

12. In a typewriting machine, mechanism for feeding paper in line space direction, including in combination a series of rolls, a platen, each roll in the series being mounted to rock at one end away from the platen while the other end runs upon the platen, a single spring, and means to distribute the pressure of said spring evenly between said rolls.

13. In a typewriting machine, mechanism for feeding paper in line space direction, including a series of pressure rolls arranged end to end; a second series of pressure rolls tandem to the first and also arranged end to end, a spring, and levers compounded to distribute the pressure of said spring on all of said rolls.

14. In a typewriting machine, the combination with a series of pressure rolls arranged end to end, of an equalizing lever connected to said rolls, a second series of pressure rolls tandem to the first and also arranged end to end and provided with an equalizing lever, means for applying pressure to said equalizing levers to press all of the rolls against the platen, and a single key having means to release all of said rolls, each of said rolls mounted to skew or rock away at one end from the platen while running at its other end on the platen.

15. In a typewriting machine, the combination with a revoluble platen and a platen frame having a rod extending along the platen, of arms pivoted on said rod and extending forwardly and backwardly therefrom, rolls carried upon said arms to run upon the platen, a spring, and means to enable said spring to cause the rolls to press equally against the platen.

16. In a typewriting machine, the combination with a revoluble platen and a platen frame, of a roll, a carrier therefor pivoted upon the platen frame, a second roll, a second roll carrier pivoted upon the first, a spring, and means controlled thereby and connected to the second roll carrier to cause both rolls to press upon the platen.

17. In a typewriting machine, the combination with a revoluble platen and a platen frame, of a roll, a carrier therefor pivoted upon the platen frame, a second roll, a carrier therefor pivoted upon the first carrier, a spring, and means controlled thereby and connected to the second roll carrier to cause both rolls to press upon the platen, the second roll carrier hinged between its ends to one end of the first roll

carrier, and the latter pivoted between its ends upon the platen frame.

18. In a typewriting machine, the combination with a revoluble platen and a platen frame, of a roll, a carrier therefor pivoted upon the platen frame, a second roll, a carrier therefor pivoted upon the first carrier, a spring, and means controlled thereby and connected to the second roll carrier to cause both rolls to press upon the platen, the second roll carrier hinged between its ends to one end of the first roll carrier, and the latter pivoted between its ends upon the platen frame, each carrier comprising a pair of arms loosely mounted and connected to permit its roll to skew endwise away from the platen.

19. In a typewriting machine, the combination with a revoluble platen and a platen frame, of a roll, a carrier therefor pivoted upon the platen frame, a second roll, a carrier therefor pivoted upon the first carrier, a spring, and means controlled thereby and connected to the second roll carrier to cause both rolls to press upon the platen, the second roll carrier hinged between its ends to one end of the first roll carrier, and the latter pivoted between its ends upon the platen frame, each carrier comprising a pair of arms loosely mounted and connected to permit its roll to skew endwise away from the platen, and the arms of the second roll carrier loosely connected by a cross bar to which said spring is connected.

20. The combination with a revoluble platen and a platen frame, of a set of pressure roll devices, each set comprising a roll, a carrier therefor pivoted upon the platen frame, a second roll, a second roll carrier pivoted upon the first carrier, and a spring connected to the second roll carrier to cause both rolls to press upon the platen.

21. The combination with a revoluble platen and a platen frame, of a set of pressure roll devices, each set comprising a roll, a carrier therefor pivoted upon the platen frame, a second roll, a second roll carrier pivoted upon the first carrier, and a spring connected to the second roll carrier to cause both rolls to press upon the platen, the second roll carrier hinged between its ends to one end of the first roll carrier, and the latter pivoted between its ends upon the platen frame.

22. The combination with a revoluble platen and a platen frame, of a set of pressure roll devices, each set comprising a roll, a carrier therefor pivoted upon the platen frame, a second roll, a second roll carrier pivoted upon the first carrier, and a spring connected to the second roll carrier to cause both rolls to press upon the platen, the second roll carrier hinged between its ends to one end of the first roll carrier, and the lat-

ter pivoted between its ends upon the platen frame, each carrier comprising a pair of arms loosely mounted and connected to permit its roll to skew away from the platen.

23. The combination with a revoluble platen and a platen frame, of a set of pressure roll devices, each set comprising a roll, a carrier therefor pivoted upon the platen frame, a second roll, a second roll carrier pivoted upon the first carrier, and a spring connected to the second roll carrier to cause both rolls to press upon the platen, the second roll carrier hinged between its ends to one end of the first roll carrier, and the latter pivoted between its ends upon the platen frame, each carrier comprising a pair of arms loosely mounted and connected to permit its roll to skew away from the platen, and the arms of the second roll carrier loosely connected by a cross bar to which said spring is connected.

24. The combination with a revoluble platen and a platen frame, of a set of pressure roll devices, each set comprising a roll, a carrier therefor pivoted upon the platen frame, a second roll, a second roll carrier pivoted upon the first carrier, and a spring connected to the second roll carrier to cause both rolls to press upon the platen, the second roll carrier hinged between its ends to one end of the first roll carrier, and the latter pivoted between its ends upon the platen frame, each carrier comprising a pair of arms loosely mounted and connected to permit its roll to skew away from the platen, and the arms of the second roll carrier loosely connected by a cross bar to which said spring is connected, and a lever attached at its ends to said cross bars between the ends of each cross bar, said spring connected to said lever, whereby its pressure is distributed among the four rolls.

25. In a typewriting machine, the combination with a revoluble platen and a platen frame, of a system of pressure rolls and appliances comprising two groups of pressure roll devices, each of said groups comprising two sets of pressure roll devices, each set comprising a roll, a carrier therefor pivoted upon the platen frame, a second roll, a second roll carrier pivoted upon the first carrier, and a spring connected to the second roll carrier to cause both rolls to press upon the platen, the second roll carrier hinged between its ends to one end of the first roll carrier, and the latter pivoted between its ends upon the platen, each carrier comprising a pair of arms loosely mounted and connected to permit its roll to skew away from the platen, and the arms of the second roll carrier loosely connected by a cross bar to which said spring is connected, and a lever attached at its ends to said cross bars between the ends of each cross bar, and said spring connected to said lever, whereby its

pressure is distributed among the four rolls; said levers connected by a main lever to which said spring is attached, whereby the pressure of the latter is distributed among all the rolls in the system.

26. In a typewriting machine, the combination with a revoluble platen, of a plurality of feeding roll sets, each set comprising a plurality of roll-carriers connected to move together toward or away from the platen, a lever connecting said sets, and a spring connected to said lever to distribute its pressure among all the rolls in said sets.

27. In a typewriting machine, the combination with a revoluble platen, of a plurality of feeding roll sets, each set comprising a plurality of roll-carriers connected to move together toward or away from the platen, one of the carriers in each set being pivoted or hinged upon the platen frame, and the second carrier being pivoted to the first, a lever connecting said sets, and a spring connected to said lever to distribute its pressure among all the rolls in said sets.

28. In a typewriting machine, the combination with a revoluble platen and eight rolls to run thereon, of a single spring, and means to distribute the pressure of said spring among all of said rolls and permit each roll to move away from the platen independently of all the others.

29. In a typewriting machine, the combination with a revoluble platen and eight rolls to run thereon, of a single spring, and means to distribute the pressure of said spring among all of said rolls and permit each roll to move away from the platen independently of all the others, each roll mounted to skew endwise away from the platen.

30. In a typewriting machine, the combination with a revoluble platen, of a set of four rolls to run thereon, a lever to which all of said rolls are connected, a second set of four rolls to run upon the platen, a second lever to which all the rolls in the second set are connected, a third lever connecting the first and second levers, and a spring connected to the third lever to distribute its pressure among the eight rolls.

31. The combination with a platen, of a fixed rod extending along the platen, four rolls running on the platen on one side of said rod, four rolls running on the platen on the other side of said rod, all of said rolls mounted on said rod, a single spring, and means for distributing the pressure of said spring among all of said rolls, so that each may bear upon the platen independently of all the others.

32. In a typewriting machine, the combination with a revoluble platen, of a plurality of feeding roll sets, each set comprising a plurality of roll-carriers connected to move together toward or away from the

platen, a lever connecting said sets, a spring connected to said lever to distribute its pressure among all the rolls in said sets, and means for releasing all of the rolls simultaneously and holding them mechanically in released positions.

33. The combination with a platen, of a single spring, mechanism by which the tension of said spring may be transmitted to eight rolls to cause them to press against the platen, each independently of all the others, and means for adjusting the tension of said spring.

34. The combination with a platen, of a single spring, mechanism by which the tension of said spring may be transmitted to eight rolls to cause them to press against the platen, each independently of all the others, means for adjusting the tension of said spring, and means for releasing the rolls in opposition to the tension of said spring.

35. In a typewriting machine, the combination with a rotatable platen, of a pressure roll between the center and each end of the platen, a single spring member, and means controlled thereby for causing the rolls to press against said platen with equal pressure; the spring having independent connections to said rolls.

36. In a typewriting machine, the combination with a rotatable platen, of a pressure roll between the center and each end of the platen, a single spring for the rolls, and means extending independently to the rolls for dividing pressure of said spring equally between said rolls.

37. In a typewriting machine, the combination with a platen, of a pair of pressure rolls, a second pair of pressure rolls, a lever joining said pairs, and a spring holding said lever to cause both of said pairs to press against said platen.

38. In a typewriting machine, the combination with a platen, of a pair of pressure rolls, a second pair of pressure rolls, a lever joining said pairs, a spring holding said lever to cause both of said pairs to press against said platen, and a key for moving said lever to move said rolls from said platen.

39. In a typewriter, the combination with a platen frame and a rotatable platen mounted therein, of pressure rolls to bear against the platen, a lever nearly parallel to the axis of one of said rolls to move it to and from the platen, a second lever pivoted on the platen frame to which said first lever is pivoted, a spring acting on said second lever to move the first to press the rolls against the platen, and a key for moving said second lever against said spring to move said roll from said platen.

40. In a typewriter, the combination with a platen frame and a rotatable platen therein, of pressure rolls to bear against the

platen, a frame carrying two of said rolls comprising pivots to make the rolls bear with equal pressure on the platen, a second frame carrying two other of said rolls, a lever connecting said frames, a spring moving said lever to cause said rolls to press against the platen, a crank carrying a pivot for said lever, a link pivoted on an arm of said crank and a key moving said link to move said rolls from said platen and arranged to lock them there.

41. In a typewriter, the combination with a platen frame and a revoluble platen therein, of a fixed rod extending lengthwise of said frame, and near said platen, a roll carrier pivoted on said rod, a roll in said carrier, a second carrier, a roll therein disposed on the side of said rod opposite said first roll, a single spring, and means connected to said spring for causing said rolls to bear against said platen.

42. In a typewriter, the combination with a platen frame and a revoluble platen therein, of a fixed rod extending lengthwise of said frame and near said platen, a roll carrier pivoted on said rod, a roll in said carrier, a second carrier, a roll therein disposed on the side of said rod opposite said first roll, a single spring, means connected to said spring for causing said rolls to bear against said platen, and a key for locking said rolls away from said platen.

43. In a typewriter, the combination with a platen frame and a revoluble platen therein, of a fixed rod extending lengthwise of said frame and near said platen, a roll carrier pivoted on said rod, a roll in said carrier, a second carrier, a roll therein disposed on the side of said rod opposite said first roll, a second pair of rolls similarly disposed at another point on said rod, a single

spring, and means connected to said spring for causing all of said rolls to bear against said platen.

44. The combination with a revoluble platen, of a series of rolls extending along the platen, a second series of rolls also extending along the platen and tandem with the first series, a single spring member, and means connecting with said spring member to all of said rolls in a manner to cause the rolls of either series to bear against the platen while the rolls of the other series are raised from the platen, and also in a manner to cause the rolls at either end of the platen to bear against the same while the rolls at the other end of the platen are raised therefrom; each roll being skewable independently of all the others.

45. In a typewriting machine, the combination with a rotatable platen, of a pressure roll between the center and each end of the platen, another corresponding set of rolls tandem to the first rolls, so that the paper feeds first over one set and then over the second set of rolls, a single spring member, and means controlled thereby and extending independently to the rolls for causing all of said rolls to bear against the platen with equal pressure.

46. In a typewriter, the combination with a platen frame and a rotatable platen therein, of pressure rolls extending parallel therewith, a single tension spring nearly parallel to said platen, and means extending from said spring to said rolls to hold said rolls independently tensioned against the platen.

BURNHAM C. STICKNEY.

Witnesses:

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