J. A. HAGERSTROM.

PAPER FEEDING DEVICE.

APPLICATION FILED NOV. 1, 1917.

1,311,688.

Patented July 29, 1919.

2 SHEETS—SHEET 1.

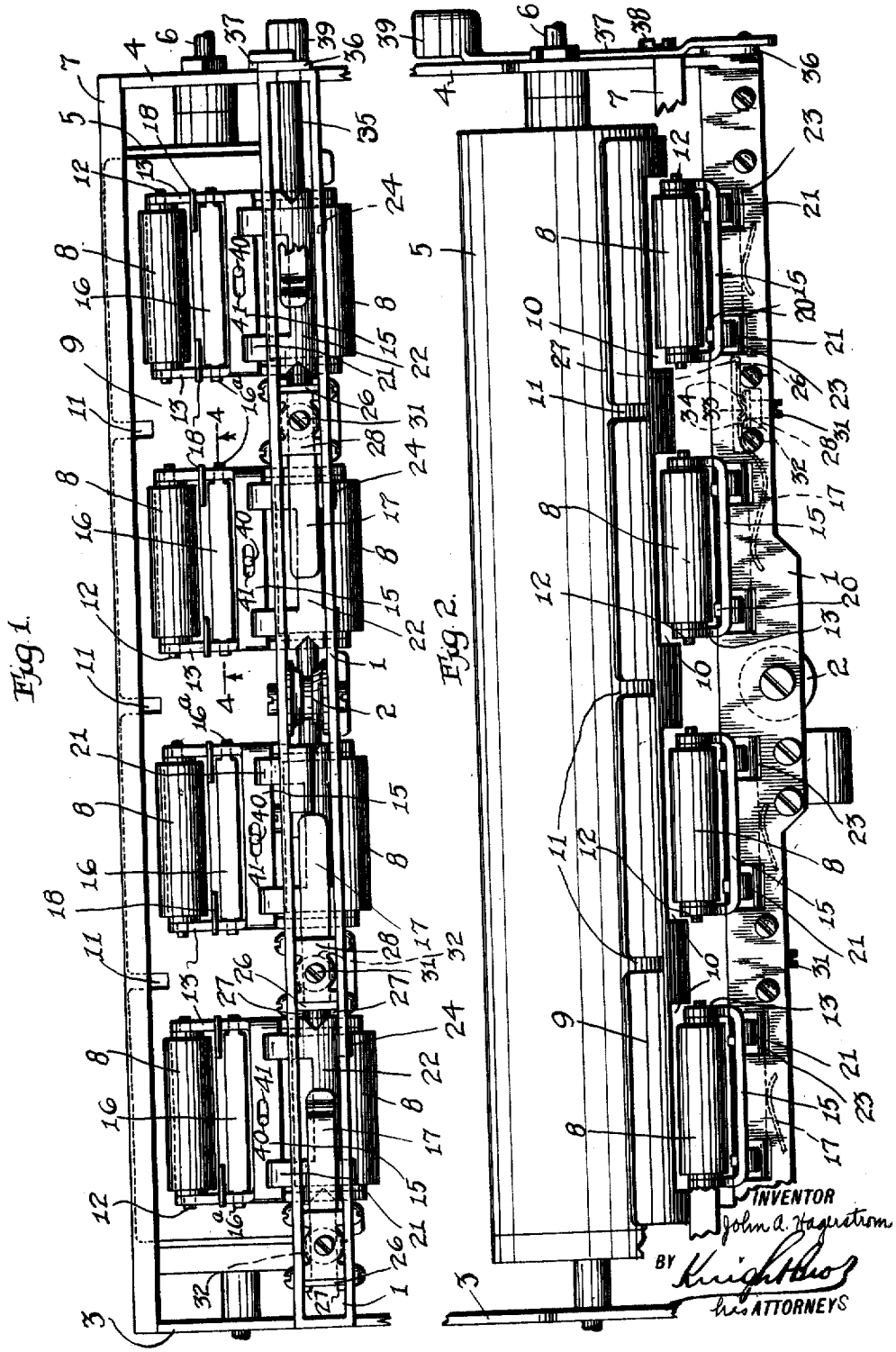


Fig 1.

Fig 2.

INVENTOR
John A. Hagerstrom
BY Knight Bros
his ATTORNEYS

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

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Fig. 3.

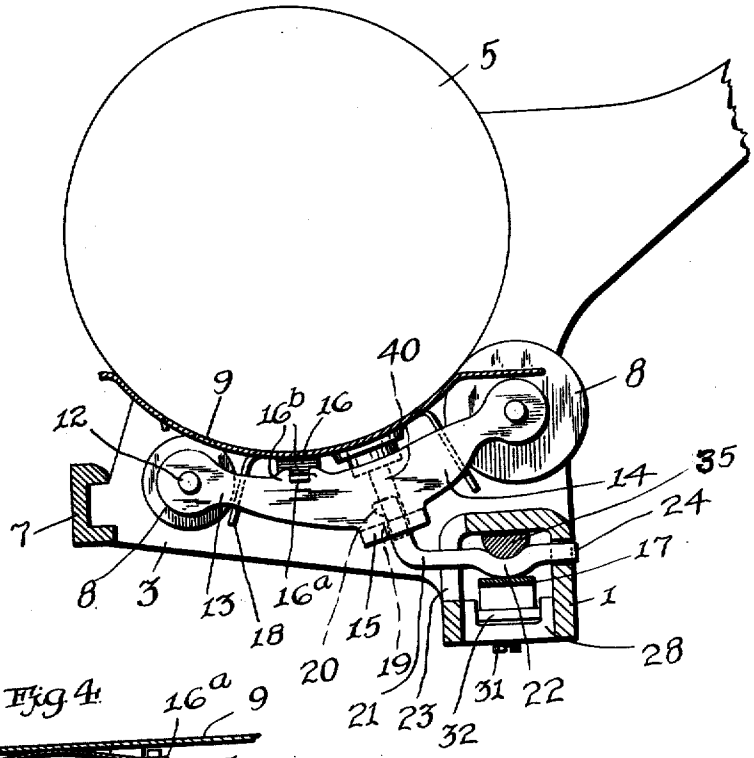


Fig. 4.

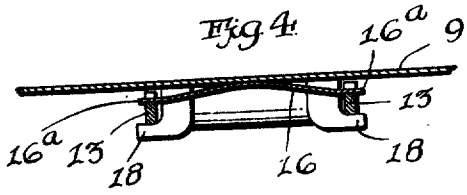


Fig. 5.

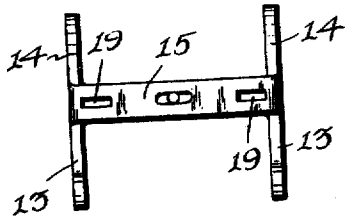


Fig. 6.

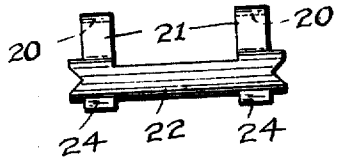
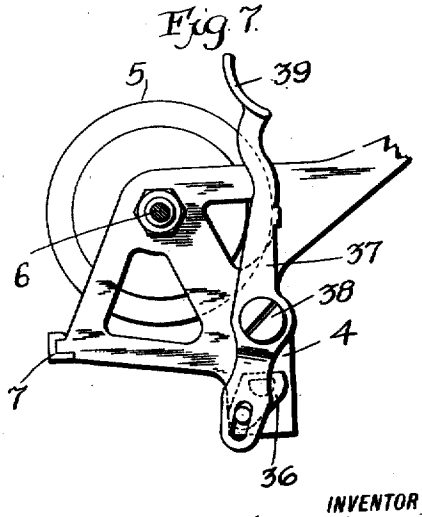


Fig. 7.



INVENTOR

John A. Hagerstrom

BY Knight Bros

his ATTORNEYS

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN A. HAGERSTROM, OF SCRANTON, PENNSYLVANIA, ASSIGNOR TO VICTOR TYPEWRITER COMPANY, OF SCRANTON, PENNSYLVANIA, A CORPORATION OF NEW YORK.

PAPER-FEEDING DEVICE.

1,311,688. Specification of Letters Patent. **Patented July 29, 1919.**

Application filed November 1, 1917. Serial No. 199,741.

To all whom it may concern:

Be it known that I, JOHN A. HAGERSTROM, a citizen of the United States, residing in Scranton, county of Lackawanna, State of Pennsylvania, have invented new and useful Improvements in Paper-Feeding Devices, of which the following is a specification.

My invention relates to typewriting machines or the like and particularly to those devices which coöperate with the rotatable platen to secure a smooth and accurate feeding of the work sheet through the machine.

The primary object of my invention is to provide a device which will function efficiently and which may be simply and economically constructed and assembled.

In the accompanying drawing, I have shown by way of illustration, an embodiment of my invention as applied to the Victor typewriting machine. It will be observed, however, that the invention is applicable to any typewriting or similar machine and is capable of modification in respect to details within the scope of the claims.

In the drawings,

Figure 1 is a bottom view of the Victor typewriting carriage containing my improvement, numerous parts which ordinarily accompany such a carriage being omitted.

Fig. 2 is a front elevation of the same.

Fig. 3 is a transverse sectional view on the line III—III of Fig. 1.

Fig. 4 is a longitudinal sectional view on the line IV—IV of Fig. 1.

Figs. 5 and 6 are bottom views of feed roll supporting members.

Fig. 7 is an end elevation.

Referring more particularly to the drawings, the carriage consists of a channel bar 1, having a bearing roller 2 and end plates 3, 4. Between the end plates, platen 5 is rotatably mounted on shaft 6, which is journaled in the end plates 3, 4. Scale bar 7 is of usual construction and need not be further referred to.

Coming now to the improvements covered by the present invention, these consist mainly in a plurality of pairs of feed rolls 8, a paper apron 9, together with supporting members for the said rolls and apron and means for moving the same forward or away from the platen at will. The apron and feed rolls are located underneath the platen and are intended to hold a work sheet or work sheets against the platen at this point. The feed rolls are positioned in two longitudinal rows of openings 10 which are likewise paired in a transverse direction. The work sheets will thus be supported by a front and rear series of feed rolls and, between the feed rolls, by the continuous paper apron 9. Nearly all of the parts which go to make up my invention, including the apron 9, may be formed from sheet metal, thus insuring economy of material and labor and the utmost lightness consistent with strength. As shown, the apron 9 has a series of notches 11, cut into its front edge for the purpose of increasing the flexibility of the apron. The front and rear edges of the apron and of the openings 10 are turned up slightly to prevent them from catching the work sheet as it passes through the machine in either direction. Each pair of feed rolls 8 has pintles 12, by means of which the feed rolls are journaled in the ends of forwardly and rearwardly projecting arms 13, 14 of cradles 15. The apron 9 is also supported by cradles 15 through leaf springs 16, which are flexed so as to bear upwardly against the apron at their middle portions. The springs have reduced end portions 16^a thus forming shoulders which abut against lugs or projections 16^b on the arms 13 (see Figs. 1, 3 and 4). The strength of the springs 16 is adjusted so as to press the apron 9 lightly against the work sheets, but not as strongly as the feed rolls are pressed by the springs 17 hereinafter described. A number of hooks 18 preferably integral with apron 9, engage arms 13, 14 so that the feed roll and apron can be simultaneously withdrawn from the platen by means acting on the cradles 15. Interposed between the apron 9 and the arms 13 of each cradle is a bowed leaf spring 16 which yieldably retains the hooks 18 in engagement with the arms 13. For this purpose, said arms 13 are provided with notches 16^a to receive the reduced ends 16^b of the spring 16. Mounted on the apron 9 are also a number of guide pins 40 which have their outer ends projecting slightly through elongated perforations or slots 41 in cradles 15. The extreme right and left pins 40 are so positioned as to bear freely against the outer ends of their respective slots 41, thus preventing longitu-

dinal displacement of the apron in either direction. The intermediate pins 40 may be positioned anywhere in their respective slots preferably intermediate of the ends thereof. All the pins are effective in preventing transverse or rotary movement of the apron with the platen while at the same time permitting a radial adjustment with respect thereto.

It has been found that better feeding results where the back feed rolls press more strongly against the platen than do the front feed rolls. This effect is obtained in the construction described by making the forwardly projecting arms 13 longer than the rearwardly projecting arms 14. Consequently, the pressure delivered to the arms by the cradles 15 will be unevenly divided between the front and back pairs of arms, the back pairs 14 receiving the major portion of the pressure and thus making more pronounced the disparity between the pressure delivered by the front feed rolls and the back feed rolls. Each cradle 15 has a pair of holes 19 through which project the reduced portions 20 of arms 21. The cradles are thus capable of a limited rocking motion on a longitudinal axis, so that the pressure with respect to the forward and rear feed rolls of each pair will be equalized. The arms 21 extend forwardly and upwardly from yokes or rockers 22, and project through openings 23 in channel bar 1. Said yokes or rockers are provided with rearwardly extending lugs 24 loosely seated in perforations 25 of channel bar 1. As shown by Figs. 4 and 5, members 22 are capable of a rocking movement on the lugs, 24 as pivots and this movement is imparted to cradles 15, feed rolls 8 and paper apron 9. A series of springs 17 bear at their free ends against the underside of members 22, thus tending to hold the feed rolls against the platen. The fixed ends of the springs 17 have lateral extensions 26 which are held against upward displacement by engaging respectively a pair of extensions 27 which are supported in a manner now to be explained. For each spring 17 there is a block 28 of a width such as to cause it to seat snugly in channel bar 1. At its four corners the block 28 has ears 29 struck up at right angles to the block and having threaded perforations. Screws 30 project laterally through channel bar 1 and into the threaded perforations of ears 29. The extensions 27 heretofore referred to, are preferably formed as an integral part of the right or left pair of ears 29, depending upon the direction in which the corresponding spring 17 is presented. An adjustment screw 31 having threaded engagement with block 28 projects into the channel or bar 1 and has on its inner end the bearing plate 32. This plate provides a seat for hump 33 formed in spring 17. It will be obvious that by advancing or retracting screw 31, the tension of spring 17 may be respectively increased or lessened. A pair of peripheral lugs 34 on plates 32 ride over hump 33 as the screw turns and thus coact with the hump as a locking device to maintain the adjustment.

The means for depressing members 22 against springs 17 comprises a cam rod 35 which extends substantially the entire length of the channel bar 1, and has at one end means for rocking it, comprising an arm 36. This arm has pin and slot connection with the rocking lever 37 pivoted to end plate 4 as by screw 38, and having a finger seat 39. Cam rod 35 may be of any desired non-circular cross section, but is preferably D-shaped or semi-cylindrical as shown. When the device is in the paper gripping position, as in Fig. 3, the flat side of rod 35 will bear against channel bar 31, while its curved portion will be partially embraced by the transversely concave upper surface of members 22. When the upper end of lever 37 is brought forward, rod 35 will be turned through an angle of 90°, thus shifting its greatest diameter from horizontal to vertical and forcing the member 32 downward. The parts will remain in this position as long as desired, since the spring 17 does not exert any turning movement on rod 35 so long as its flat side is substantially vertical.

The operation of the device has been made sufficiently apparent to one skilled in the art, in the course of the foregoing description.

I claim:—

1. In a typewriting machine, the combination with a platen, of front and back feed rolls operatively disposed with respect to said platen, a cradle having forwardly and rearwardly presented pairs of arms for supporting said feed rolls, a transversely arcuated paper apron provided with hooks engaging one pair of said arms, and a leaf spring having its ends seated on said pair of arms and its middle portion bearing against said paper apron for yieldably holding said cradle and apron in predetermined relative positions.

2. In a typewriting machine, the combination with a platen and feed rolls, of a support for said feed rolls, a leaf spring having one end bearing against said support and tending to press said feed rolls against the platen, a fixed abutment for the other end of said spring, and an adjustable seat intermediate of the ends of said spring for tensioning the same.

3. In a typewriting machine, the combination with a platen and feed rolls, of a support for said feed rolls, a leaf spring having one end bearing against said support and tending to press said feed rolls against the

platen, a fixed abutment for the other end of said spring, a seat for said spring intermediate of its ends, a threaded stem for said seat, a threaded bearing for said stem, and means for rotating said stem.

4. In a typewriting machine, the combination with a platen and feed rolls, of a support for said feed rolls, a leaf spring having one end bearing against said support and tending to press said feed rolls against the platen, a fixed abutment for the other end of said spring, a seat for said spring intermediate of its ends, means for increasing the friction between the seat and spring, a threaded stem for said seat, a threaded bearing for said stem, and means for rotating said stem.

5. In a typewriting machine, the combination with a platen and feed rolls, of a support for said feed rolls, a leaf spring having one end bearing against said support and tending to press said feed rolls against the platen, a fixed abutment for the other end of said spring, a hump on the under side of said spring intermediate of its ends, and an adjustable seat for said hump.

6. In a typewriting machine, the combination with a platen and feed rolls, of a support for said feed rolls, a leaf spring having one end bearing against said support and tending to press said feed rolls against the platen, a fixed abutment for the other end of said spring, a hump on the under side of said spring intermediate of its ends, a seat for said hump, a threaded stem for said seat, a threaded bearing for said stem, means for rotating said stem, and a hump on said seat which displaces the spring as the seat is rotated, for the purpose described.

7. In a typewriting machine, the combination with a platen, of a transversely arcuated paper apron, a plurality of spring pressed supports for pressing said apron against the platen, means for drawing the apron away from the platen, perpendicular pins on the under side of said apron, and guide-slots in said supports, the said pins projecting into said slots respectively.

8. In a typewriter, a platen carriage provided with a longitudinal rail, arms oscillatably mounted on said rail, a cradle articulately connected to said arms, rolls journaled in said cradle, a paper apron provided with hooks engaging said cradle for preventing the separation of said cradle and apron, and a spring interposed between said cradle and apron and tending to separate said cradle and apron.

9. In a typewriter, a carriage provided with a channel bar extending longitudinally of said carriage, a yoke or rocker oscillatably seated in one flange of said channel bar and extending through openings in the other flange of said channel bar, a cradle articulately connected to said yoke or rocker, paper rolls journaled in said cradle, a paper apron provided with connections with said cradle for limiting the relative displacement between said cradle and apron, and a spring interposed between said apron and cradle and tending to separate the same.

JOHN A. HAGERSTROM.

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