Oct. 31, 1950

J. C. VELTMAN ET AL
PAPER FEEDING AND GUIDING
MECHANISM FOR TYPEWRITERS

2,527,859

Filed June 24, 1946

4 Sheets-Sheet 1

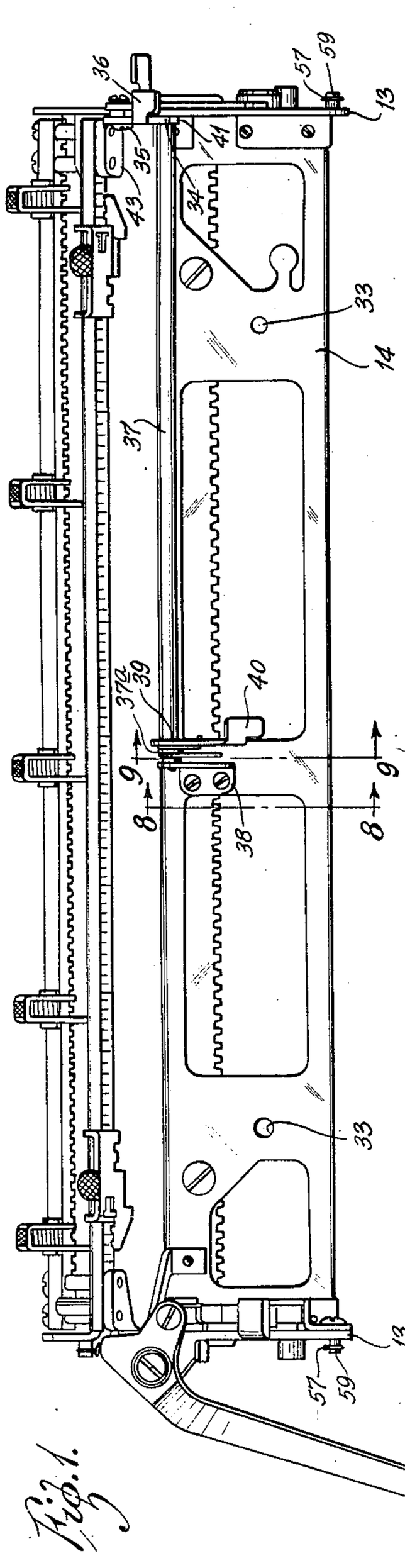

Fig. 1.

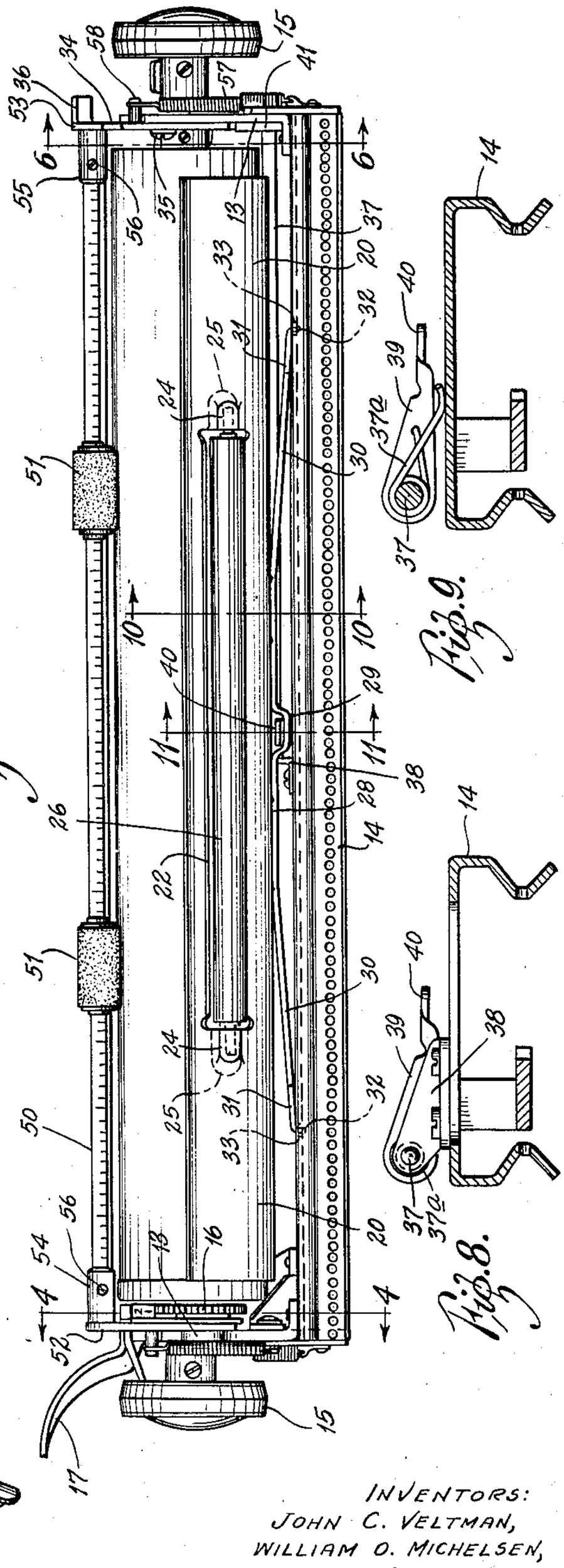

Fig. 2.

Fig. 3.

Fig. 8.

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Fig. 3.

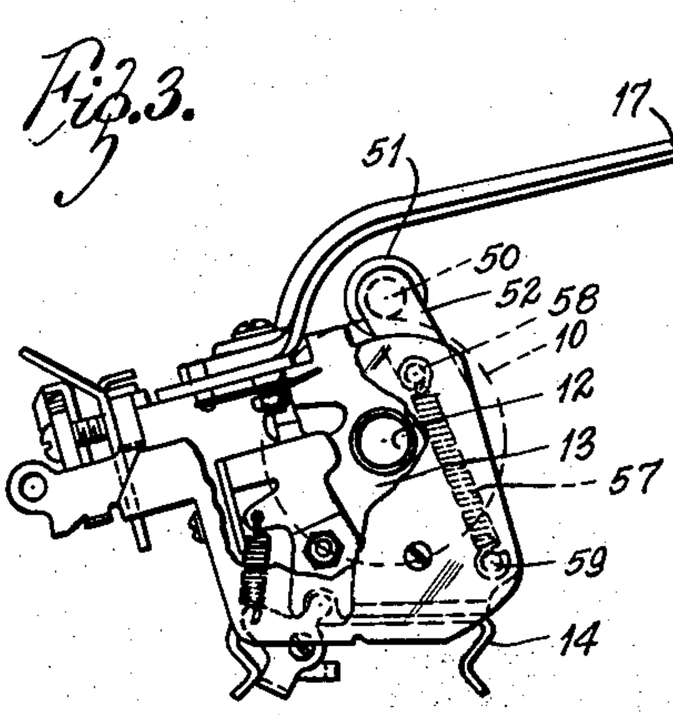

Fig. 5.

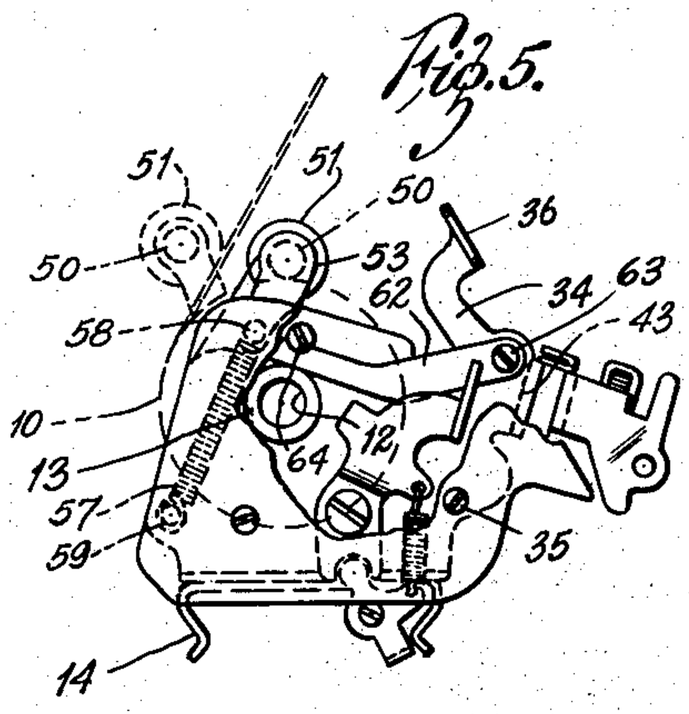

Fig. 4.

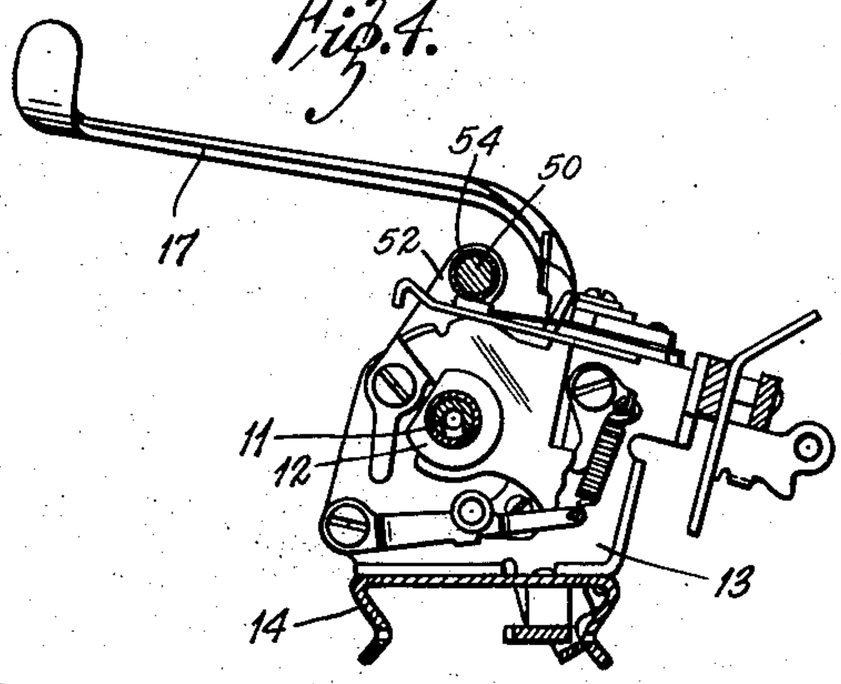

Fig. 6.

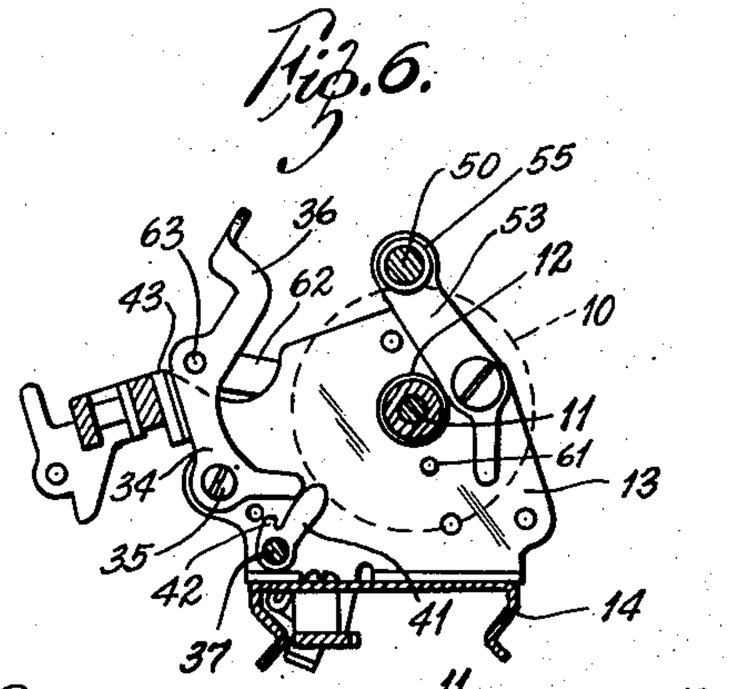

Fig. 7.

Fig. 10.

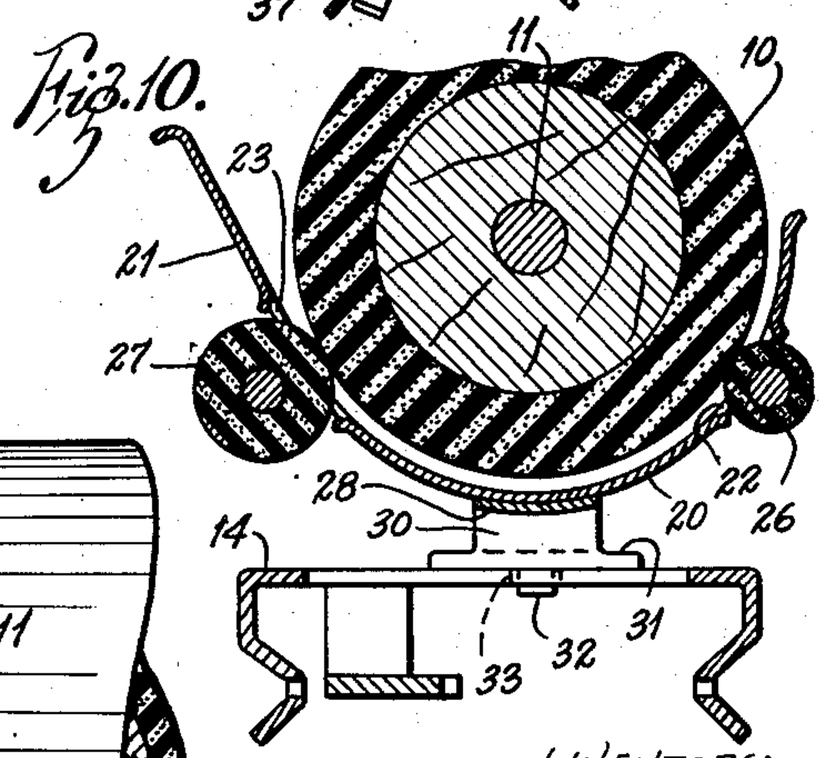

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Fig. 11.

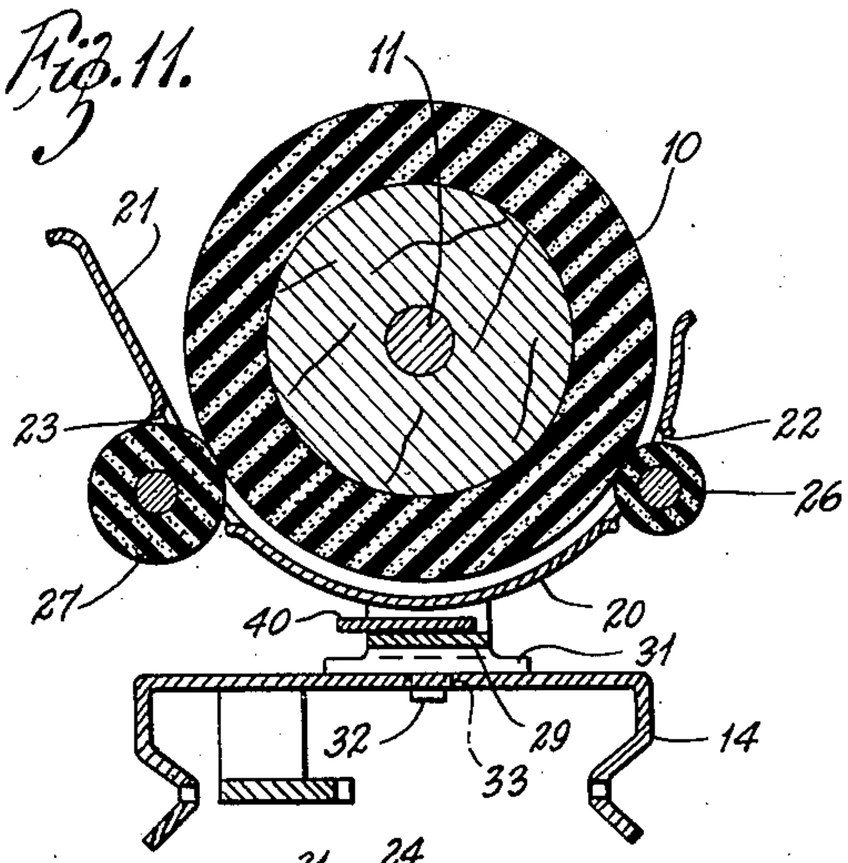

Fig. 12.

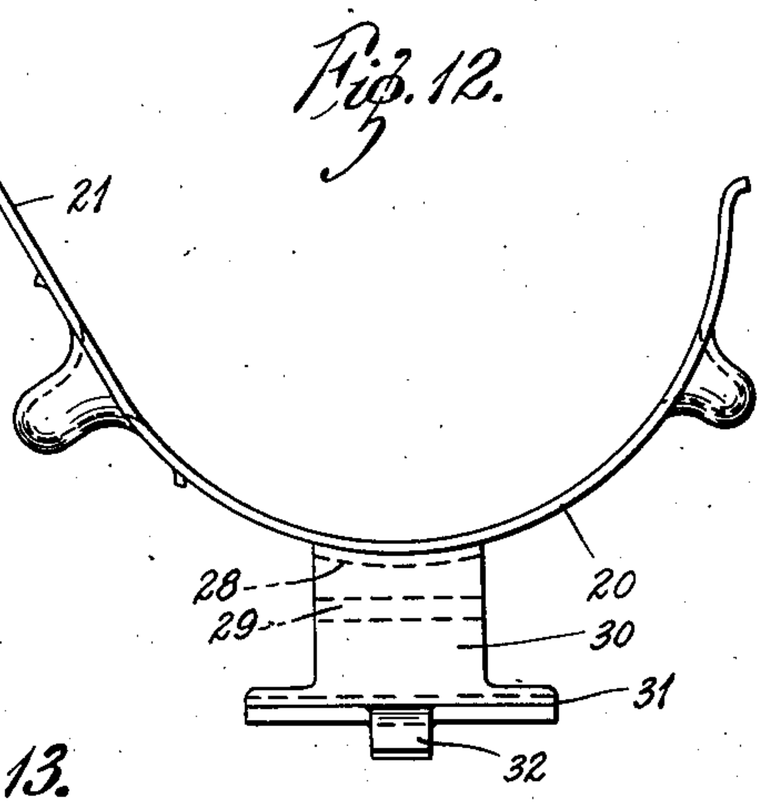

Fig. 13.

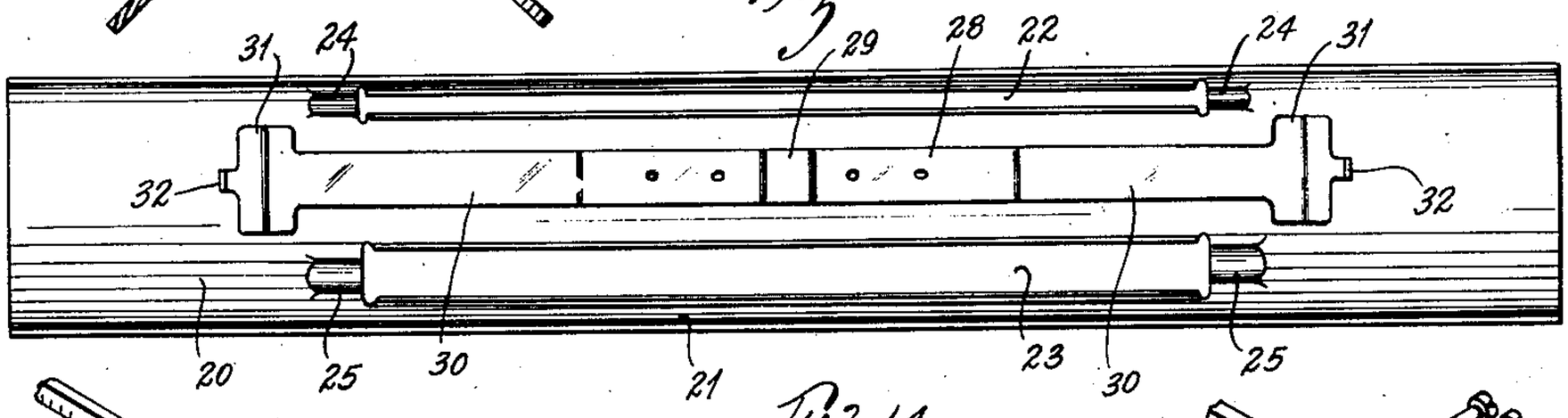

Fig. 14.

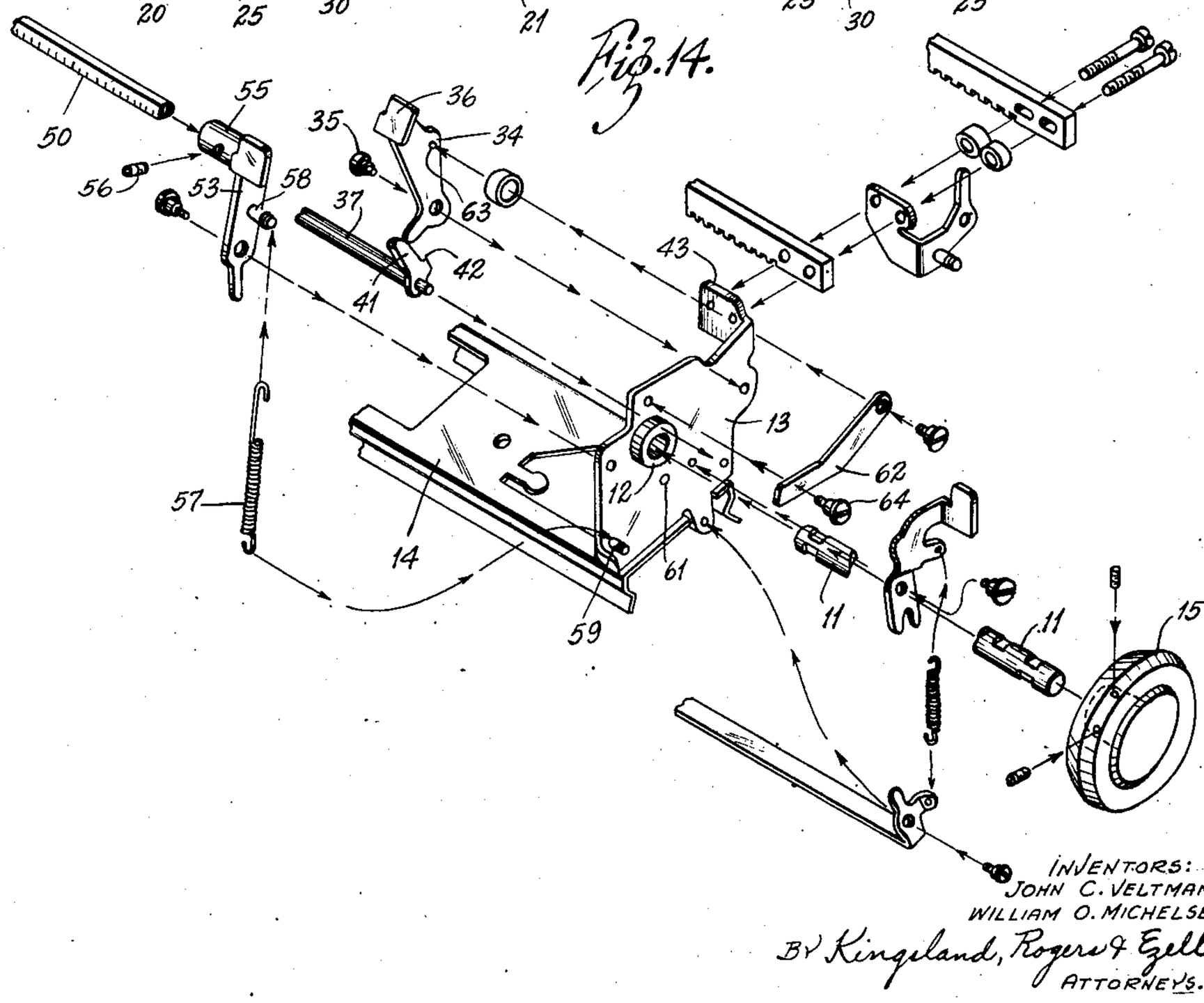

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Fig. 15.

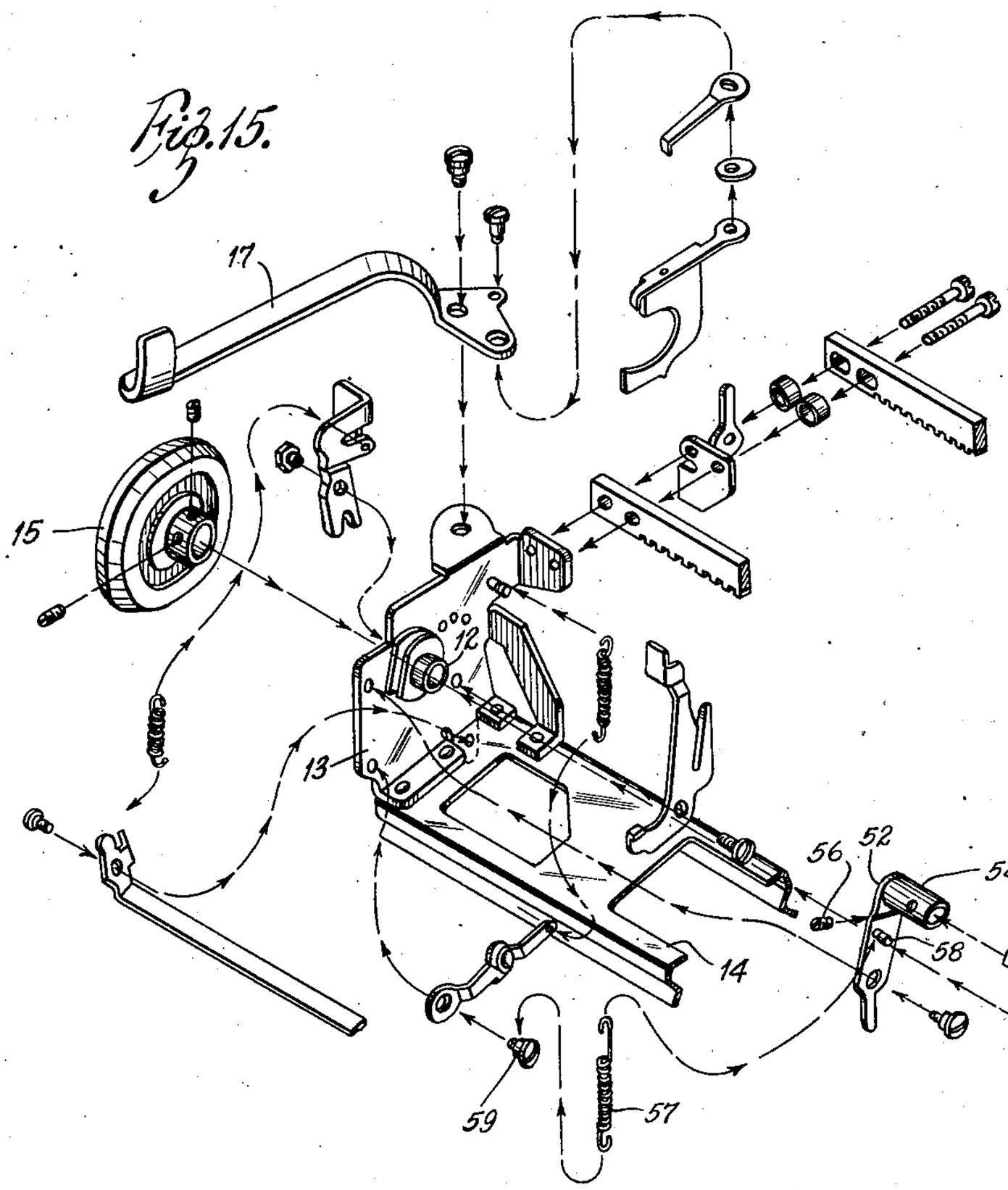


Fig. 16.

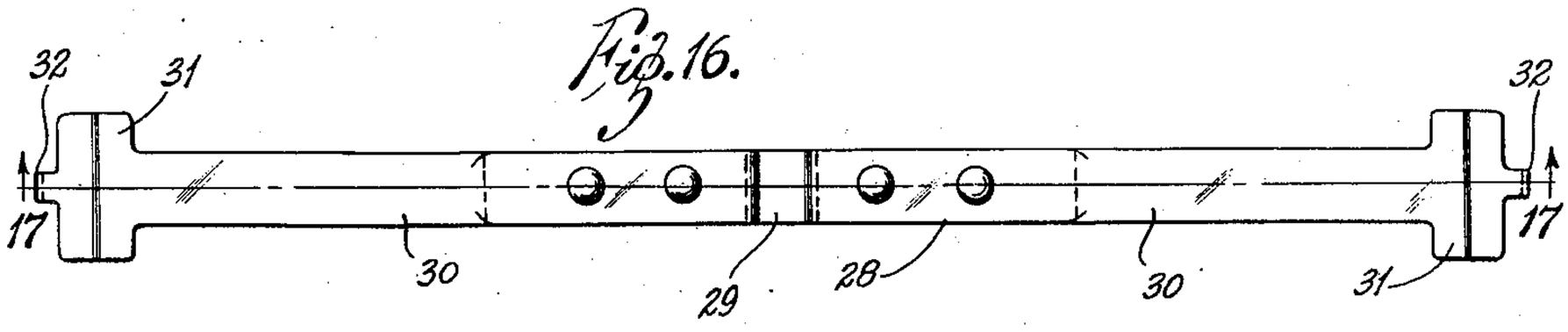
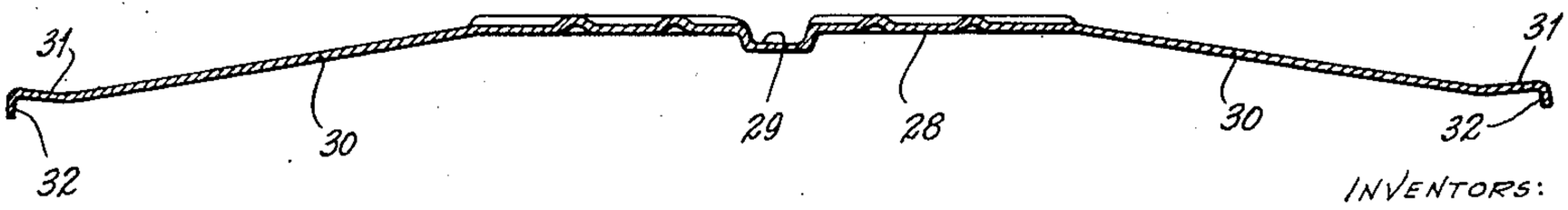


Fig. 17.



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PAPER FEEDING AND GUIDING MECHANISM FOR TYPEWRITERS

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Application June 24, 1946, Serial No. 678,995

8 Claims. (Cl. 197—138)

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This invention relates to improvements in typewriters, and more particularly to improvements in the paper feed and paper guide for such machines.

An object of the invention is to provide improved, efficient means for holding the paper in printing position, and to firmly lock the paper against the platen in order to permit the paper sheets to be advanced step by step past the printing point, thereby insuring accurate alignment of the type on the printing line.

Another object of the invention is to provide a device of the class mentioned, whereby the paper may be guided when the locking action is released in order that it may be readily adjusted to a proper position for the performance of the printing operation and the advancement of the paper in the carriage.

Another object of the invention is the simplification of a device of the type mentioned which is compact and relatively light in weight, adapting it especially for incorporation in small typewriting machines of the portable type, and which device may be economically manufactured and assembled.

Additional advantages of the invention will be apparent from the following detailed description thereof taken in connection with the accompanying drawings, in which:

Fig. 1 is a top plan view of the paper carriage assembly with certain of the parts removed to clearly illustrate certain essential elements of the invention;

Fig. 2 is a front elevation of the completed paper carriage assembly;

Fig. 3 is a left end elevation of the portion of the carriage assembly illustrated in Fig. 1;

Fig. 4 is a vertical section on the line 4—4 of Fig. 2;

Fig. 5 is a right end elevation of the portion of the carriage assembly illustrated in Fig. 1;

Fig. 6 is a vertical section on the line 6—6 of Fig. 2;

Fig. 7 is an enlarged sectional view of the left end of the platen to partly illustrate certain details of the construction;

Fig. 8 is an enlarged horizontal section on the line 8—8 of Fig. 1;

Fig. 9 is an enlarged horizontal section on the line 9—9 of Fig. 1;

Fig. 10 is an enlarged vertical section on the line 10—10 of Fig. 2;

Fig. 11 is an enlarged vertical section on the line 11—11 of Fig. 2;

Fig. 12 is an enlarged end view of the paper pan and the resilient support thereof;

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Fig. 13 is a bottom plan view of the elements illustrated in Fig. 12;

Fig. 14 is an exploded perspective view of the right end of the paper carriage assembly;

Fig. 15 is an exploded perspective view of the left end of the paper carriage assembly;

Fig. 16 is a top plan view of the resilient support for the paper pan assembly; and

Fig. 17 is a vertical sectional view on the line 17—17 of Fig. 16.

In the embodiment selected for illustration, the invention is shown as incorporated in a paper carriage assembly adapted for a typewriting machine of the portable type, although the invention is not to be understood to be limited in its utility to such type of machine.

The carriage assembly generally includes a platen roller 10 mounted on a shaft 11. The shaft 11 is journaled in bearings 12 supported by plates 13, carried rigidly by the upper face of an upper rail assembly member 14, the plates 13 being rigidly attached thereto and extending vertically upwardly therefrom at each end of said upper wall of the upper rail assembly.

The platen roller may be manually rotated by wheels 15 mounted, respectively, at each extremity of the platen shaft 11 or, alternatively, by a standard line spacing device. The line spacing device includes a ratchet wheel 16, carried by one end of the platen shaft. A conventional finger lever 17 is cooperatively associated with the ratchet wheel for imparting a step by step rotary movement to the platen. Inasmuch as the spacing means is of a conventional type, further description of the details of this construction is unnecessary to an understanding of the present invention.

The paper lock, release, and guide mechanism includes a paper pan in the form of a curved plate 20, having an elongated concave upper face. This paper pan is carried by the upper rail member of the carriage assembly, and is mounted to underlie the platen roller. The curvature of the plate 20 is such that, when in assembled relation with the platen roller, there will be a slight space between the upper face of the plate and the periphery of the platen roller, as best indicated in Figs. 10 and 11 of the drawings. The rear marginal area of the wall 21 of the plate 20 is deflected rearwardly, as shown in these illustrations, and both the front and rear edges of the plate are rounded, thereby avoiding any sharp surface from contacting with the sheet of paper when the sheet of paper is inserted and positioned in the machine.

The plate 20 has an elongated slot 22 in the

front segment thereof, which slot is centrally positioned in the median area of the plate. A second slot 23 is similarly formed in the rear segment of the plate and at each end of these slots are concave depressions 24 and 25, respectively. These depressions constitute seats or bearings for the respective pressure rollers. A pressure roller 26 is mounted in the front slot 22, and a pressure roller 27 is mounted in the rear slot 23. These pressure rollers comprise cylinders formed of rubber or other similar material, through which a metal shaft extends, said shaft projecting beyond the ends of the rollers to form trunnions which seat in the depressions 24 and 25, respectively, in such a manner as to revolubly support the pressure rollers 26 and 27. These rollers contact the platen roller 10, respectively, at the front and rear of the lower segment of the platen roller at the positions best shown in Figs. 10 and 11 of the drawings.

The paper pan assembly which carries the pressure rollers is resiliently supported by the top rail member of the carriage assembly in such a manner as to cause the rollers 26 and 27 to normally press against the platen roller.

The support for the paper pan assembly comprises a double arm spring plate having a central section 28, a U-shaped channel 29 formed therein at the median line of the plate, and laterally extending arms 30, which arms 30 extend downwardly and terminate in transverse plates 31, and on the outer edge of each of which is formed a downwardly projecting ear 32.

The central portion of the plate has its top face welded or otherwise securely attached to the bottom face of the paper pan on a central line thereof so that, when the paper pan assembly is mounted in place, the ears 32 will seat in openings 33 formed in the top plate of the upper rail assembly member in spaced relationship. The openings 33 are sufficient in diameter to permit slight longitudinal extension and retraction of the spring.

This structure permits the paper pan to be supported in assembled relation with the platen roller in such a manner that it will be resiliently urged upwardly toward the platen roller, the movement being in substantial parallelism therewith and, likewise, to be depressed with a similar movement. The upward movement of the paper pan assembly moves the pressure rollers 26 and 27 toward engagement with the platen roller, frictionally locking the sheet of paper therebetween. When the paper pan assembly is moved downwardly against the tendency of the supporting spring, the rollers 26 and 27 move out of contact with the periphery of the platen roller, which is a released position, permitting free movement of the paper sheet.

In adjusting the paper sheet, and during the movement of the assembly either upwardly or downwardly, the transverse plates 31 ride on the top face of the top plate of the upper rail member and serve as a guide to assure that the movement will be in a true vertical path, thereby maintaining the parallelism of the paper pan assembly with the platen roller. This action provides for uniform clearance between the pressure rollers 26 and 27 and the platen roller throughout their length.

The mechanism for operating the paper pan assembly to and from locking position to either permit free movement of the paper sheet during the adjustment of the same for printing operations, or to locked position for frictionally engaging the sheet of paper in feeding operation

is extremely simple in construction, but highly efficient in operation.

The actuating mechanism for this purpose comprises a bell crank lever 34 which is pivoted upon and is carried by a shoulder screw 35 threaded into the inner face of the right hand one of the plates 13 of the upper rail member of the carriage, and near the rear of the machine. The bell crank lever 34 has a finger arm 36 integrally formed with the upper arm of said lever, which finger arm projects upwardly and is inclined forwardly near the rear right corner of the upper rail assembly, so that it is positioned for convenient manual manipulation by the operator in effecting the adjustment of the paper lock and release mechanism.

A shaft 37 is mounted in the rear of the upper rail assembly and extends inwardly from the right end plate 13 to a point approximately at the center of the carriage and paper pan assembly. The outer end of the shaft 37 is pivotally supported in a bearing formed in the end plate 13, and the inner end of said shaft is pivotally supported by a bracket 38 secured to the top face of the top rail member. Near the inner end of the shaft 37 is an arm 39, which has formed integrally therewith a flat extension 40 that projects into the channel 29 formed in the central portion of the spring plate. There is a small amount of play between the surfaces of the extension 40 and its seat in the channel 29. This insures that spring pressure of the spring supporting the paper pan will be unrestrained from the train of release members by a lock fit of these parts. Furthermore, the extension 40 may be easily bent to insure a proper seating thereof in the channel 29.

On the outer extremity of the shaft 37, and rigidly secured thereto, is an arm 41, the upper edge of which constitutes a cam face with a detent or stop 42 at the base. The rearward extremity of the lower arm of the bell crank lever 34 is rounded and is formed to ride on the top face of the arm 41. Thus, when the finger arm 36 is depressed, the extremity of the lower arm of the bell crank 34 will cam against the top edge of the arm 41, thereby rocking the shaft 37 to the limit of the rocking movement thereof, which occurs at the point of contact when said bell crank lever arm engages against the detent shoulder 42. When the finger arm 36 is moved upwardly, the shaft 37 rocks in the reverse direction. A wrap spring 37*a* coiled on the shaft 37 between the members 38 and 40 serves to urge the member 40 upwardly and thereby hold the associated parts in lock position, avoiding vibration thereof during operation of the machine. The upward movement of said finger arm 36 is limited by an inwardly deflected lug 43, formed by bending a section of the upper edge of the plate 13 inwardly in a position so that the upper arm of the bell crank lever 34 will contact therewith before the lower end of said lever rides over the end of the arm 41.

The actuating mechanism for raising and lowering the paper pan assembly just described forms, in effect, a bail for translating rocking movement of the shaft 37 into a vertical movement of the paper pan assembly, the movement, as hereinbefore described, being accurately controlled to preserve a substantial parallelism between the pressure rollers and the platen roller. Thus, when the finger arm 36 is manually moved forwardly by the operator, the shaft 37 will be rocked counterclockwise, as viewed in Fig. 14, and, by the mechanism described, thereby draw

the spring plate 28—30 downwardly to clear the pressure rollers from the platen roller. In this adjustment, the sheet of paper is free to be manipulated into proper adjustment, after which the finger arm 36 may be snapped upwardly, causing engagement of the pressure rollers against the sheet of paper and holding it in frictional engagement with the platen roller.

Since the force for raising and lowering the paper pan assembly is applied at a central point longitudinally thereof and the spring pressure is applied and released at the approximate center of the length of the spring, the release movement prevents tilting of the paper pan assembly, and the reverse movement to locking position likewise prevents tilting of the paper pan assembly. Furthermore, since the extremities of the paper pan supporting spring with the top member of the upper rail assembly of the carriage is guided accurately, as hereinbefore described, a transverse tilting of the paper pan assembly during the adjustments thereof is prevented.

The paper feed mechanism also includes a bail whereby sheets of paper may be centered and either curved rearwardly against the platen or be permitted to extend vertically upwardly parallel with the front face of the platen.

This mechanism comprises a graduated bail rod 50 upon which are mounted spaced rollers 51 of conventional design. The bail rod is supported at each end by left and right arms 52 and 53, respectively. The lower ends of said arms are pivoted to the end plates 13 of the upper rail assembly of the machine carriage. Shoulder screws are threaded into said plates and constitute the pivot mountings for said arms. The upper ends of said arms 52 and 53 have respectively, inwardly extending sleeves 54 and 55 attached thereto, and the ends of the rod 50 are seated in said sleeves and adjustably secured therein by lock screws 56.

The bail may be rocked rearwardly to resiliently urge the rollers 51 toward the platen, or said bail may be moved forwardly toward a vertical position, in which adjustment the sheet of paper positioned in the rear of the rollers 51 will be held in a substantial vertical position and guided in a vertical path in the step by step feed thereof. The bail 50 is held in its rearward or its forward adjustment by springs 57, which are attached to spring posts 58, which extend outwardly from the face of each of the bail arms 52 and 53. Said springs, at their opposite ends, are each attached to a spring post 59 extending laterally from each of the plates 13. When the bail is moved forwardly over a center position, it is maintained in its forward position by abutment of the lower end of the arm 53 against the platen shaft bearing 12, and by the lower end of the arm 52 abutting against a stud 61 on the right hand plate 13. A push link 62 is pivotally secured to the arm 34 at 63. A screw 64 extends outwardly from the right plate 13 above the platen bearing 12, between which screw and bearing the push link extends and is thereby guided between the two elements. When the arm 34 is moved forwardly, the forward end of the push link 62 engages with the spring post 58, and moves the bail to forward position out of engagement with the platen roller. When the arm 34 is in rearward position, the bail may be snapped inwardly toward the platen, thereby holding the paper sheet against the upper forward segment of the platen during printing operations.

From the foregoing, it will be understood that the structure illustrated and described fully accomplishes the objects hereinbefore set out and, also, that while the structure has been described in detail, it will appear that modifications therein may be made without departing from the spirit or scope of the invention.

What is claimed is:

1. In mechanism of the kind described, a platen carriage including a shiftable upper rail member, a platen roller mounted in said rail member, a paper pan mounted between said member and said platen, rollers mounted in said pan to be shifted toward and from the platen roller, an elongated downwardly curved spring plate attached to the underface of said paper pan normally urging said pan upwardly toward said platen, means guidingly and removably mounting said spring plate directly on said upper rail member, and means for exerting downward pressure on said paper pan to force the same downwardly to released position in opposition to said spring plate.

2. In mechanism of the kind described, a platen carriage including a shiftable upper rail member, a platen mounted in said rail member, a paper pan mounted between said member and said platen, pressure rollers revolubly mounted in said paper pan, an elongated downwardly curved spring plate attached to the underface of said paper pan normally urging said pan upwardly toward said platen, means guidingly mounting said spring plate on said upper rail member including vertical projections entering spaced openings in said upper rail member and lateral plates positioned to ride across the upper face thereof, and means for moving said paper pan in opposition to said spring plate.

3. In mechanism of the kind described, a platen carriage including a shiftable upper rail member, a platen roller mounted in said rail member, a paper pan mounted between said member and said platen, rollers revolubly mounted in said pan and spaced circumferentially in respect to the lower segment of said platen roller, an elongated downwardly curved spring plate attached to the underface of said paper pan at the approximate longitudinal center line thereof normally urging said pan upwardly toward engagement with said platen, means guidingly mounting said spring plate on said upper rail member, and means for forcing said paper pan downwardly in opposition to said spring plate including a manually manipulative rock shaft, and an arm connected to said rock shaft and extending freely between said paper pan and said spring plate.

4. In mechanism of the kind described, a platen carriage including a shiftable upper rail member having spaced openings in the upper face thereof, a platen mounted in said member in spaced relation thereto, a paper pan comprising a curved plate having a concave upper surface positioned between said rail member and said platen, circumferentially spaced rollers mounted in and movable with said paper pan, an elongated downwardly curved spring plate attached to the underface of said paper pan formed to exert normal upward pressure on said pan towards engagement with the platen, means guidingly engaging the extremities of said spring plate with said upper rail member including downwardly extending projections at the extremities of said spring plate mounted in said openings in said upper rail member and being formed to shift endwise therein, and means for exerting downward pressure on said paper pan in opposition to said spring plate.

5. In mechanism of the kind described, a platen carriage including a shiftable upper rail member having spaced openings in the upper face thereof, a platen mounted in said member in spaced relation thereto, a paper pan comprising a curved plate having a concave upper surface positioned between said rail member and said platen, rollers mounted in said paper pan, an elongated downwardly curved spring plate attached to the underface of said paper pan positioned to exert upward pressure on said paper pan at the approximate center line thereof, means guidingly engaging the extremities of said spring plate with said upper rail member including downwardly extending projections at the extremities of said spring plate mounted in said openings in said upper rail member and being formed to shift endwise therein, and lateral projections contacting the upper surface of said upper rail member, and means for exerting downward pressure on said paper pan in opposition to said spring plate.

6. In mechanism of the kind described, a platen carriage including a shiftable upper rail member having spaced openings in the upper face thereof, a platen mounted in said member in spaced relation thereto, a paper pan comprising a curved plate having a concave upper surface positioned between said rail member and said platen, pressure rollers mounted in said paper pan, an elongated downwardly curved spring plate attached to the underface of said paper pan formed to exert normal upward pressure at the center line of said pan, means guidingly engaging the extremities of said spring plate with said upper rail member including downwardly extending projections at the extremities of said spring plate mounted in said openings in said upper rail member and being formed to shift endwise therein, and means for exerting downward pressure on said paper pan in opposition to said spring plate including an arm loosely connected with said paper pan on a line approximately at the center of the length of said spring plate and a manipulative device for rocking said arm.

7. In mechanism of the kind described, a platen carriage including a shiftable upper rail member having spaced openings in the upper face thereof, a platen mounted in said member in spaced relation thereto, a paper pan comprising a curved plate having a concave upper surface positioned between said rail member and said platen, pressure rollers mounted therein, an elongated downwardly curved spring plate attached to the underface of said paper pan formed to exert upward pressure on said pan at the approximate center thereof, means guidingly engaging the extremities of said spring plate with said openings in said upper rail member to prevent tilting thereof during movement, and means for exerting downward pressure on said paper pan in opposition to said spring plate.

8. In mechanism of the kind described, a platen carriage including a shiftable upper rail member, a platen mounted in said member in spaced relation thereto, a paper pan comprising a curved plate having a concave upper surface positioned between said rail member and said platen, pressure rollers mounted therein, an elongated downwardly curved spring plate attached to the underface of said paper pan formed to exert upward pressure on said pan at the approximate center thereof, means guidingly engaging the extremities of said spring plate with said upper rail member formed to prevent tilting thereof during movement, and means for exerting downward pressure on said paper pan in opposition to said spring plate including a shaft pivotally mounted on said upper rail member, an arm secured to one end of the shaft and loosely engaging the spring plate for downward movement thereof, a cam member secured to the other end of said shaft, and a manipulative member pivotally mounted on said upper rail member for engagement with said cam member.

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