Dec. 23, 1941. A. H. GUSTAFSON 2,267,197

LINE SPACING MECHANISM FOR TYPEWRITING MACHINES

Filed April 5, 1940 2 Sheets-Sheet 1

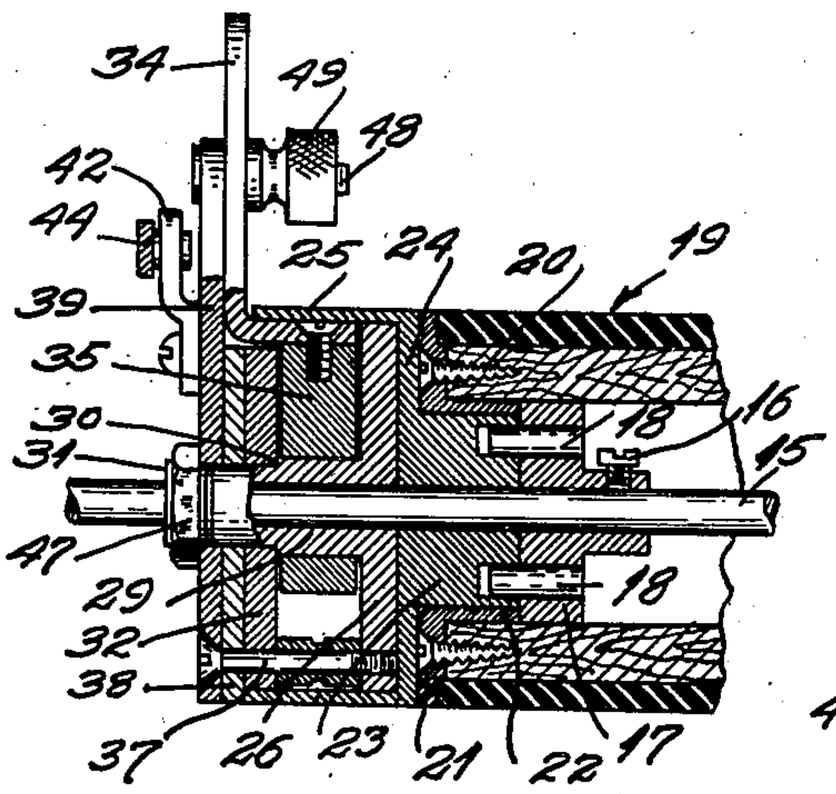

FIG. 3.

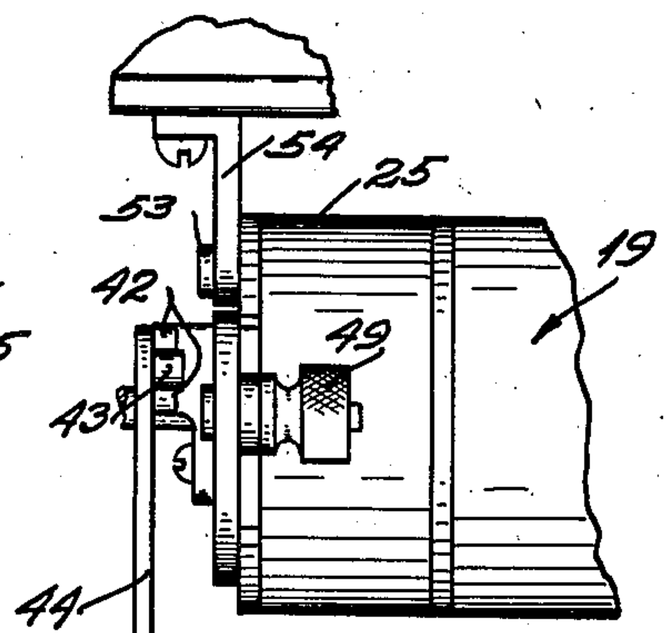

FIG. 1.

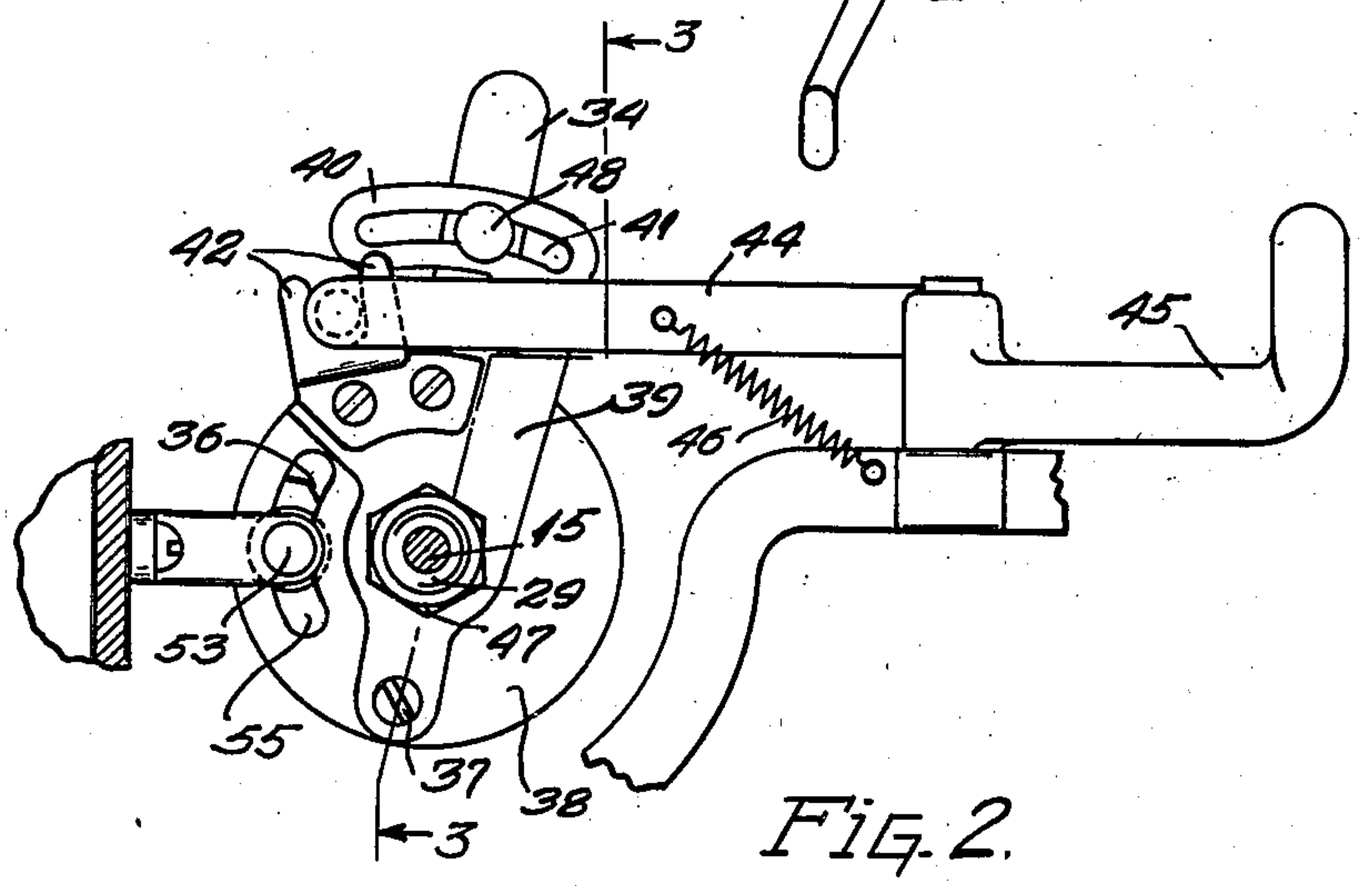

FIG. 2.

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LINE SPACING MECHANISM FOR TYPEWRITING MACHINES

Filed April 5, 1940 2 Sheets-Sheet 2

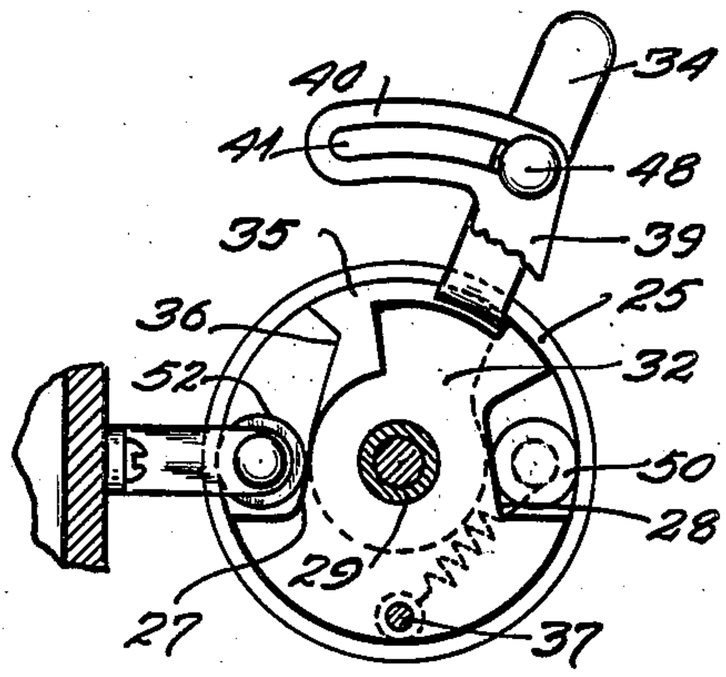

Fig. 4.

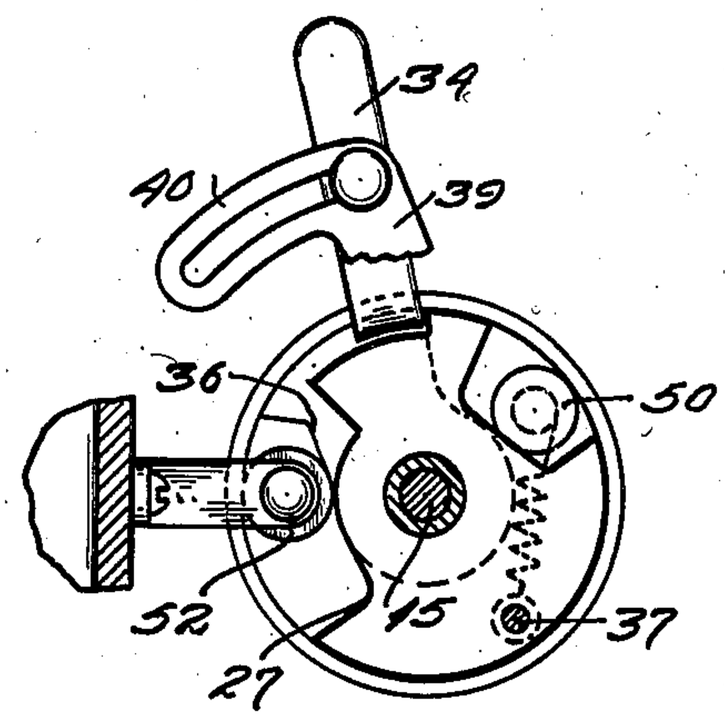

Fig. 5.

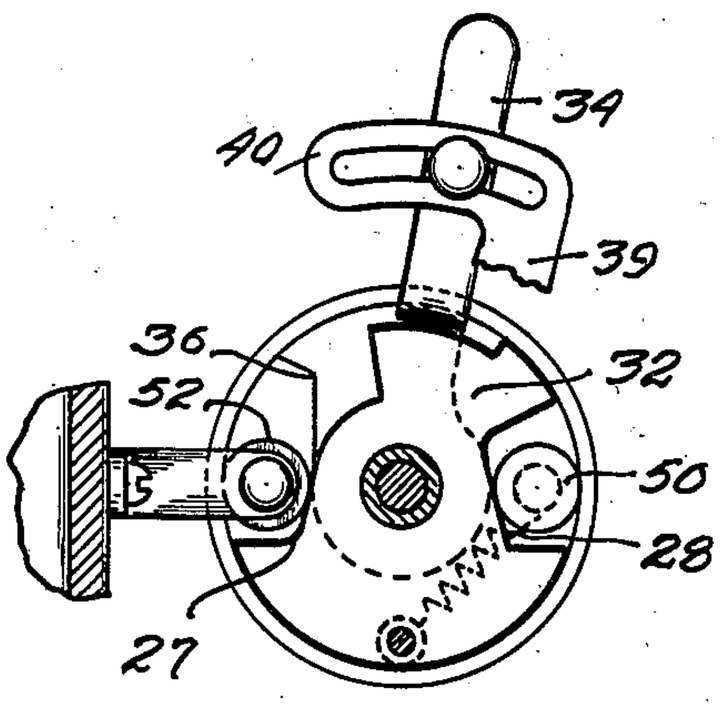

Fig. 6.

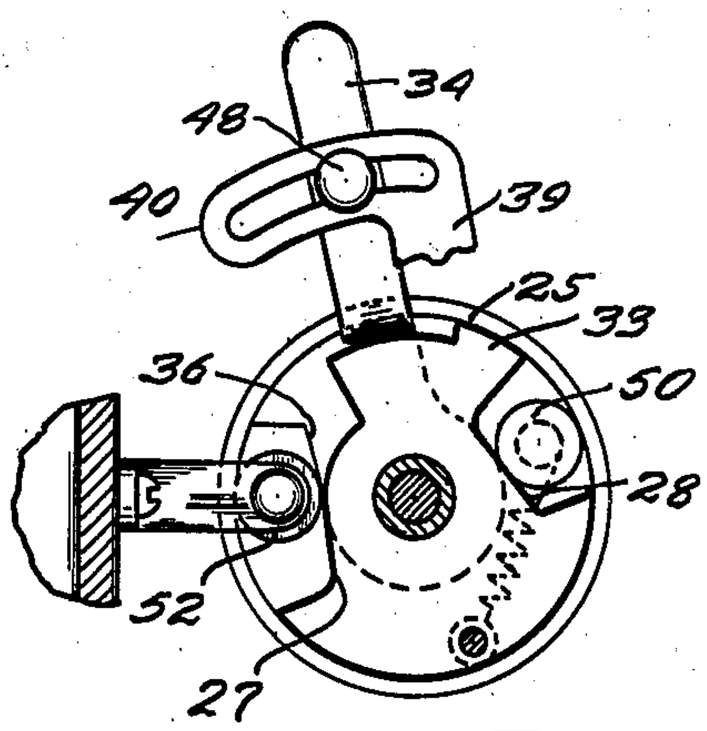

Fig. 7.

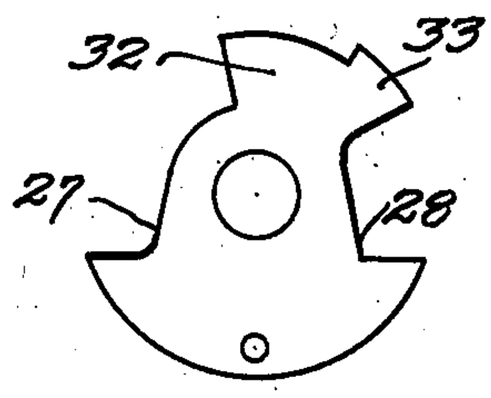

Fig. 8.

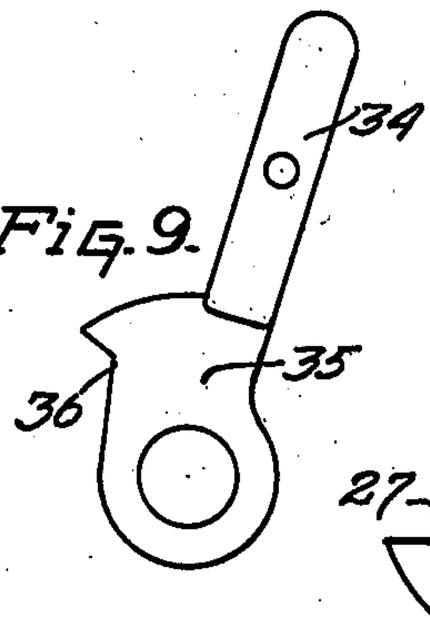

Fig. 9.

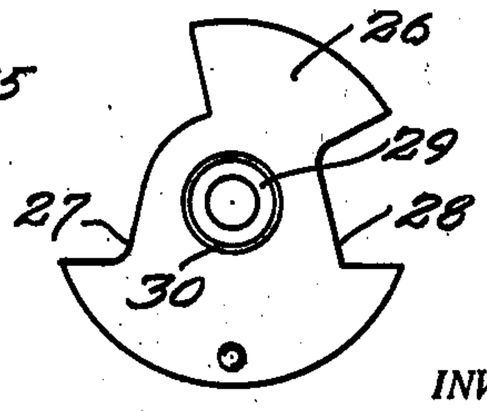

Fig. 10.

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2,267,197

UNITED STATES PATENT OFFICE

2,267,197

LINE SPACING MECHANISM FOR TYPEWRITING MACHINES

Arthur H. Gustafson, Denver, Colo.

Application April 5, 1940, Serial No. 327,980

12 Claims. (Cl. 197—114)

My invention relates to improvements in typewriters and is more particularly directed to a mechanism for imparting to the platen any selected degree of rotary movement.

The object of the invention relates to improvements in spacing mechanisms for typewriters and is more particularly directed to that type of mechanism which is noiseless in operation and one serving to impart to the platen any degree of movement.

Another object of the invention lies in the provision of means resembling in appearance the spacing mechanism now employed but embodying in its structure improved means whereby the platen may be variably spaced in its movements.

Still another object of the invention is to provide an improved clutch for the platen embodying frictionally gripping means whereby the platen may be moved to any desired degree and locked against any further movement.

Further objects of the invention will hereinafter appear, and to all of these ends the invention consists of the features of construction, arrangement of parts, and combination of elements, substantially as hereinafter fully described and claimed in the specification and shown in the accompanying drawings, in which—

Figure 1 is a top plan view showing a portion of the platen together with the spacing lever associated therewith.

Figure 2 is an end elevation of the mechanism disclosed in Figure 1.

Figure 3 is a sectional view on the line 3—3 of Figure 2.

Figures 4 and 5 disclose the clutching mechanism adjusted to move the platen to a certain degree.

Figures 6 and 7 are views similar to Figures 4 and 5 but showing the mechanism adjusted to give a shorter degree of movement of the platen, and

Figures 8, 9 and 10 show in detail the elements constituting the variable limiting means.

Briefly the invention hereinabout to be described is directed to a mechanism whereby the platen of a typewriter may be moved any desired degree. Ordinarily in typewriters at the present time a spacing mechanism is provided which embodies a ratchet wheel and engageable with this ratchet wheel are pawls whereby movement of the platen may be adjusted to what is commonly known as 1, 2 or 3 spaces and these spaces are fixed depending upon the ratchet employed. It is common to vary the ratchets for particular work but such ratchets cannot in themselves be regulated after having been affixed to the platen. It is therefore the purpose of this invention to provide means whereby the platen may be moved the equivalent of the present spaces or as many spaces as desired and these spaces in themselves might be regulated to the smallest degree. Thus, it is possible with a typewriter having a mechanism of the structure hereinafter described, to type upon work having lines of varying intervals, eliminating the usual ratchet on the platen.

Referring to the drawings in detail the numeral 15 indicates the shaft of the usual platen generally journaled for both rotary and axial movements in the shift carriage of a typewriter and as is commonly known this shaft has fixed to its extremities the usual hand turning knobs, not shown. It might be pointed out that the clutching mechanism hereinafter described is freely supported by the shaft 15 and adapted to transmit motion to the platen. Thus it is possible, as is common in all typewriters, to turn the platen either with the hand knobs or through the clutching mechanism and it is to be understood that the shaft 15 rotates at all times with the platen.

Positioned adjacent one end of the shaft 15 and affixed thereto by a binding screw 16 is the hub of a metallic disc 17 and as shown in Figure 3 this metallic disc is provided with a plurality of outwardly extending pins 18 for the purpose hereinafter apparent.

The metallic disc 17 is inserted within one end of a platen indicated at 19 and as shown in Figure 3 the platen has affixed thereto by suitable screws 20, an end face plate 21 having a flange 22 extending inwardly of the platen and against which the end of the disc 17 abuts. The platen 19 is, of course, of the usual structure comprising a cylindrical wood base and a covering of resilient material. The other end of the platen, not shown, is supported by means common in the art.

Also receivable on the shaft 15 and fitting within the flange portion 22 of the face plate 21, is a cylindrical hub 23 having on one face a plurality of openings within which the pins 18 are receivable. The other face of the hub 23 is provided with an outwardly extending flange 24 terminating into an annular flange 25 forming a housing within which a clutching mechanism hereinafter to be described is positioned. Thus it will be apparent that any movement imparted either to the shaft 15 or to the housing 25 will result in a corresponding movement of either the platen or the shaft.

For the purpose of convenience the annular flange 25 will hereinafter be referred to as the housing 25 and positioned within this housing are the elements constituting the clutching mechanism, such elements being shown in detail in Figures 8, 9 and 10. Positioned first within the housing 25 is one element of the clutching mechanism designated at 26 and it will be observed from Figure 10 that it is in reality a disc having at one side a cut-out portion forming a cam 27 and at the other side a relatively short cut-out portion forming a cam 28. As shown in Figure 3, this element 26 is provided with a central opening for the reception of the shaft 15 and surrounding this opening is an elongated hub 29 formed of two diameters having a shoulder 30 therebetween. The outer end of the reduced portion of the hub is threaded as indicated at 31.

Positioned upon the reduced portion of the hub 29 and abutting the shoulder 30 is a second clutching element 32 shown in detail in Figure 8, from which it will be observed that this element is identical in shape with the previously described element 26. The element 32 also includes the cams 27 and 28. It is, of course, to be understood that the cams 27 and 28 on both the elements 26 and 32 operate upon the same clutching elements hereinafter to be described. There is a slight difference between the element 32 shown in Figure 8 and the element 26 shown in Figure 10 and by comparing these two figures it will be observed that the element 32 is provided at its upper portion with a peripheral extension 33 against which an upwardly projecting lever 34 affixed to a segment 35 journaled about the hub 29 of the element 26 and positioned between the latter element and its corresponding element 32 is adapted to abut. As shown in Figure 9 this segment 35 is provided with a cam portion 36. From the foregoing description it will be apparent that when the segment 35 is moved in one direction by its operating lever 34 the base of the lever will engage the projection 33 moving the latter within the housing 25 and due to the fact that the elements 26 and 32 are connected by a tie bolt 37, both elements will move with the lever.

As further disclosed in Figure 3, positioned over the element 32 is a closure plate 38 to which is affixed in any desired manner but preferably by the tie bolt 37 a bracket 39 having at its upper end a curved arm 40 within which is formed concentrically with the axis of the platen a slot 41. Also affixed to the bracket 39 in any desired manner are outwardly and upwardly extending spaced fingers 42 between which a projection 43 is receivable, the latter being carried at one end of a bar 44 slidable within a part of the shift carriage and movable by a hand operated lever 45. As shown in Figures 1 and 2, the bar 44 is retained normally against one end of the lever 45 by a coil spring 46.

To tie all of the elements hereinbefore described together within the housing 25, the threaded extension 31 of the hub 29 has receivable thereon a nut 47.

As shown in Figure 3 the slotted arm 40 extends backwardly from the operator and falls in a plane adjacent to that of the lever 34. Passing through the slot 41, in the arm 40, is a locking screw 48 having thereon a thumb nut 49 by which the lever 34 might be locked in any desired relation with respect to the arm 40.

From the foregoing description it will be apparent that upon movement of the arm 45 the bar 44 will move backwardly and during this movement by its engagement with the fingers 42, all elements connecting to the bracket 39 are swung in one direction within the housing. It is during this movement of the elements within the housing that a gripping action is accomplished between the elements and the platen, thus rotating the platen upon movement of the lever 45.

As shown in Figures 4, 5, 6 and 7 positioned within the housing 25, and in the cut-out portions of the elements 26 and 32 forming the cams 28, is a roller 50 having wound around its central portion one end of a spring 51, the other end being connected to a sleeve positioned around the tie bolt 37. From this structure it will be apparent that the roller 50 is always drawn downwardly within the cams 28 by its spring, thus wedging itself between the cams 28 and the internal wall of the housing 25. With the roller in this position any movement of the elements 26 and 32 by the lever 34 will accordingly move the platen.

In order to regulate the amount of movement to be imparted to the platen, the lever 34 is adjusted with respect to the slotted arm 40 and when this adjustment occurs the cam 36 carried by the segment 35, shown in Figure 9, is moved toward or from the ends of the cams 27 carried by the elements 26 and 32. As shown in Figure 4, the lever 34 occupies the limit of its movement in one direction with respect to the slotted arm 40 whereupon the end of the cam 36 is moved as far from the cams 27 as possible. Positioned within this space formed between the cams 36 and 27 is a second roller 52 supported by a pin 53 carried by a rigid arm 54 forming a part of the shift carriage.

In Figure 6 the arm 34 occupies a position approximately midway of the arm 40 whereupon it will be observed that the cam 36 is moved toward the cams 27 reducing the length of the space within which the roller 52 is receivable.

As shown in Figure 2 the closure plate 38 is provided with a curved slot 55 permitting the passage therethrough of the pin 53 supporting the roller 52 and the movement of the plate with respect to the pin.

Assuming now that a typewriter equipped with a clutching mechanism hereinabove described has its adjustable elements regulated to the position shown in Figure 6, whereupon the platen is rotated a limited degree. The operator swings the lever 45 in the direction of the arrow whereupon the bar 44 is moved inwardly and during the movement of this bar 44, the bracket 39 is oscillated in one direction upon the shaft 15 carrying with it all of the elements within the housing 25. During this movement the roller 50 locks the housing 25 to the elements therein by reason of the cams 28 and movement of the elements with the housing by the lever 45 will impart a slight rotary movement to the platen, this rotary movement continuing until the cam 36 carried by the segment 35 binds upon the roller 52. Upon release of the lever 45 by the operator, the bar 44 is drawn outwardly by its spring 46 returning the elements within the housing 25 to their normal position, such position being limited by the cams 27 wedging the roller against the inner wall of the housing 25, thus locking definitely the platen in its adjusted position where it remains until the lever 45 is again swung by the operator in the direction of the arrow.

The same movements of the parts occur when the elements within the housing 25 are adjusted to the position shown in Figure 4 whereupon the

platen has a greater degree of movement than that shown in Figure 6, such movement being limited in one direction by the cam **36** and after the platen occupies that position the same being retained by the cams **27**.

From the foregoing description, it is therefore quite apparent that with the mechanism set forth it is possible to impart to the platen any degree of rotary movement desired, thus making it quite possible to type line after line with a minimum space therebetween or with the maximum space, such spaces being controlled by the relation of the cam **36** with the cams **27**.

It is further obvious that no definite ratcheting element is provided therefore eliminating the adjustment of the platen to any fixed degree.

It is quite apparent from the foregoing description that the cams **27** and **36** serve to definitely hold the platen in its new adjusted position and retain it in such a position until the actuating lever is again moved by the operator. In some cases the operating lever is given a very sharp blow by the operator, the result being that the platen over-rides its spacing mechanism. With the mechanism herein described the over-ride of the platen is prevented as it approaches its new position and also when the spacing lever returns to its normal position.

From the foregoing it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim is:

1. In a typewriter, the combination of a platen and shaft therefor, cam elements journaled for movement about the shaft and adjustably connected one to the other, a locking member movable by one of the cam elements serving to lock the elements to the platen when said elements are moved in one direction, and a device engageable by the respective cam elements for limiting the swing of the platen, said device also being actuatable by said cam elements into locking engagement with the platen for holding the same in its adjusted position.

2. In a typewriter, the combination of a platen and its supporting shaft, members swingable about the shaft and adjustably locked one to the other, said members having cam portions, a fixed member engageable by the cam portions of both members for limiting the swing of said members in either direction, a locking element, and a second cam portion carried by certain of the members and engageable with the element for locking the platen thereto so that movement of the members in one direction will impart a like movement to the platen.

3. In a typewriter, the combination of a platen and a shaft therefor, cam elements journaled for movement as a unit about the shaft, means adjustably connecting one element to the other, a locking member movable by one cam element serving to lock the element to the platen when said element is moved in one direction, and a fixed member engageable by the other of said cam elements to limit the movement of the platen.

4. In a typewriter, the combination of a platen and a shaft therefor, members swingable upon the shaft and movable one with respect to the other, means for locking the members together to swing as a unit, a clutching element operable by one of said members to move the platen upon movement of the members, a stop element engageable by the other of said members to limit the swing of the platen, and said stop element being moved by the first of said members to engage and hold the platen in its adjusted position.

5. In a typewriter, the combination of a platen and a shaft therefor, cam elements journaled for movement in an arc about the shaft, means operable by one cam element during its movement for engagement with the platen to move the platen therewith, a member engageable by the other of said elements to limit the movement of the platen, and said cam elements being adjustably connected one to the other to vary the length of the arc in which the platen moves.

6. In a typewriter, the combination of a platen and a shaft therefor, cam elements journaled for movement in an arc about the shaft, means operable during the movement of one cam element to grip the platen and move the same therewith, means engageable by the other of said cam elements to limit the movement of the platen, and said cam elements being selectively fixed one to the other to increase or decrease the length of the arc in which the platen moves.

7. In a typewriter, the combination of a platen and its supporting shaft, elements journaled upon the shaft and movable thereabout, said elements being locked one to the other, a cam portion carried by each of the elements, a fixed element engageable by the cam portions limiting the oscillatory movement of the elements about the shaft, and means actuated by one of the elements locking the platen thereto to move the latter during the swing of the elements in one direction.

8. In a typewriter, the combination of a platen and its supporting shaft, members journaled on the shaft and swingable within a certain arc, means locking said members in any adjusted relation, a cam portion carried by each of the members, a fixed member engageable by the cam portion of each member limiting the swing of the members in both directions, a second cam portion carried by one of the members, means operated by the said second cam portion to lock the platen to the member when the member is swung in one direction, and means for returning the members to the limit of one of their movements.

9. In a typewriter, the combination of a platen and its supporting shaft, members supported by the shaft and movable with respect to each other, means for locking said members in a fixed relation, a fixed element engageable by said members for limiting their swing in either direction about the shaft, and a clutching means actuated by one of the members and locking the platen thereto when the member is swung in one direction.

10. In a typewriter, the combination of the platen and its supporting shaft, members movable about the shaft and locked with respect to each other, a cam portion carried by each of said members, a fixed member engageable alternately by the cam portions to limit the swing of the members in either direction, an element actuated during the movement of the members in one direction to move the platen

therewith, and means returning the members to their normal position.

11. In a typewriter, the combination of a platen and its supporting shaft, a housing fixed to the platen, oscillatory means within the housing and lockable hereto for moving the platen in one direction, said means including two elements adjustably locked one to the other, a fixed device engageable by the elements to limit the movement of the means in both directions, and said fixed device including means operable by one of said elements and engageable with the housing to hold the platen in its adjusted position.

12. In a typewriter, the combination of a platen and its supporting shaft, elements supported by the shaft and movable thereabout, said elements being connected one to the other, a fixed element engageable by the elements and limiting their oscillatory movement about the shaft, and means actuated by one of the elements locking the platen thereto to move the latter during the swing of the elements in one direction.

ARTHUR H. GUSTAFSON.