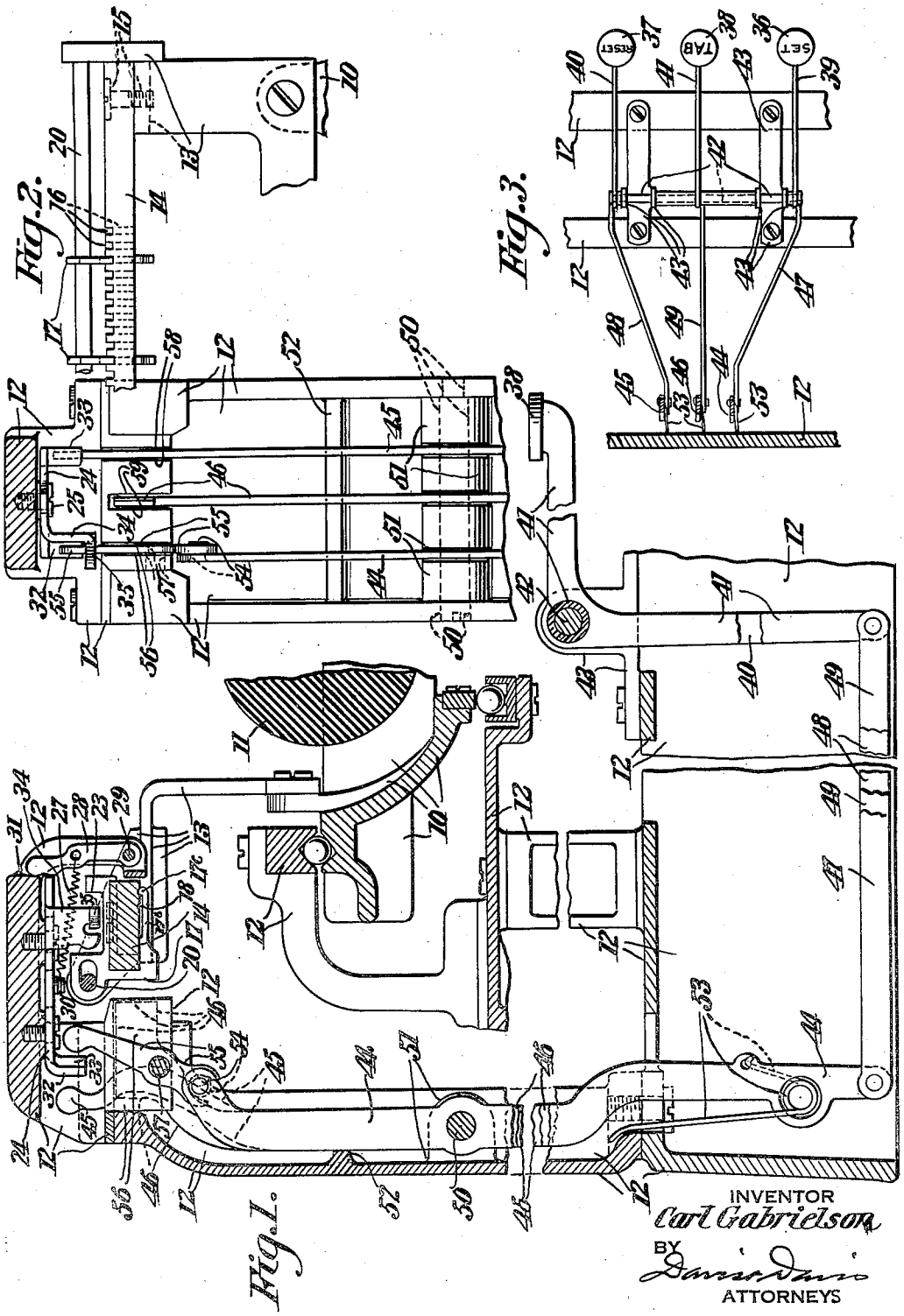
July 19, 1938. C. GABRIELSON 2,123,938

TYPEWRITING MACHINE

Filed April 28, 1936 2 Sheets-Sheet 1



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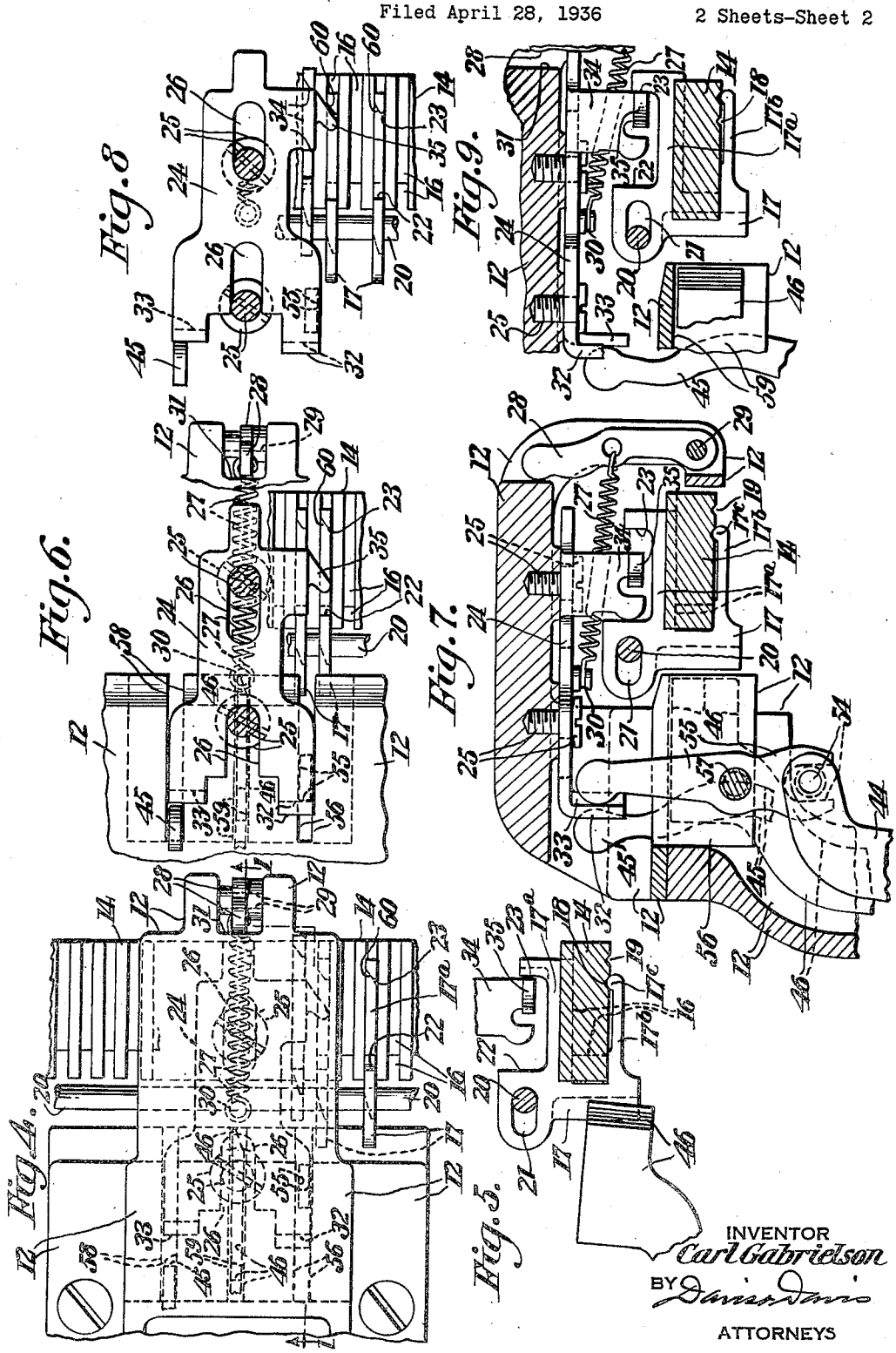

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2,123,938

TYPEWRITING MACHINE

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Application April 28, 1936, Serial No. 76,727

3 Claims. (Cl. 197—179)

This invention relates to improvements in typewriting machines and more particularly to the tabulating mechanism of such machines.

The principal object of the invention is to provide an improved tabulating mechanism of the key-set type and especially to provide a simple and efficient construction of tabulating mechanism wherein column stops mounted on the traveling platen carriage of the machine may be set and cleared or restored through the actuation of keys in the keyboard of the machine.

Another object of the invention is to provide improved key-controlled stop setting and clearing means by which column stops in a tabulating mechanism for a traveling carriage may be individually set and may be individually cleared or restored, and by which all set column stops may be cleared or restored if desired.

A further object of the invention is to provide in a typewriting machine having tabulating mechanism of the kind wherein column stops are mounted on the platen carriage of the machine a letter-space apart, a single stop setting and clearing device shiftable on the main frame of the machine by keys in the keyboard, by means of which device any desired column stop or stops may be set or cleared without affecting the positions of the other column stops, or, if desired, all set column stops may be cleared.

To the foregoing ends, and other ends which will appear hereinafter, the invention consists in the combinations of devices, arrangements of parts and features of construction set forth herein and particularly pointed out in the appended claims.

In the accompanying drawings, which illustrate the preferred embodiment of the invention—

Fig. 1 is a fragmentary vertical sectional view of a typewriting machine having the invention embodied therein, the section being taken approximately on the line 1—1 of Fig. 4, and the parts of the stop setting and clearing means being shown in neutral or idle position;

Fig. 2 is a fragmentary front view of the stop setting and clearing means, certain parts of the machine being broken away for clarity of illustration;

Fig. 3 is a detail view showing in plan the control key levers and keys of the tabulating mechanism, and also illustrating adjoining parts of the tabulating mechanism connected with said key levers;

Fig. 4 is a fragmentary top plan view of the rear portion of the machine, the illustrated parts of the stop setting and clearing means being positioned as in Fig. 1;

Fig. 5 is a detail vertical sectional view showing a set column stop on the carriage engaging a set counter stop on the machine frame to arrest a tabulating movement or jump of the carriage;

Fig. 6 is a view similar to Fig. 4, with part of the stationary framework of the machine broken away, but showing the stop setting and clearing device at the end of a stop setting movement thereof;

Fig. 7 is a sectional view on the same line as Fig. 1 but with the parts positioned as in Fig. 6, and

Figs. 8 and 9 are views similar respectively to Figs. 6 and 7, but showing the stop setting and clearing device shifted into stop clearing position.

The invention has been shown embodied in an L. C. Smith typewriting machine. The platen carriage 10 of the machine supports the platen 11 and is mounted on the stationary main framework 12 of the machine, as usual, to travel transversely of the machine and to be letter spaced from right to left under control of the usual escapement mechanism (not shown). Fixedly held to the carriage, adjacent opposite ends of the carriage, are two brackets 13 which support the respective ends of a column stop bar 14 with said bar extending horizontally transversely of the machine. At each end thereof the stop bar 14 is fixedly held to the adjacent bracket 13 by a screw 15. Except for the construction of the stop bar 14, the parts above mentioned are constructed substantially as in the L. C. Smith machine and as shown in my prior Patent No. 1,826,763, granted October 13, 1931. The improvements will now be described.

The stop bar 14 is of oblong cross section and is disposed with its wider faces in horizontal planes. A series of column stop spacing and guiding grooves 16, all lying in parallel vertical planes, are formed in the bar, each groove extending entirely across the rear and upper faces of the bar. The grooves maintain the column stops 17 on the bar spaced a letter space apart, there being one groove 16 for each letter space position of the platen carriage and a stop 17 for each groove, some of the stops having been omitted from the drawings for clarity of illustration. Each column stop has a body portion from which two superposed leg portions 17^a and 17^b extend forwardly, the body portion and upper leg portion 17^a being slidable in the guide groove 16 for the stop, and lower or latching leg portion 17^b extending under the stop bar and having a resilient front end portion which is slightly flexible up and down and is provided with an upwardly projecting nose 17^c which is adapted to snap into either of two parallel grooves 18 and 19 in the stop bar. Grooves 18 and 19 are formed in the under face of the bar and extend longitudinally of the bar, being spaced apart for engagement of nose 17^c in groove 18 in the set position of the stop and for engagement of nose 17^c in groove 19 in the clear or restored position of the stop.

Extending parallel to the bar 14, slightly above and to the rear of the bar, is a rigid rod 20 fixedly secured at its ends to the brackets 13. Each stop 17 has a short fore-and-aft extending closed horizontal slot 21 formed in its body part at a level above the stop bar 14, and the rod 20 extends through all of the slots 21 and serves to prevent accidental disengagement of the stops 17 from bar 14 and to assist in guiding the stops in their fore-and-aft sliding movement relatively to the bar. Preferably, also the slots 21 are just long enough for sufficient sliding movement of the stops to effect shifting of the stops from set to clear position. Leg 17a of each stop is cut out along its upper edge to form a notch in said edge affording two opposed vertical shoulders 22 and 23 for coaction with a fore-and-aft slidable stop shifting device 24 which is operable to set and clear the stops.

The stop shifting device, or stop setting and clearing slide, comprises a flat sheet metal plate or bar slidably held to shift fore-and-aft of the machine with said bar disposed flatwise in a horizontal plane. The plate or bar 24 is slidably held and guided by two fore-hand-aft spaced screws 25 to the under face of a portion of the main frame 12 which overhangs the column stop bar 14. Screws 25 are shouldered screws which pass up through different ones of two fore-and-aft extending aligned slots 26 in plate or bar 24 and are threaded into said overhanging portion of the main frame 12. At least one of the slots 26 is preferably closed at both ends and is of such length, as shown, as to coact with the screw 25 extending therethrough to arrest sliding movement of the plate 24 when the latter has moved a stop 17 to either set or clear position. Normally the plate 24 occupies a neutral or idle position midway between its stop setting and stop clearing positions, the ends of the aforesaid closed slot being (in the neutral position of the plate 24) equidistant from the shank of the screw extending through that slot.

Plate 24 is normally yieldingly urged to, and yieldingly held in, said neutral position by means of a contractile helical return spring 27 and a pivoted arm or lever 28. Arm 28 is pivoted at its lower end at 29 on the frame 12 to swing fore-and-aft of the machine. Spring 27 is connected at its rear end to plate or slide 24 at 30 and is connected at its front end to arm 28 at a point above pivot 29 and below the upper end of the arm. Spring 27 normally holds the upper end of arm 28 against a forwardly facing shoulder 31 on frame 12, and also normally holds the front end of plate or slide 24 against the rear edge of arm 28 adjacent the upper end of said arm.

At its rear end, plate or slide 24 is formed adjacent its left hand side with a pendant lug 32 and adjacent its right hand side with a pendant lug 33, said lugs being provided for coaction with key-actuated means for sliding the plate. At its left hand side, and adjacent its front end, the slide 24 is formed with a pendent lug 34 for shifting the column stops 17, which lug is disposed flatwise in a vertical plane extending fore-and-aft of the machine for engagement of the rear edge of the lug with shoulder 22 of a column stop and for engagement of the front edge of the lug with shoulder 23 of a column stop.

Lug 34 is of such width fore-and-aft that it is sufficiently more narrow than the spacing apart of shoulders 22 and 23 to permit both set and cleared stops to pass said lug during travel of the carriage while the slide 24 is in neutral position. The thickness of lug 34 is substantially equal to the stop thickness and said lug is so positioned as to register, in each letter space position of the carriage, with the column stop for that carriage position, as shown, for example, in Figs. 4, 6, and 8. At its lower end, lug 34 is formed with a stop shifting cam 35 which extends horizontally outward from the lug toward the left hand side of the machine and has a front cam edge which extends leftward and rearward from the front edge of the lug.

A column stop setting key 36, a column stop clearing or restoring key 37, and a counter stop setting or tabulator key 38 are provided in the keyboard of the machine, said keys being fixed respectively on the forwardly extending arms of bell-crank key levers 39, 40, and 41. Each of these key levers has a hub which turns on a pivot rod 42, which pivot rod extends horizontally transversely of the machine and is secured in brackets 43 affixed to the main frame work of the machine. Each bell-crank key lever has an arm pendant from its hub, and the pendent arms of the three bell-crank levers 39, 40, and 41 are respectively connected at their lower ends to the lower ends of three upstanding levers 44, 45 and 46 by links 47, 48, and 49 which extend rearward from the pendant arms of the bell-crank levers to the upstanding levers.

The upstanding levers 44, 45, and 46 are pivoted on a pivot pin or rod 50 which is secured to the main frame-work 12 of the machine and extends horizontally transversely of the machine through a boss 51 on said framework, said boss having suitable guide slots therein for the swinging levers 44, 45, and 46.

Normally, each upstanding lever 44, 45, and 46, above its pivot, is held rocked rearward against a stop rib 52 formed on the main framework 12, said levers being normally so held by return springs 53, which, as is obvious, also serve as return springs for the bell-crank key levers 39, 40, and 41.

Lever 44, at its upper end, has a pin-and-slot connection at 54 with the lower end of a short upstanding sub-lever 55, which sub-lever extends through a clearance and guide slot 56 in the framework 12 and is pivoted intermediate its ends in said slot at 57 to swing fore-and-aft of the machine when lever 44 is rocked. The upper end of sub-lever 55 is in fore-and-aft alignment with the pendant lug 32 on the slide 24 but is normally spaced forwardly from said lug. The lever 45 extends upwardly above its pivot through a guide and clearance slot 58 in framework 12, and the upper end of said lever is in fore-and-aft alignment with the pendant lug 33 on the slide 24 but is normally spaced rearwardly from said lug. The normal spacing of the upper ends of levers 55 and 45 from the pendant lugs aligned therewith is such that, upon depression of key 36, the slide 24 will be moved rearward to stop setting position by lever 55 without obstruction by lever 45, and that, upon depression of key 37, the slide 24 will be moved forward into stop clearing position by lever 45 without obstruction by lever 55, the slide being shifted respectively rearward and forward by said levers from its neutral position by thrust transmitted by the levers to the lugs aligned therewith.

The lever 46 constitutes the counter stop or frame stop with which the column stops on the carriage are coactive to arrest tabulating jumps of the carriage. The upper or column stop engaging end of stop lever 46 is guided in a slot 59 in framework 12 and is normally retracted within

said slot. Upon depression of key **38** the stop lever **46** is rocked to swing its upper end forward into the position shown in Fig. 5 in which said end protrudes from slot **59** into the path of travel transversely of the machine of the rear or main body parts of any set column stop or stops **17**, but not far enough to protrude into the path of travel of column stops which are in cleared position.

The platen carriage may be released from control of its escapement mechanism for its tabulating running movement, or, so-called, tabulating jump movement, from right to left, by any suitable means including, preferably, the carriage release means controlled by the carriage release key on the carriage of the L. C. Smith machine above referred to, and by means of a carriage release means operable by lever **46** and similar to that operable by the counter stops **27—28** of my prior patent hereinbefore referred to.

From the foregoing it will be obvious that, with the platen carriage standing in any letter space position, the column stop **17** for that position may be set by depressing and releasing key **36** and may be cleared or restored by depressing and releasing key **37**. Cam **35** does not affect the next adjacent stop to the left of that being re-set by lug **34**, as is obvious from Fig. 8 for example. When it is desired to clear or restore all set stops, key **37** is depressed and held down, and the carriage is then given a full return movement, whereupon cam **35** will successively cam all set stops forward into cleared or restored position, after which clearing of all set stops the key **37** is released. Preferably, for easy camming of set stops to cleared position by cam **35**, each column stop is beveled rearward and leftward from its right hand face to shoulder **23**, as shown at **60**.

What I claim is:

1. In combination, in a typewriting machine having tabulating means for a traveling carriage, an oppositely shiftable stop setting device, key-controlled means by which said device is shiftable selectively in either direction from a normal idle position and is returned to said idle position upon release of key-applied force, and a series of traveling column stops spaced a letter space distance apart and mounted for travel back and forth across the path of shifting movement of said device and also mounted for shifting of the stops across their said path of travel into operative and inoperative positions, said member having a stop-shifting finger and a stop-shifting cam, and each stop having two opposed portions with one of which said finger is engageable to shift the stop to operative position and with the other of which said finger is engageable to shift the stop to inoperative position, travel of the series of stops presenting the stops one at a time with their opposed portions positioned for engagement by said finger, said two opposed portions of each stop being arranged to freely pass said finger during travel of the series of stops whether the stops be operatively or inoperatively positioned and being spaced apart sufficiently to prevent shifting of a stop by said finger from either operative or inoperative position during return of said member to idle position, and said cam being effective on one of said opposed portions of each stop to cam operatively positioned stops successively into inoperative position when said member is held shifted in one direction out of idle position during travel of the series of stops in one direction past said member.

2. In a typewriting machine having a traveling platen carriage, tabulating mechanism comprising a series of column stops supported to travel with the carriage and for shifting of said stops individually relatively to the carriage transversely of the path of travel of the carriage into inoperative and operative positions, counter stop means for coaction with operatively positioned column stops to arrest the carriage, a column stop shifting member supported independently of the carriage for manual shifting of said member transversely of the path of travel of the carriage in opposite directions from a normal idle position of said member, in which idle position of said member both operatively and inoperatively positioned column stops clear said member during carriage travel, and means for restoring said member to its idle position when the member is relieved of manual force applied to shift the member in either of said opposite directions out of its idle position, each column stop having two opposed abutments spaced apart in the direction of shifting movement of the stop between the operative and inoperative positions of the stop, and said stop shifting member having a stop engaging and shifting portion which extends between the abutments of but a single one of the column stops at a time and is effective on one of said abutments to shift that stop to operative position and on the other one of said abutments to shift that stop to inoperative position, the abutment acted upon being determined by the direction in which the member is manually shifted out of its idle position and the spacing of the abutments being such that the stop shifted by said portion of the member remains in shifted position upon restoration of the member to idle position, and said member having a cam portion which, by shifting of said member out of idle position in one of its opposite directions of movement and holding said member so shifted, is presented for coaction with one of the abutments of each operatively positioned column stop carried past the cam during travel of the carriage in one direction to shift those stops successively into inoperative position.

3. In a typewriting machine having a traveling carriage and tabulating means for the carriage including a series of column stops individually settable in operative and inoperative positions and mounted to travel with the carriage, setting means for said stops comprising a single stop-setting member which is shiftably supported independently of the carriage for movements thereof in opposite directions from and back to a normal idle position from which said member is movable in one direction to operatively set a column stop registered therewith and from which said member is movable in the opposite direction to inoperatively set a column stop registered therewith, a lever fulcrumed at one end thereof independently of the member and carriage, a stop for the other end of said lever, and a contractile spring connected at one end to said member and its other end to said lever intermediate the ends of the lever, said lever being normally engaged with said member and stop at the same side of its fulcrum and being fulcrumed for swinging movement of the lever away from said stop by said member when the latter is shifted in one of said directions out of its normal position.

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