Jan. 24, 1956 H. L. WILLIAMS 2,732,055

TYPEWRITER PLATEN LOCKING DEVICE

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FIG. 1

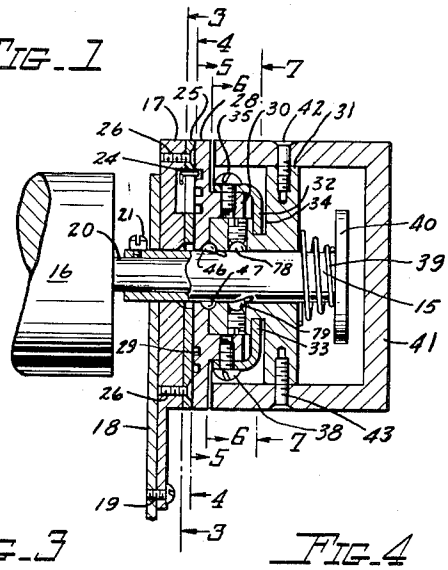


FIG. 2

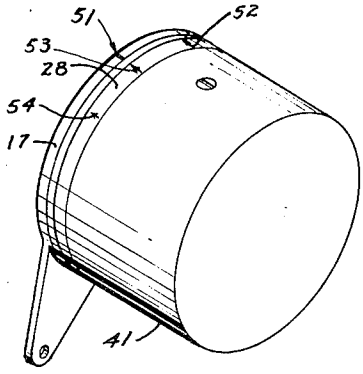


FIG. 3

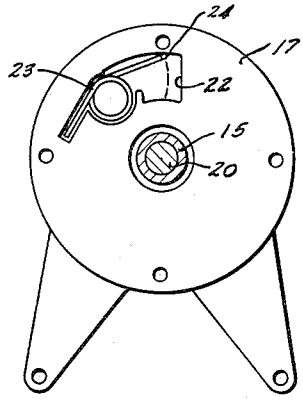


FIG. 4

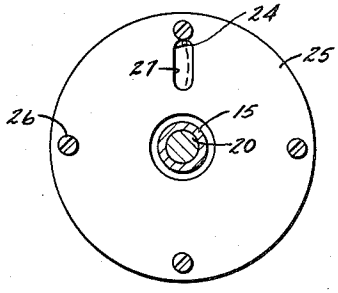


FIG. 5

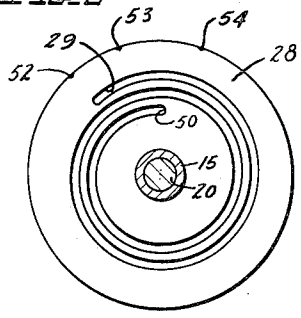


FIG. 6

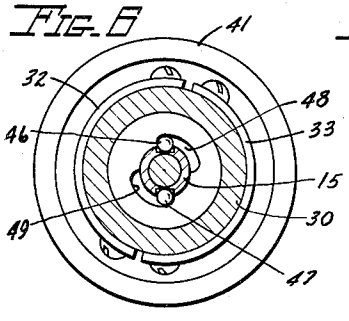


FIG. 7

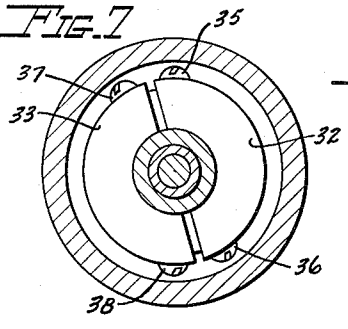
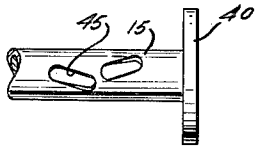


FIG. 8



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Fig. 9

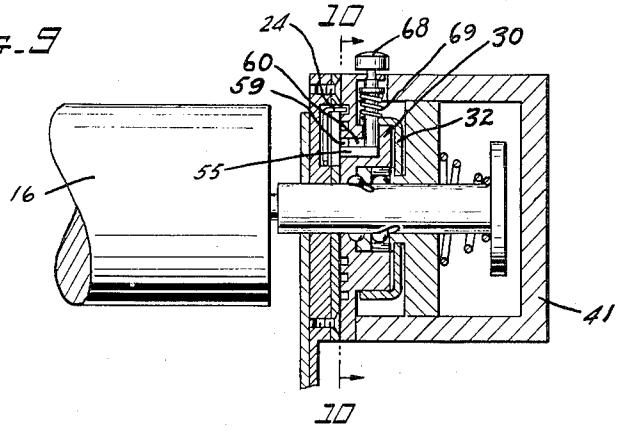


Fig. 10

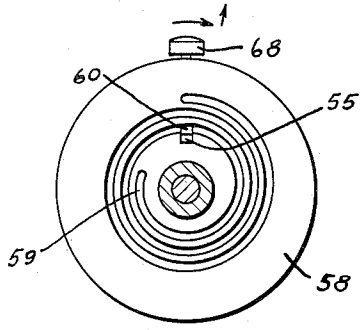


Fig. 11

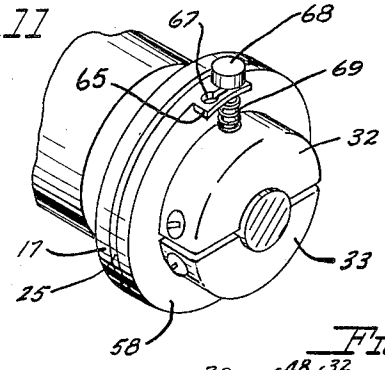


Fig. 12

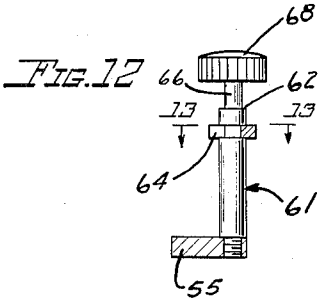
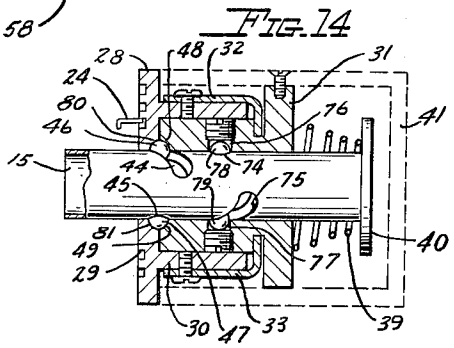


Fig. 13



Fig. 14



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United States Patent Office 2,732,055 Patented Jan. 24, 1956

2,732,055

TYPEWRITER PLATEN LOCKING DEVICE

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Application June 5, 1953, Serial No. 359,927

4 Claims. (Cl. 197—141)

This invention relates to an improved device for automatically locking the platen of a typewriter or other line-by-line record making machine, thus making it impossible for the machine operator to accidentally type too near the bottom of the sheet.

The primary disadvantage of previous devices of this type has been the difficulty in releasing the locked platen to remove the paper from the machine, as well as the difficulty of resetting the device so that a new sheet of paper can be positioned in the machine.

It is an important object of this invention to provide a platen locking device the working parts of which are enclosed in a small cylindrical housing which replaces one of the conventional hand knobs at one end of the typewriter platen, the housing thereafter serving in place of the conventional knob.

It is a prime object to provide a device of this type which is easily released, after it has locked the platen, by simply manually rotating the knob-like housing in the direction normally required to release paper from the typewriter, no outward pull on the knob being required, and no resetting of stop pins being required for the insertion of a new sheet of paper in the machine.

It is an additional object to provide a device of this type which can be manufactured as an attachment for typewriters and other record making machines presently in use, or which can be installed at the factory as an integral part of the machine without requiring design changes. When sold as an attachment, the device requires anchorage to the typewriter frame with only two small metal screws.

An additional object is to provide a platen locking device which can easily be set by the operator to lock to preserve a margin of desired length at the bottom of the sheet, whether the sheet is a conventional eleven inches in length, or is 14 inches in length.

The invention, together with other objects, will be more clearly understood when the following description is read in connection with the accompanying drawings, in which:

Fig. 1 is a central sectional view through a locking device embodying my invention, installed on the shaft of a typewriter platen, and on the typewriter frame, the platen and frame being shown fragmentarily;

Fig. 2 is a perspective view of a completely assembled platen locking unit embodying this invention;

Figs. 3, 4, 5, 6, and 7 are transverse sectional views taken respectively along the lines 3—3, 4—4, 5—5, 6—6, and 7—7 of Fig. 1, and show details of construction.

Fig. 8 is a fragmentary side elevation of a stub shaft, which is a part of the invention;

Fig. 9 is a sectional view of a modified form of the invention mounted on one end of a typewriter platen;

Fig. 10 is a sectional view taken along the line 10—10 of Fig. 9, and shows a modified form of a grooved plate which is a part of the invention;

Fig. 11 is a perspective view of a portion only of the

modified form of the invention, and shows details of construction and assembly;

Fig. 12 is a side elevation of a stop element, with parts in section;

Fig. 13 is a transverse sectional view taken along the line 13—13 of Fig. 12; and

Fig. 14 is a sectional view similar to Fig. 1 with parts omitted and parts distorted in proportion for clarity.

Generally, the invention includes a disc fixed to rotate with the typewriter platen, and having one of its side faces spirally grooved; a resilient traveler fixed to the typewriter frame and projecting into the spiral groove to travel therein as the platen rotates, and to stop platen rotation when the traveler reaches the end of the spiral groove; a housing for such mechanism in the form of a platen control knob; and mechanism connecting the knob and the spirally grooved disc to release the traveler from the spiral groove in the disc when the knob is turned in a direction to remove the paper from the typewriter.

Detailed description

The invention includes an assembly supporting stub shaft **15** secured coaxially on one end of the platen **16**. This shaft is rotatable in a plate **17** which is secured to the typewriter frame **18** by means of a screw **19**. Stub shaft **15** is locked to rotate with platen shaft **20** by means of a set screw **21**.

As clearly shown in Fig. 3, the outer face of plate **17** is machined to provide a recess **22** for receiving and seating a coil spring **23**, the outer end **24** of which projects outwardly at right angles, as in Fig. 1, and serves as a groove follower and stop. Its path of travel is indicated by the broken lines in Figs. 3 and 4. The spring **23** is held in position in its recess **22** by a thin sheet metal plate **25**, which is secured to plate **17** by means of screws **26**, the plate **25** having a slot **27** to provide free movement for follower **24**.

Shaft **15** carries a plate **28**, the inner surface of which is provided with a shallow spiral groove **29**, which is adapted to receive and guide the outer end of follower **24**. On its outer surface, plate **28** has an integral centrally bored boss **30** the bore of which journals the hub of a plate retracting member **31**, which is rotatable on shaft **15**. A pair of mating semi-circular angle section retainers **32** and **33** (Figs. 1, 6, and 7) have their semi-annular side flanges seated in an annular groove **34** in the journaled hub of member **31**. The retainers are held in position on boss **30** by screws **35**, **36**, **37** and **38**. This type of connection permits relative rotation between the plate **28** and the member **31**, while preventing relative axial movement. A coil spring **39** bears against the disc end of member **31** and against an integral head **40** carried by the outer end of shaft **15**. Spring **39** thus serves to normally maintain the spirally grooved surface of plate **28** against the adjacent surface of plate **25**, to thus maintain the end of follower **24** in the spiral groove **29**.

A cup-like platen knob **41** slips over the outer end of the described assembly as a housing, and its inner end is secured to the periphery of the disc end of member **31** by means of spaced countersunk screws **42** and **43**.

Knob **41** is indirectly and operably connected to plate **28** through plate retracting member **31**, a pair of diametrically opposite left hand spiral grooves **74** and **75** in shaft **15**, cooperating internal diametrically opposite recesses **76** and **77** in the hub of member **31**, and steel balls **78** and **79** seated in said grooves and recesses, as more clearly shown in Fig. 14. In addition, the connecting and plate operating means includes a pair of diametrically opposite right hand spiral grooves **44** and **45** in shaft **15**, cooperating substantially quarter-spherical recesses **80** and **81** in plate **28**, cooperating internal circumferentially extending grooves **48** and **49** (also see

Fig. 6) in the hub of member **31**, and steel balls **46** and **47** seated in the last mentioned grooves and recesses. As shown, grooves **48** and **49** are quarter-spherical in cross section and extend circumferentially through an arc of approximately 90° (Fig. 6). Normally the spring **39** maintains the respective mentioned parts in the relative positions shown in Figs. 1, 6, and 14, with the balls seated at the inner ends of the spiral grooves **44**, **45**, **74** and **75**, respectively, and the retracting member **31** at the limit of its counterclockwise travel with relation to the shaft **15** and plate **28**. The purpose of the described connecting mechanism is to simultaneously move the plate **28** counterclockwise slightly and axially outward on shaft **15** and away from groove follower **24** as a result of normal clockwise movement of knob **41** to remove paper from the typewriter. Such movement of plate **28** frees follower **24** from its groove **29**, and allows the follower to return to its normal starting position near the outer end of groove **29**.

Operation

When clockwise torque is applied directly to shaft **15** by platen shaft **20**, as a result of typing, plate **28** is forced to rotate with shaft **15**, the force being transmitted from the inner ends of grooves **74** and **75** to balls **78** and **79**, to plate retracting member **31**, and simultaneously from the side edges of the spiral grooves **44** and **45** to balls **46** and **47**, and thence to the walls of the recesses **80** and **81** in plate **28**. This direct application of clockwise torque thus acts on plate **28** just as if the plate were directly connected to the shaft. During this rotation of plate **28**, groove follower **24** follows spiral groove **29**. After a predetermined number of revolutions of the platen **16**, depending on the diameter thereof and the length of the paper being used in the typewriter, follower **24** reaches the inner end **50** of the spiral groove **29**, and the end of this groove, together with the instant immobility of follower **24**, prevent further rotation of the platen, thus arresting the movement of the sheet of paper in the typewriter. By making the groove **29** the proper length, considering the circumference of the platen and the length of the sheet of paper being used, this locking of the platen occurs when the last line of typing on the sheet of paper is a desired distance from the bottom edge of the sheet.

To release the platen to permit removal of the typed sheet from the typewriter, it is only necessary to grasp knob **41** and to rotate it manually in a clockwise direction. A slight rotation of the knob **41** accomplishes this release, without any need whatever for pulling outward on the knob. Due to the fact that shaft **15** is at the moment locked against clockwise rotation, clockwise rotation of knob **41** with consequent clockwise rotation of plate retracting member **31** causes balls **78** and **79** to move toward the respective outer ends of helical grooves **74** and **75**. This movement causes plate retracting member **31** to move axially outward on shaft **15**. Retainers **32** and **33** cause plate **28** to move axially outward on shaft **15** along with the retracting member **31**. Simultaneously balls **46** and **47** are forced to move toward the respective outer ends of their spiral grooves **44** and **45**, and since these last mentioned grooves spiral counterclockwise, the plate **28** is simultaneously forced to partially revolve counterclockwise. This counterclockwise movement of the plate **28** breaks contact between the extreme end **50** of spiral groove **29** and the groove follower **24**. The axial outward movement of plate **28** completely frees the follower **24** from the sidewalls of groove **29**, and permits follower **24** to return to its normal position, as shown in Figs. 3 and 4.

As soon as groove follower **24** is disengaged from spiral groove **29**, shaft **15** is again free to rotate clockwise. Continued clockwise movement of knob **41** forces shaft **15** to rotate clockwise, motion being again transmitted through the balls **78** and **79** and their respective grooves **74** and **75**. Almost simultaneous with the release of groove follower **24** from groove **29**, due to outward plate movement, coil spring **39** again returns the various parts to their respective normal positions, as shown in Figs. 1 and 14. Continued clockwise movement of knob **41** naturally frees the lower edge of the sheet of paper from the typewriter.

As is clearly shown in Fig. 2, fixed plate **17** is provided with a peripheral mark **51**, and rotatable plate **28** is provided with spaced peripheral marks **52**, **53**, and **54**, adapted to selectively register with mark **51**. The three marks on plate **28** serve to orient plate **28** and its groove **29** with relation to the stop **24**, to thus control the point at which the lengthwise travel of the typing paper is arrested, thus controlling the spacing of the last permitted line of typing from the bottom edge of the sheet.

For instance, if knob **41** is adjusted by the operator to cause mark **52** to register with mark **51**, and a sheet of paper is inserted into the typewriter with the plate **28** and the platen in the relative positions thus established, the platen will be permitted to travel farther rotationally than if the paper had been inserted into the machine with the marks **54** and **51** in register. Consequently, the paper will be permitted to travel a greater lengthwise distance as the platen rotates, and the last permitted line of typing on the sheet will appear nearer the lower edge of the sheet than if the paper had been inserted into the machine with the marks **54** and **51** in register. By thus varying the position of knob **41** just prior to insertion of the paper into the typewriter, the operator can predetermine the location of the last permitted line of typing with relation to the lower edge of the sheet.

It will be understood by those familar with this art that the total length of spiral groove **29** must be directly related to the circumference of the platen, and to the standard length of the sheets of paper which are normally to be used in the machine. If this invention is to be installed on a portable typewriter having a small diameter platen, the length of groove **29** would be much greater than if the device was to be installed on a machine having a large diameter platen, assuming the same length sheets of paper were to be used in both machines. Since the only change required is in groove length, the manufacturer will provide different plates **28** for different typewriters, and all such plates will be interchangeable.

In offices using the same typewriter for typing on both eleven inch and fourteen inch sheets of paper, a slightly different embodiment of the invention is provided. For such flexibility of use the length of the spiral groove **29** in plate **28** is made sufficient to take care of the fourteen inch paper, and a movable groove block **55** is provided to shorten the effective length of the groove when eleven inch paper is to be used in the typewriter. Figs. 9 to 13 inclusive illustrate this modified embodiment.

Referring to Fig. 10, it will be noted that spiral groove **59** is shown approximately 270° longer than the groove **29** in the Fig. 5 plate. This excess in length will vary with the diameter of the platen to which the device is attached, and should be sufficient to allow the necessary additional platen rotation to accommodate the maximum length sheet of paper which is to be used in the typewriter. At a point corresponding to the location of the inner end of groove **29**, plate **58** is provided with a radially elongated recess **60**, a portion of which intersects groove **59**. Block **55** projects longitudinally into this axially disposed recess, and is movable radially therein to either block groove **59**, and constitute a stop at that point for the groove follower **24**, or to clear the groove so that the follower may travel freely to the extreme end of the groove before stopping plate rotation.

As a means of controlling the radial movement and position of block **55** in its guiding recess **60**, the outer end of block **55** is threadedly connected to one end of an elongated trigger **61** (Fig. 12), which reciprocates longitudinally in a radial bore in boss **30** (Fig. 9) and a registering perforation in retainer **32**. The mentioned radial

bore in boss 30 communicates with the outer end of recess 60, and is slightly larger in diameter than trigger 61 to permit lateral movement thereof within the bore. Near its opposite and outer end trigger 61 is reduced in diameter as at 66 to form an annular shoulder 62. Just inside shoulder 62 the trigger body is provided with an annular groove 63 (Fig. 13) which is adapted to tightly receive a U-shaped washer 64.

Referring to Fig. 11 it will be seen that a plate 65 is either made integral with or secured rigidly to the rim of plate 58. Plate 65 is provided with a key hole type slot the larger portion 67 of which will freely receive the larger diameter body portion of trigger 61. The narrow portion of this key hole slot will slidably receive the trigger shank 66, but will not admit the larger diameter portion of the trigger. A push button 68 is threaded on the extreme outer end of trigger 61.

In assembling this groove block control, block 55 is first inserted in recess 60. Trigger 61 is then inserted in the radial bore in boss 30, and is screwed tightly into the block 55. A coil spring 69 is then slipped over the outer end of the trigger, compressed slightly, and washer 64 is then slipped into its groove 63 to hold the spring compressed. Button 61 is then screwed on the outer end of the trigger.

By manually moving button 68 to the left in Fig. 11, shoulder 62 is aligned with slot portion 67, and spring 69 moves the trigger outward through the slot until washer 64 contacts plate 65. Simultaneously block 55 is moved radially outward and its inner end blocks groove 59. With the groove block in this position, the platen 16 is permitted to rotate a sufficient number of revolutions to accommodate the minimum length sheet of paper to be used.

When the maximum length paper is to be used, trigger 61 is moved inward by pressure on button 68 until shoulder 62 moves beneath the lower surface of plate 65. The button is then moved to the right in Fig. 11, causing shoulder 62 to pass beneath the narrow portion of the key hole slot. Plate 65 thus serves to temporarily maintain the trigger at the inner end of its permitted stroke, in which position groove block 55 lies outside groove 59, and does not interfere with the travel of stop 24 to the extreme inner end of the spiral groove.

It will thus be seen that the invention provides a simple attachment for typewriters which will prevent the operator from typing too near the bottom of a sheet of paper, even though different sheet lengths are used in the machine.

Having described the invention with sufficient clarity to enable those familiar with this art to construct and use it, I claim:

1. Pre-settable delayed action mechanism for arresting the rotation of the platen of a typewriter after the typing operation has caused the platen to rotate through a selected number of degrees, comprising: a shaft connected to and extending axially from one end of the typewriter platen; a plate mounted on and rotatable with said shaft in a plane normal to the shaft axis, said plate having a spiral groove in one side surface surrounding said shaft; and a groove following stop mounted on the typewriter frame and projecting therefrom into the spiral groove in said plate, whereby as the platen and plate rotate during the typing operation and the end of the spiral groove contacts said stop, further rotation of the platen is prevented by such contact; a manually operable knob mounted on said shaft adjacent said plate; and means operably connecting the knob to said plate for moving the plate axially along the shaft away from said stop in response to slight rotation of the knob, for the purpose of unseating the stop from the spiral groove to release the platen.

2. Pre-settable delayed action mechanism for arresting the rotation of the platen of a typewriter after the typing operation has caused the platen to rotate through a selected number of degrees, comprising: a shaft connected to and extending axially from one end of the typewriter platen; a plate mounted concentrically on said shaft in a plane normal to the shaft axis, said plate having a spiral groove surrounding said shaft in that side surface facing the typewriter; a grove following stop movably mounted on the typewriter frame and projecting therefrom into the spiral groove in said plate, said stop normally occupying a position substantially normal to the grooved face of said plate, and movable in a substantially radial direction only with relation thereto; a plate retracting member carried concentrically by said shaft adjacent the ungrooved side surface of said plate; means connecting the plate to the retracting member for relative rotation; and means connecting the shaft to the plate and to the retracting member to cause all three to rotate as a unit when the shaft is rotated during typing, said last mentioned means being operable to move said plate axially along the shaft away from said stop in response to rotation of the retracting member about said shaft.

3. The mechanism described in claim 2, and a housing rigidly secured to said retracting member and constituting a hand knob for rotating the retracting member.

4. The mechanism described in claim 2, and a compression coil spring on said shaft bearing against the outer end of said retracting member, and urging said retracting member and said grooved plate toward said stop.

References Cited in the file of this patent

UNITED STATES PATENTS

1,304,458	Darr	May 20, 1919
1,407,071	Larsen	Feb. 21, 1922