Oct. 30, 1951 R. HULL 2,573,023

PAGE END SIGNAL FOR TYPEWRITERS

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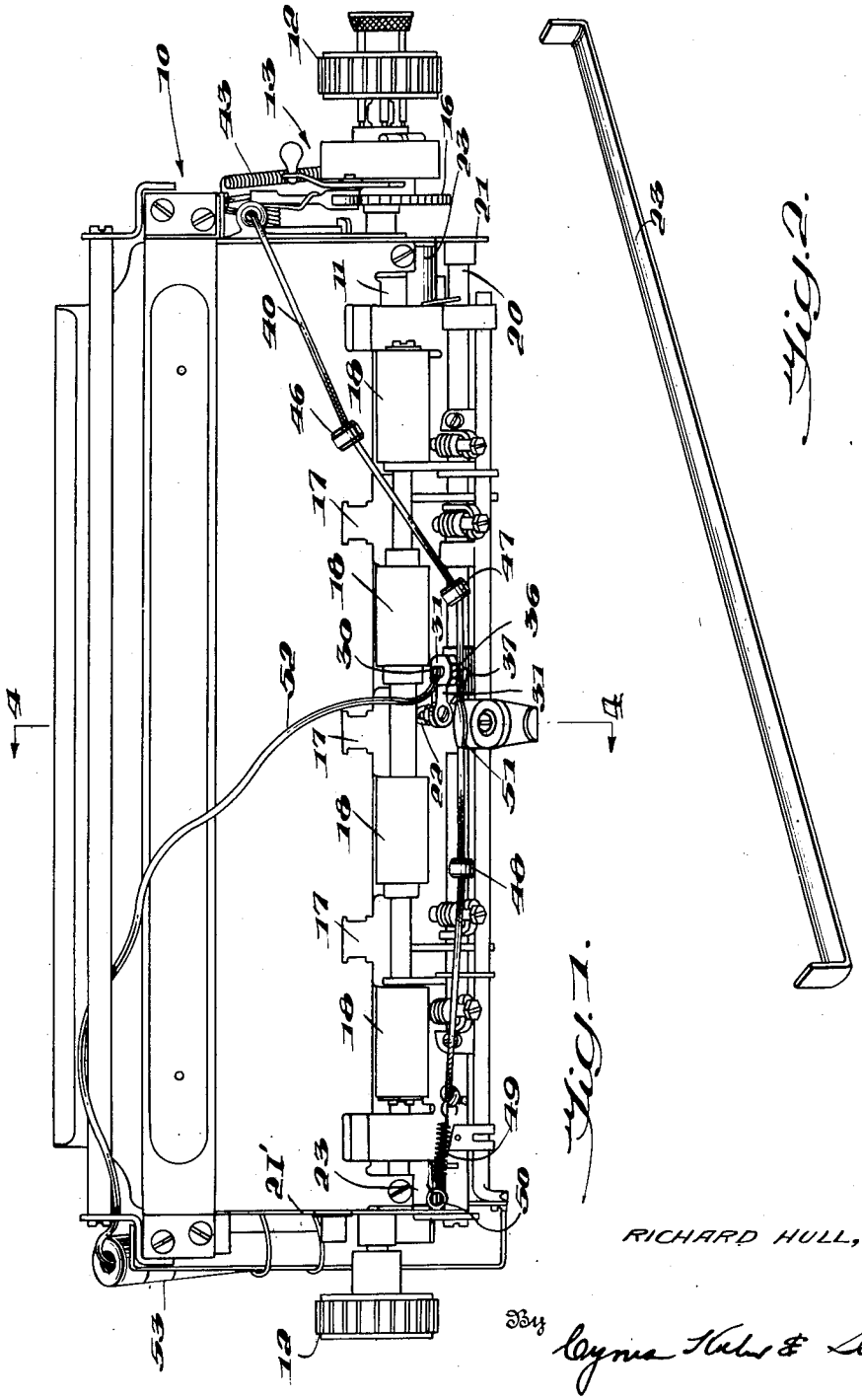


Fig. 1.

Fig. 2.

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Fig. 3.

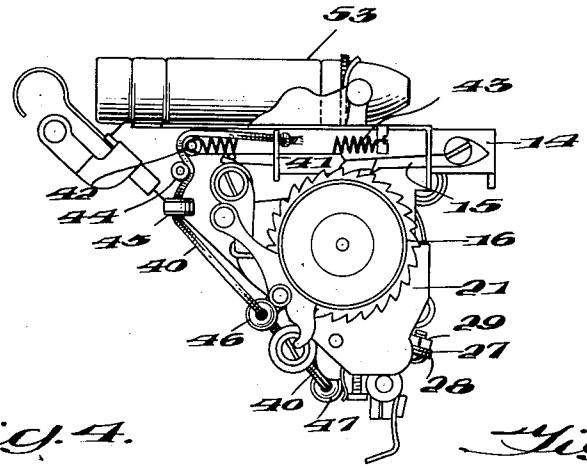


Fig. 4.

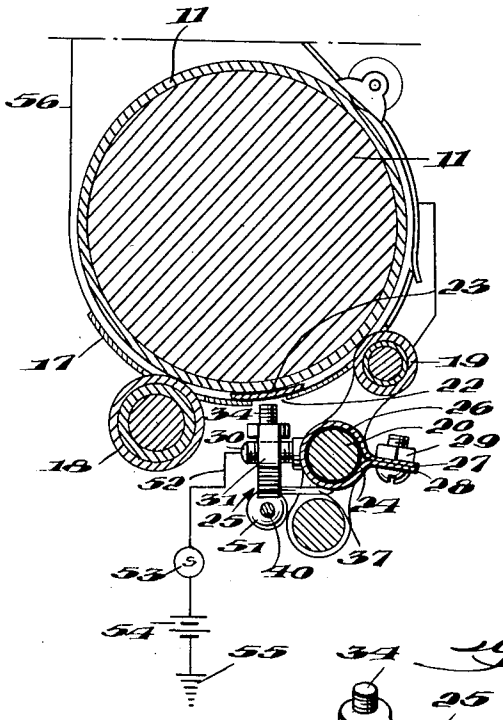


Fig. 5.

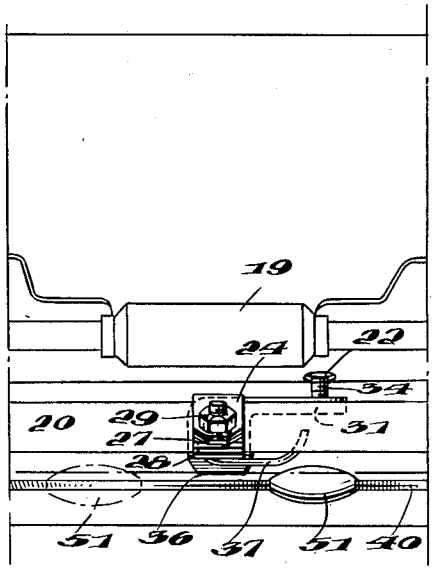
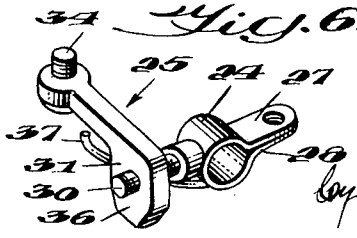


Fig. 6.



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Fig. 8.

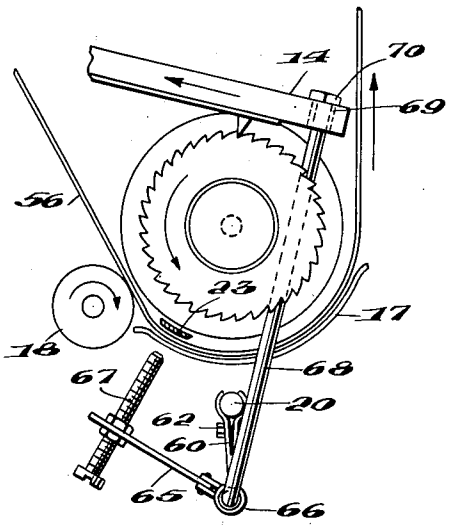


Fig. 9.

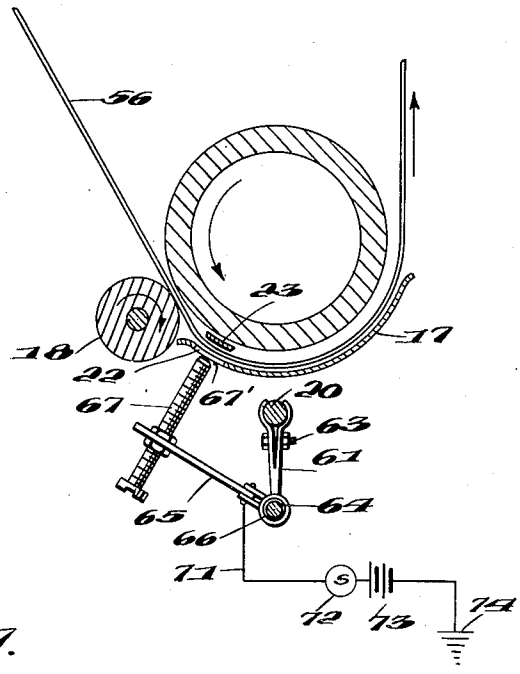
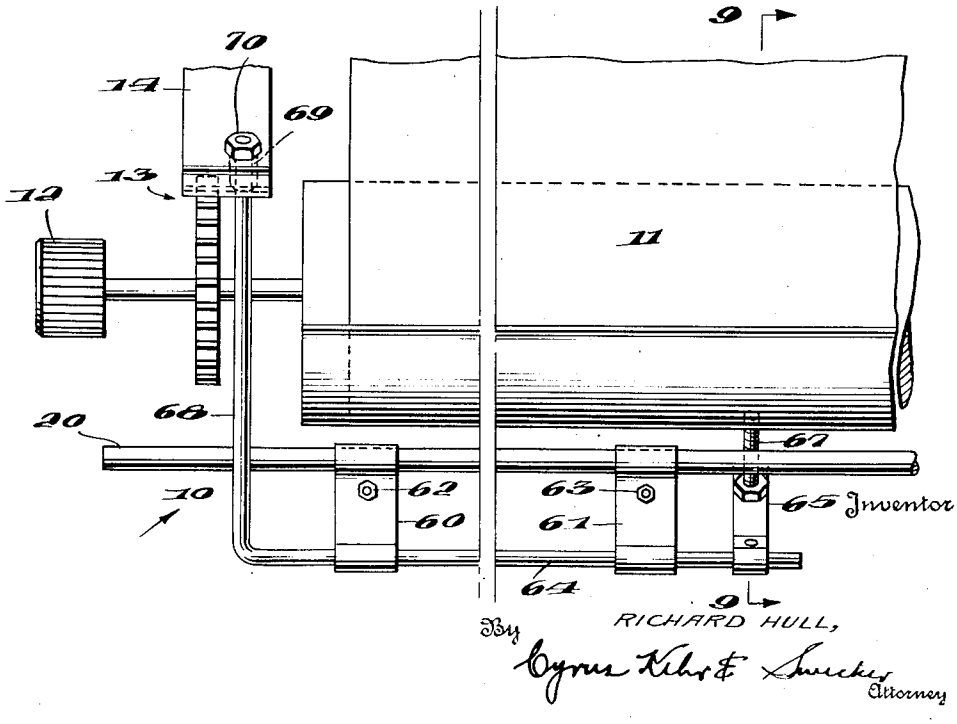


Fig. 7.



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PAGE END SIGNAL FOR TYPEWRITERS

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Application December 12, 1947, Serial No. 791,291

7 Claims. (Cl. 197—189)

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This invention relates to improvements in page end signals for typewriters that indicate to the operator when the end or bottom of the sheet is approaching a certain position in relation to the junction of the keys and the platen, and relates particularly to signals which are operated electrically.

Heretofore devices of this type have been provided with some means such as an electrical contact or contacts associated with the platen of a typewriter and a second contact, usually on the carriage, which is designed to make electrical contact with the first-mentioned contact, but is prevented from doing this by means of the insulating quality of the paper in the typewriter as it is moved between the contacts and on the platen. Consequently, when the end or bottom edge of the paper has reached a certain point on the platen, and incidentally a point beyond the point on the platen associated with the electrical contacts, the paper has passed from between the contacts, thus allowing them to become closed.

A further object of this invention is to provide an improved electric signal for typewriters which overcomes the above objections, by providing contacts which normally remain open or separated and are only momentarily urged into a closed position by the return action of the roll advance and carriage return mechanism after the paper has been advanced.

Another object of this invention is to provide an electric signal contact which indicates the approach of the end of the paper in a typewriter which only is urged into a closed position and in contact with the paper when the paper is stationary on the platen roll and after the advance of the paper has taken place.

A still further object of this invention is to provide an electrical signal which indicates the approach of the end of the paper in a typewriter to the operator and which only momentarily closes the circuit of an electric signal after the actuation of the roll advance and carriage return mechanism but does not have to be disconnected manually after the circuit has been closed, and does not have to be re-set for each new sheet of paper.

A further object of this invention is to provide an improved signal which indicates the approach of the end of the paper in a typewriter which is simple, economical to manufacture, and which can be adapted to be installed upon any standard typewriter.

The invention is illustrated in certain embodiments, in the accompanying drawings in which:

Fig. 1 is a rear plan elevational view of one type of a conventional typewriter carriage equipped with my improved sheet end signal;

Fig. 2 is a perspective view of the ground contact strip associated with the platen roll;

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Fig. 3 is an end plan elevational view of the typewriter carriage showing the linkage which connects the switch operating mechanism to the platen roll advance mechanism;

Fig. 4 is a cross sectional view taken on the line 4—4 of Fig. 1, showing also a diagrammatic wiring for the electric signal;

Fig. 5 is an enlarged front bottom plan view of a portion of the carriage showing the details of the switch;

Fig. 6 is a perspective view of the switch;

Fig. 7 is a rear plan elevational view of one type of a conventional typewriter carriage equipped with a modified form of my improved sheet end signal;

Fig. 8 is an end plan elevational view of the carriage, shown in Fig. 7; and

Fig. 9 is a cross sectional view of the carriage shown in Fig. 7, taken on the line 9—9 therein.

Referring now to the drawings, wherein for the purpose of illustration is shown one embodiment of this invention, in Fig. 1, the numeral 10 designates generally a typewriter carriage which has a conventional platen roll 11 (shown in Fig. 4), a conventional manual platen roll knob 12, and conventional platen roll advance mechanism designated generally as 13. Operating the platen roll advance mechanism 13, is a bar or slide 14 (shown in Fig. 3), which is actuated by a conventional platen roll advance lever (not shown). The platen roll is advanced in the usual manner by means of a pawl 15, coacting with a ratchet 16, which turns the platen roll, one, two, or three spaces with each movement of the bar 14.

The customary paper pan 17 lies below the platen roll 11, and operating through holes in the pan 17 are pressure rollers 18 and 19. The typewriter carriage 10 also contains the usual numerous adjusting and tensioning mechanisms, roller bearings, stops, guides, and the like, all of which are conventional on the typewriter and which need not be described in detail.

In the form of typewriter shown to illustrate this invention, there is provided directly below the platen roll 11, a rod 20 which is carried at each end by frame members 21 and 21'.

In order to assemble my improved signal on the typewriter carriage, a hole 22 is first drilled through the paper pan 17, as shown more clearly in Figs. 1, 4 and 5. The purpose of drilling this hole in the paper pan 17 is to permit access through the pan of an electrical contact, which will be described in detail later.

A ground electrical contact strip 23 is affixed by soldering, welding, or the like, between the frame members 21 and 21', and is located just below and closely adjacent to the platen roll 11, as well as between the paper pan 17 and the platen roll 11, as best shown in Fig. 4. The ground contact strip 23 being welded or soldered to the

frame members 21 and 21', obviously will be grounded to the typewriter carriage. This strip 23 becomes one contact of an electrical switch, and as shown in Figs. 4 and 5, the strip 23 must of necessity, be located fully over the hole 22 in the paper pan 17.

It is to be understood that, while I have illustrated and shown the ground electrical contact strip 23 extending the full length of the platen roll and welded or soldered in a ground connection to the frame members 21 and 21', that the platen roll itself may be made of an electrically conductive rubberized material or may be provided with an electrical ground band, if so desired, which in itself will act as a contact and the strip 23 may be omitted. The electrical ground contact strip 23 is also shown as extending the full length of and slightly beyond the platen roll 11, in order to permit free passage of the paper around the platen roll and between the contact strip 23, and the paper pan 17.

Attached to the supporting bar 20, by any suitable means, such as by a clamp 24, is a pivoted contact switch generally designated as 25. This contact switch 25 is insulated from the support bar 20, by means of rubber or other suitable insulation 26, as can best be seen in Fig. 4. The clamp 24 is adjustable and may consist of two arms 27 and 28, held together by a nut and bolt 29. It has been found desirable to use such an adjustable clamp for the reason that this permits simple, easy assembly of the clamp onto the bar 20, and permits a sliding adjustment of the clamp longitudinally of the bar to take care of variations in structure of different typewriters.

Carried upon the clamp 24 is a projecting member or pivot bar 30. This projecting member 30 may be formed integrally with the clamp 24, or may be welded or soldered thereto, as desired. Pivotally mounted on the projection 30 is a swinging member or arm 31, which is fixed at one end, as by screw threads, on the projection 30 to simplify the construction thereof. However, it is to be understood that the swinging member 31 may be of any shape or configuration desired, and may be carried upon the projection 30 in any desired manner, so long as it is provided with some form of bearing that will permit swinging thereof, but will not allow the swinging member to move laterally appreciably on the projection 30.

The opposite end of the arm 31 is threaded to receive a screw 34, the end of which forms a contact thereon, as shown in Fig. 6. The contact member 34 is in position to engage the contact strip 23, as shown in Fig. 4.

The swinging arm 31 is provided with a cam 36 on the under side thereof, at one end, as best shown in Fig. 6. A movement limiting arm 37 is also provided on the collar 24, as shown in Fig. 5, and is positioned so as to support the arm 31 when in its downward-most position. The purpose of this movement limiting arm 37 is to act as a stop or rest for the arm 31 and to limit its movement in one direction, so that the arm 31 cannot drop below a certain point and interfere with other mechanisms on the carriage. This arm 37 preferably is made of somewhat rigid wire and may be adjusted by bending when the switch 25 is installed upon the carriage of the typewriter.

The bracket 24 is mounted on the bar 20, so that as the contact 34 swings about the projection 30, it passes into and through the hole 22. This permits engagement between the ground contact 23, and the contact point 34.

Turning now to the switch operating mechanism, attention is first directed to Fig. 3. As shown, a cable 40 is connected at one end to a lug 41, affixed to the end plate 21. The cable 40 then passes around a guide bearing 42, mounted upon an anchor or pin carried on the arm 14, to which one end of a conventional return tension spring 43 is affixed. The cable 40 then passes over a second guide bearing 44, and down through guide eyelets 45, 46, 47 and 48, and is attached at its opposite end to a spring 49, which in turn is anchored to the frame member 21' by an eyelet 50. The cable 40 passes directly beneath but is spaced from the cam portion 36 of the arm 31.

Firmly affixed to the cable 40, is an operating member, such as an enlarged lug 51. This lug 51 may be made of any material desired, but preferably should be of a material which is adapted to resist wear, and it has been found that lead proves very satisfactory. The lug 51 is secured on the cable 40, intermediate the ends of the cable and adjacent the cam portion 36, but is located on the cable 40, in such position that when the cable 40 is in its normal or inoperative position, the lug 51 is entirely on one side of the cam 36, and when the bar 14 is moved inward or into a position to actuate the platen roll and the cable 40 is drawn tight, the lug 51 is moved to the position shown in dotted lines in Fig. 5, which is completely on the opposite side of the cam 36.

The cable 40 preferably should be of a material which is a non-conductor of electricity. However, should it be desired to use a cable which is an electrical conductor, the lug 51 must either be of a non-conductive material or must be insulated from the cable.

It will be seen from this explanation and the drawings, that the lug 51 passes back and forth and rubs against the cam 36, in such manner that the cam is moved in a counter-clockwise direction, if the arm 31 has not previously fallen by gravity against the stop 37, when the lug and cable are operated or moved from left to right (Fig. 1), looking from the back of the carriage to the front, otherwise the lug 51 will wipe over the cam 36 without causing further movement thereof, and the cam 36 is moved in a clockwise direction when the lug and cable are returned to their normal positions. This movement will cause the swinging member 31 to partially pivot about its axis 30 and which in turn swings the arm 31 up and down; the switch being open on the down movement of the arm 31 and urged into a closed position when the arm 31 is brought upward. It is to be noted that the contact 34 can never bear against the paper while it is being turned by the platen roll.

The assembly of the swinging member 31 and contact 34 is free swinging. That is to say, it is moved in a clockwise or closed contact position by the lug 51, and is returned to an open position after the lug 51 has passed over the cam 36, by gravity. It is to be here understood that this return movement could be accomplished also by means of a spring.

The switch 25 is connected in any electric circuit desired. The circuit shown in Fig. 4, in schematic diagram is illustrative of a simple form that has been found to operate satisfactorily. The pivot 30 is connected to a wire 52, which in turn is connected to one side of a signal 53, such as a lamp, bell or buzzer. The other side of the signal is connected to a source of electric current, either A. C. or a battery 54, and the battery in turn is grounded at 55 to the carriage

of the typewriter. It will be seen from this description that when the contact points **23** and **34** are closed, the electric circuit will be closed and the signal **53** will be actuated.

The operation of my improved signal is as follows:

When the operator of a typewriter operates the platen roll advance lever, it strikes the member **14**, to urge the pawl **15**, into the ratchet **16**, to turn the platen roll. This moves the guide roller **42** toward the back of the carriage, which in turn draws the cable **40**, over the roller **44**, thus shortening the same and moves the lug **51** from its normal position, as shown in solid lines, to its tension position, as shown in dotted lines in Fig. 5.

The lug **51**, moving against the cam **36** in its initial movement from left to right, as shown in Fig. 1, causes the swinging arm **31** to first move in a counter-clockwise direction until it comes against the stop **37**, provided the arm **31** has not previously fallen there by gravity, and in this position the contact points **34** and **23** are as far apart as possible. This action insures that the movement of the paper **56**, in the typewriter, will not be interfered with by the contact **34**. The lug **51** will merely wipe over the cam **36** once it comes against the stop **37**. After the paper and platen roll have been advanced fully and are stationary, the operator releases the advance lever, which in turn permits the member **14** to return to its normal position. This movement permits the cable **40** to return to its normal position which returns the lug **51**, from the dotted line position to the solid line position, shown in Fig. 5.

This movement causes the lug **51** to rub against the cam **36** and urges the swinging member **31** in a clockwise direction which in turn causes the contact point **34** to be raised and urged against the contact **23**. If the paper **56** has not yet reached the end of the sheet, the contacts **34** and **23** will be prevented from closing and the electric circuit will not be closed, but if the end of the paper **56** has passed over the contact **23**, there will be nothing which will prevent the contacts from closing the electric circuit. As soon as the lug **51** moves beyond the cam **36**, the weight of the arm **31** and the screw contact **34** again will cause the arm to drop to its normal position. This automatically opens the contact points and consequently the electric circuit, thereby giving but a flash or momentary energizing of this electric circuit, energizing the bell, lamp, or buzzer.

Thus it will be seen that the improved switch, embodied in my invention, is fully automatic in its operation, inasmuch as the contact points are never urged into a closed position when the paper or platen roll are moving and likewise the contact points **23** and **34** being normally open, the release of the signal is accomplished simultaneously with the releasing of the operator's hand from the lever bar.

In the modification of my invention shown in Figs. 7, 8 and 9, there is also shown the conventional typewriter carriage designated generally as **10**, the platen roll **11** and the manual platen roll turning knob **12**. Associated with the platen roll **11**, is the customary roll advance mechanism **13**, and the bar **14**.

Supporting the ends of the platen roll, is a frame (not shown) similar to the members **21** and **21'**, of Figs. 1 and 2, to which is attached the rod **20**. To the rod **20** are attached a pair of rigid supports **60** and **61**, which are clamped thereto by screws **62** and **63**. Carried on the

ends of the supports **60** and **61** is a link bar **64**. On the end of the link bar **64**, adjacent the central portion of the platen roll, is an arm **65**. Insulating means **66** is provided between the arm **65** and the bar **64** which insulates the arm **65** from the typewriter carriage. As shown on the opposite end of the arm **65** is a screw contact **67** which is adapted to pass through the hole **22** in the paper pan **17**, and which contacts with the elongated grounding strip **23**.

On the end of the bar **64**, opposite the arm **65**, is a rigid operating link **68**, which may be connected thereto or formed integral therewith, as desired. The link **68** is connected to the bar **14**, as best shown in Fig. 8. This connection between the link **68** and the bar **14** may be made in various ways for various types of typewriters. However, in the form shown in this embodiment of my invention, it has been found that this link may be satisfactorily affixed to the bar **14**, by drilling a hole **69** in one end of the bar and clamping the end of the link **68** thereto by a nut **70**.

In the modification shown in Figs. 7, 8 and 9, the typewriter roll **11**, the carriage **10**, and other general parts of a typewriter not specifically mentioned above are identical to those shown and described in connection with Figs. 1 to 6. The elongated contact strip **23**, and its method of support are identical in both forms of my invention.

The operation of this form of my invention is quite similar to that shown in Fig. 1, the primary difference being in the method of operation of the switch and contacts.

The switch contact **67** is insulated from the carriage and is connected to a signal system by a wire **71**, extending to a signal, such as a lamp or buzzer **72**, which in turn is connected to a battery **73**, and the battery **73** is then grounded at **74** to the typewriter.

When the platen advance bar **14** is moved forward, the arm **68** will be carried in an arc therewith, thus bringing the contact **67** about the pivot of the bar **64**, in a counter-clockwise direction. This will move the contacts **67** and **23** further apart. When the bar **14** is released and returned to its normal operative position, the link **68** will be moved in a clockwise direction which in turn will let the arm **65** and contact **67** also move in a clockwise direction; but the bar **64** being clamped to the limitedly movable bar **14** will be prohibited from making a complete swing. If proper adjustment is made of the screw **67**, in the arm **65**, this motion will cause the arm **65** to "spring" in a clockwise direction, just sufficient momentarily to urge the contact **67** against the elongated contact **23**.

As in the preferred embodiment of my invention, if the typewriter paper **56** is between the contacts **23** and **67**, that is to say, if the end of the sheet of paper **56**, has not yet reached a predetermined point beyond the contacts **67** and **23**, they will be prevented from meeting or closing. However, when the end of the sheet of paper **56** passes beyond the contact strip **23**, the contacts **67** and **23** will close and the signal indicating that the end of the sheet of paper **56** has reached a certain point, will then be given to the operator of the machine.

In both forms of my invention, I have shown and illustrated, as a matter of convenience, the signal lamp **53**, as being carried directly upon the typewriter carriage. However, the signal lamp, bell or buzzer, whichever may be found desirable, can be mounted on the frame of the

typewriter, or, if desired, may be provided with an extension and located at any convenient place on the typist's desk and thus eliminate the weight of the signal device on the carriage.

If it is found desirable to locate the signal device 53 at some place other than on the carriage, a conventional pair of roller or sliding electrical contacts will be provided on the carriage and the typewriter frame and will make electrical contact between the pivot 30 and the signal 53, instead of the wire 52. These contacts will be connected to the pivot 30 and the signal device 53 by any suitable electrical connections.

Furthermore, both forms of my invention, as illustrated, may be altered and changed to be adapted to various forms and types of typewriter equipment, without departing from the spirit of my invention, and changes in wiring diagrams, types of cables, and material of the switches, contact points, and the like, may be made for different operating conditions also without departing from the spirit of my invention.

I claim:

1. The combination with a typewriter carriage, a platen roll on the carriage, and a platen roll advance mechanism associated with the carriage and platen roll, of an electric signal adapted to indicate that the end of a sheet of paper carried by the platen roll and carriage has reached a certain position, a switch having contacts carried upon said carriage, the contacts of said switch being in a normally open position, and means associated with the platen roll advance mechanism adapted to urge the contacts of said switch into a closed position following a completed advance of said platen roll, the contacts of said switch being prevented from closing until a sheet of paper has reached a certain position on the platen roll.

2. The combination with a typewriter carriage, a platen roll on the carriage, and platen roll advancing means, of an electric signal adapted to indicate the position of the bottom of a sheet of paper carried by the platen roll and carriage, a switch carried by said carriage adapted to operate said signal, said switch having a pivoted contact and an elongated contact extending substantially the length of said platen roll and disposed between the platen roll and a sheet of paper, the contacts of said switch being normally open and being adapted to be urged into a closed position after the platen roll has been advanced, said contacts being prevented from closing until the bottom of the sheet of paper has reached a certain position on the platen roll, and means associated with the platen roll advancing means for urging said pivoted contact to a closed position after each completed advance of the platen roll.

3. A signal for a typewriter having a carriage, a platen roll that is advanced step-by-step to move a sheet of paper in said typewriter, and means associated with the platen roll for advancing the same, comprising a normally open pivoted contact, a stationary contact coacting with the first-mentioned contact to operate a signal, said contacts being adapted to be separated by the paper when in certain positions on the platen roll, operating means associated with the pivoted contact and operated by the platen roll advancing means, said last-mentioned means being adapted to operate in timed relation after each advance of the platen roll, and a signal connected with said contacts.

4. A signal switch for a typewriter having a platen roll, and means to advance said roll, comprising a pair of normally open contacts, said contacts being adapted to be separated by the paper in said typewriter at certain positions of the paper on the platen roll, operating means associated with one of said contacts and operated by the platen roll advancing means to urge the contacts closed in timed relation after each completed advance of the platen roll, and a signal connected with said contacts.

5. A signal for a typewriter having a carriage, a platen roll on the carriage, and a platen roll advance mechanism associated with the carriage and platen roll, comprising a switch connected with an electrical signaling circuit adapted to be carried by said carriage, said switch having a pivoted contact in an open position under inoperative conditions, means adapted to insulate said contact from the carriage, a stop for said pivoted contact, a cam on said pivoted contact, a cable adapted to be operated by the platen roll advance mechanism in timed relation after each advance of said platen roll, means carried by said cable adapted to co-act with said cam to urge said pivoted contact into a closed position, and a stationary contact adapted to be associated with said platen roll, said stationary contact being separated from the pivoted contact by paper in said typewriter until the bottom of said paper reaches a predetermined position in relation to the platen roll.

6. A signal for a typewriter having a carriage, a platen roll on the carriage, and a platen roll advance mechanism associated with the carriage and platen roll, comprising a switch connected to an electric signaling circuit adapted to be carried by said carriage, said switch having a pivoted contact in an open position under inoperative conditions, a resilient hinge for said contact, a rigid bar affixed to said hinge and adapted to be rotatably supported on said carriage and means to insulate said contact from said bar, a rigid link carried by said bar adapted to be associated with the platen roll advance mechanism, said pivoted contact being adapted to be operated in timed relation after each advance of said platen roll, and a stationary contact adapted to be associated with said platen roll and separated from the pivoted contact by paper in said typewriter until the bottom of said paper reaches a predetermined position in relation to the platen roll.

7. A signal device for a typewriter having a platen roll and means to advance said roll comprising spaced electrical contacts adapted to receive a sheet of paper therebetween in said typewriter, means adapted to mount said contacts on the typewriter for relative movement to a non-engaging position when the paper is interposed therebetween and to an engaging position in the absence of the paper, and means operated by the platen roll advancing means following each completed movement of said platen roll for causing relative movement of the contacts to an engaging position.

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