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A. SINILA
SOLENOID-OPERATED TYPEWRITER AUTOMATIC DRIVE
AND MOUNTING THEREFOR

3,340,985

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2 Sheets-Sheet 1

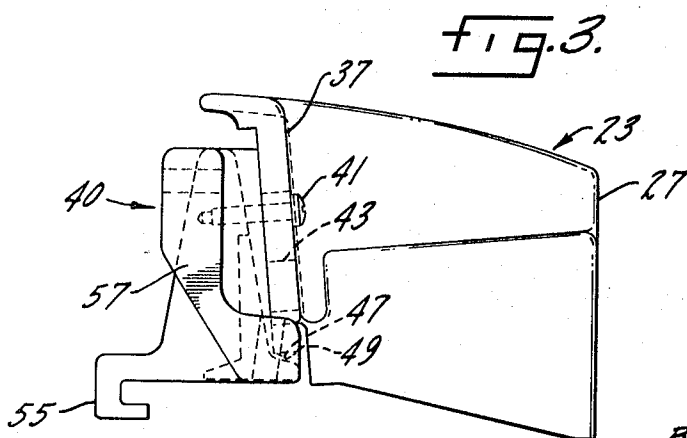
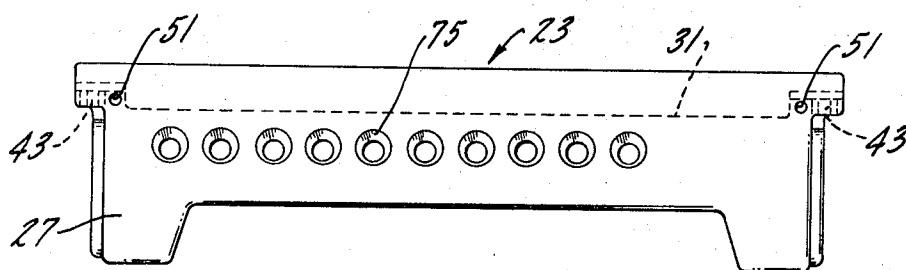
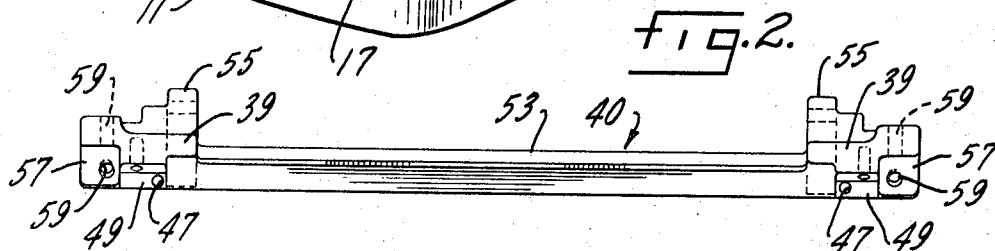
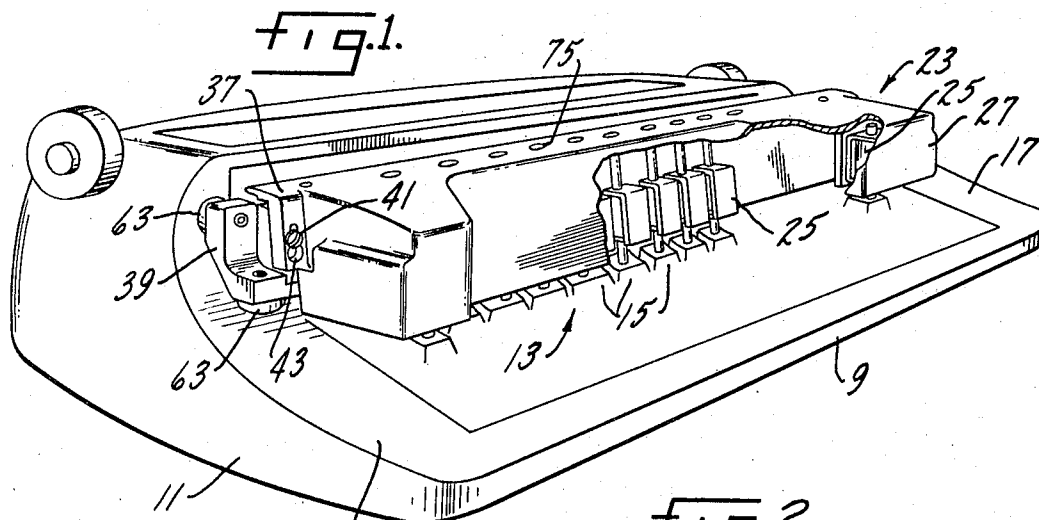


fig. 4.

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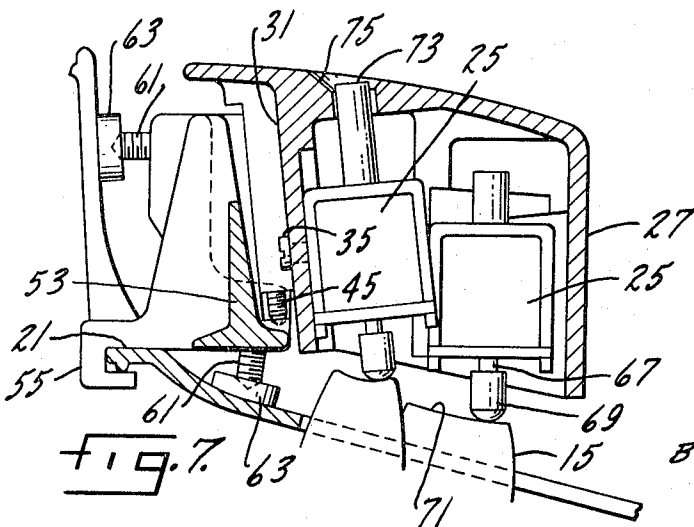
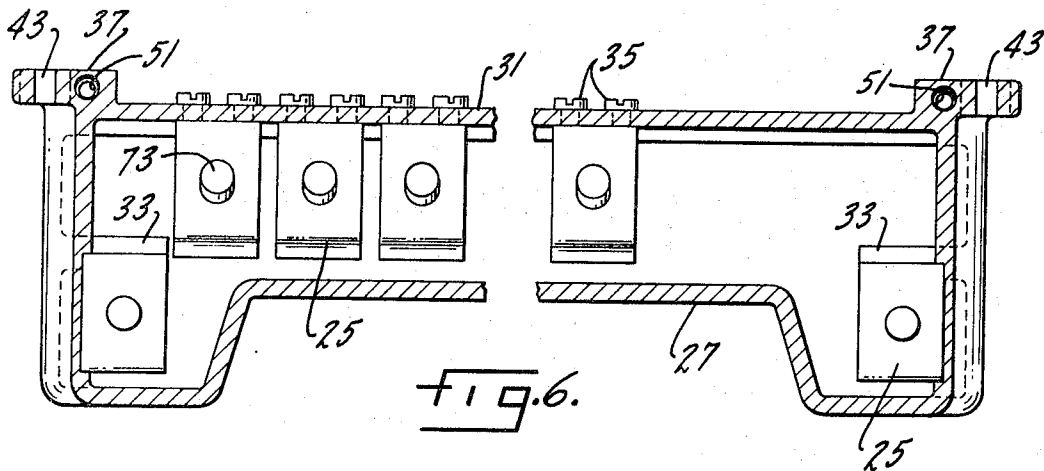
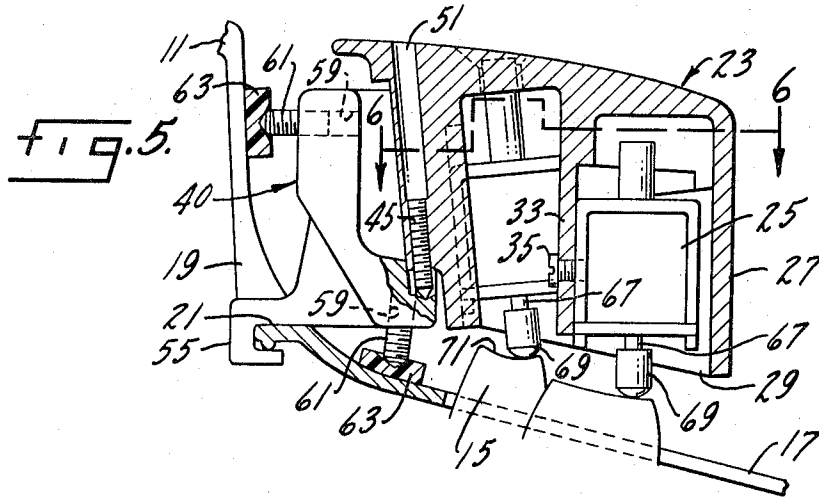
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SOLENOID - OPERATED TYPEWRITER AUTOMATIC DRIVE AND MOUNTING THEREFOR

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4 Claims. (Cl. 197—19)

ABSTRACT OF THE DISCLOSURE

An automatic drive having an actuator support containing solenoids to remotely actuate typewriter keys and mounted on a support beam by fasteners extending from the support beam which engage slots formed in the actuator support, thereby enabling quick installation and removal of the actuator support. Adjustable threaded members extend from the actuator support and engage the support beam to enable proper vertical adjustment of the actuators relative to the keys. The support beam is attached to the typewriter housing by U-shaped members which hook onto the typewriter housing and by oppositely acting screw adjustment members which bear on the typewriter housing.

This invention relates to an automatic drive for a typewriter and more specifically to a solenoid operated automatic drive for operating the numeral, tab and return keys on a typewriter for use with automatic numerical readout instruments.

An object of this invention is an automatic drive for a typewriter which can be easily mounted on commercially available typewriters.

Another object is an automatic drive that can be connected to a typewriter without altering the housing of the typewriter.

Another object is an automatic drive that can be mounted above the keyboard of a typewriter.

Another object is an automatic drive that operates the typewriter by depressing the keys.

Another object is an automatic drive having an actuator support that can be adjusted vertically relative to the keyboard of the typewriter.

Another object is an automatic drive in which the actuator housing can be removed from the typewriter independently of its support member.

Other objects may be found in the following specification, claims and drawings.

The invention is illustrated more or less diagrammatically in the following drawings wherein:

FIGURE 1 is a perspective view of an embodiment of the invention mounted on a conventional typewriter with a portion of the actuator housing cut away;

FIGURE 2 is a top plan view of the actuator housing support member;

FIGURE 3 is a top plan view of the actuator housing;

FIGURE 4 is an end view of the actuator housing and housing support bracket;

FIGURE 5 is a vertical cross-sectional view taken through the actuator housing adjacent one of the support brackets;

FIGURE 6 is a cross-sectional view taken along line 6—6 of FIGURE 5; and

FIGURE 7 is a vertical cross-sectional view taken through the actuator housing and housing support member.

Referring now to the drawings, and particularly to FIGURE 1, a typewriter 9 is shown having a housing 11, a keyboard 13 and keys 15 arranged in rows on the keyboard. Surrounding the keyboard on the sides thereof

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are arcuate shaped shoulders 17 formed as part of the housing. As can be most clearly seen in FIGURE 5, an opening 19 is formed in the housing above the keyboard with the lower portion of this opening defined by a flat ledge 21.

An automatic drive 23 of this invention is shown positioned on the typewriter 9 above the keyboard 13. This automatic drive includes a number of actuators 25, which in this case are solenoids, attached to an actuator support housing 27 having an open bottom 29. The actuator support housing 27 is preferably formed as a metal casting. The solenoids are positioned inside the housing; being attached to the forward vertical wall 31 of the housing and to inwardly extending partitions 33 which are formed as part of the housing by means of threaded fasteners 35. Also cast as part of the housing are vertical flanges 37 which are located at the ends of the vertical wall 31. The vertical flanges are adapted to abut and be fastened to brackets 39 formed integrally as part of a support member 40 by threaded fasteners 41 which fit through key hole openings 43 in the vertical flanges and fasten into the support brackets. The housing is also supported on the support brackets by set screws 45 which engage shallow holes 47 formed in ledges 49 on the brackets of the support member. The set screws are located in partially threaded vertically extending apertures 51 formed in the vertical flanges 37 of the actuator support housing 27. The set screws can be used to vertically adjust the housing relative to the support member 40 and to the typewriter keyboard.

The support member 40 also includes an integral elongated beam 53 of inverted T-shaped cross-section which connects the brackets and spans the keyboard 13 to position the support brackets over the housing shoulders 17. Located inwardly of the brackets and formed integral therewith are U-shaped hooks 55 which are adapted to rest on and hook over the ledge 21 of the housing 11 to cantileverly support the brackets thereon. The outer integral portions 57 of the brackets are generally L-shaped and stand upright relative to the typewriter housing. Threaded apertures 59 extend through the arms of the L-shaped outer bracket portions to receive threaded screws 61 which engage nylon pressure pads 63 positioned in contact with the shoulder surfaces 17 of the typewriter housing. Tightening of the screws 61 against the pressure pads 63 will force the support brackets outwardly against the hooks 55 to clamp the support member 40 rigidly to the typewriter housing.

The solenoids 25 have plungers 67 with tips 69 adapted to engage the concave surfaces 71 of the keys 15. The numeral key plungers 67 are equipped with pushbuttons 73 which extend through openings 75 in the actuator support housing 27 to permit manual actuation of these keys.

The use, operation and function of this invention are as follows:

The solenoid operated automatic drive of this invention is particularly applicable to be mounted on a typewriter to operate the numeral, tab and return keys to record the output of an electronic device such as a multi-channel analyzer. The solenoids may be wired to the analyzer in any conventional manner so that the typewriter key corresponding to the number indicated by the analyzer will be operated by its solenoid. For clarity of illustration, the wiring is not shown. The embodiment of the invention is particularly adapted to be mounted on a typewriter without requiring modification of the housing of the typewriter. This is accomplished by constructing the automatic drive so it can be mounted above the keyboard of the typewriter in order to permit the solenoids to operate the keys of the typewriter in the same manner as an operator would. The positioning of

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the solenoids in this manner is accomplished by supporting the automatic drive on the housing of the typewriter by means of a separate support member which hooks to the housing of the typewriter and is frictionally held in engagement therewith.

To mount the automatic drive on a conventional typewriter, the hooks 55 of the brackets 39, which are part of a separate support member 40, are engaged with the ledge 21 of the typewriter housing 11 and the threaded screws 61 which extend through the L-shaped outer portions 57 of the support brackets are rotated to force the nylon pressure plates 63 against the shoulders 17 of the typewriter housing and the support member brackets away from the typewriter housing. With the hooks engaging the ledge 21 and the threaded screws tightened against the pressure plates and support brackets, the support member 40 will be held in place against the typewriter housing and will support beam 53 which bridges the typewriter keyboard. The actuator support housing 27 can then be connected to the support member by means of the threaded fasteners 41 which are screwed into the brackets. The height of the housing relative to the support member can be adjusted by means of the set screws 45 and the adjustment of the threaded fasteners 41 in the key hole openings 43. With the actuator support housing mounted above the keyboard so that the solenoids are aligned with the row of numeral keys and with the tab and return keys, the housing can be adjusted vertically so that the solenoid plungers contact the typewriter keys when the keys are in their normal elevated positions.

Actuation of a solenoid will force its plunger tip 69 against the concave surface 71 of the key to depress the key and actuate the striker (not shown). Release of the solenoid will allow the plunger to move upwardly so that the key will return to its inactive elevated position. The numeral keys may be manually operated by means of the pushbuttons 73 which extend through the openings 75 of the actuator support housing 27. Also, the actuator housing can be removed from the typewriter independently of the support member 40 which may remain in place on the typewriter without interfering with the manual operation thereof.

Whereas the preferred form of the invention has been shown and described herein, it should be realized that there are many modifications, substitutions and alterations thereto within the scope of the following claims.

I claim:

1. In a device having at least one solenoid positioned to remotely actuate at least one key on a typewriter keyboard, improved means for attaching said device to a typewriter housing comprising:
an elongated beam having a U-shaped bracket and an

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L-shaped bracket adjacent each end of said beam, said L-shaped brackets having a first vertically extending leg and a second leg extending generally horizontally in a direction towards said keyboard,

said U-shaped brackets extending generally horizontally in a direction opposed to said second legs and adapted to hook onto said typewriter housing so that movement of said beam is restricted vertically and horizontally in a direction towards said keyboard,

an adjustable threaded member extending from each leg of said L-shaped brackets and adapted to engage said typewriter housing and urge said support beam and U-shaped hooks generally upwardly and horizontally towards said keyboard, thereby rigidly mounting said beam to said typewriter housing, a housing adapted to receive and support each said solenoid, and

means formed in said beam and said solenoid housing to removably support said solenoid housing on said beam in a position cantilevered from said beam and extending over said keyboard.

2. The structure of claim 1 further characterized in that said solenoid housing supporting means comprise a fastener adjacent each end of said beam adapted to engage an aperture formed in each corresponding end of said solenoid housing.

3. The structure of claim 1 further characterized in that threaded adjustment members extend from said solenoid housing and engage said beam, thereby enabling vertical adjustment of said solenoids with respect to said typewriter keys.

4. The device of claim 1 further characterized in that said solenoids are adapted to be manually actuated.

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