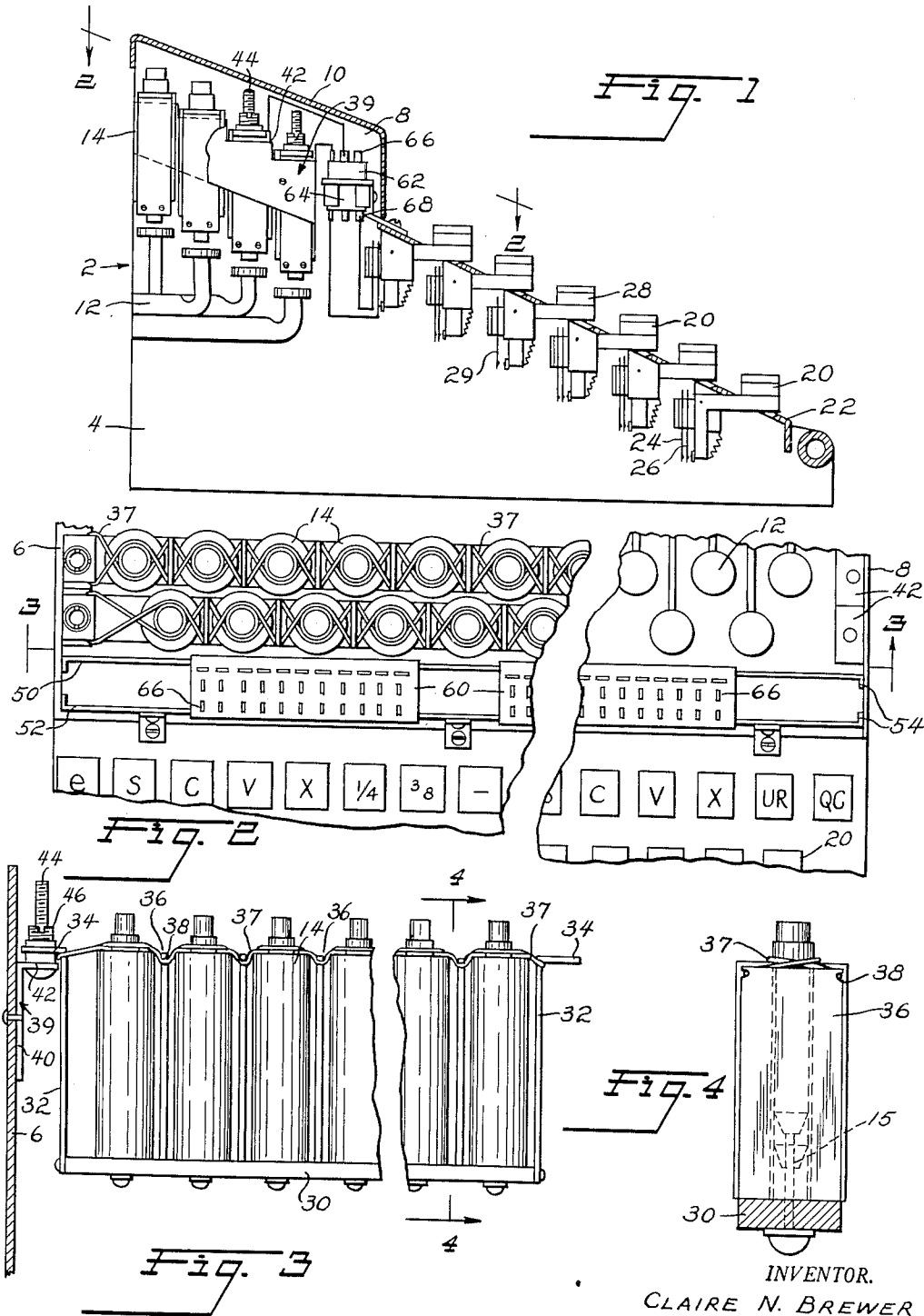


March 6, 1956

C. N. BREWER

2,737,616

UNITARY AND SECTIONALIZED STRUCTURE OF AUXILIARY
OPERATING MECHANISM FOR TYPESETTING, TYPECASTING
AND SIMILAR MACHINES
Filed Dec. 11, 1953



INVENTOR.

CLAIRE N. BREWER

BY

Scrivener & Parker

ATTORNEYS

1

2,737,616

UNITARY AND SECTIONALIZED STRUCTURE OF AUXILIARY OPERATING MECHANISM FOR TYPESETTING, TYPECASTING AND SIMILAR MACHINES

Claire N. Brewer, Huntington, W. Va., assignor to Unitypo, Inc., Indianapolis, Ind., a corporation of New York

Application December 11, 1953, Serial No. 397,736

3 Claims. (Cl. 317—158)

The invention described herein is an improvement on that described in my United States Letters Patent No. 2,679,902 for Auxiliary Keyboard and Operating Mechanism for Typesetting, Typecasting, Message Transmission, Tape Perforating and Similar Machines.

The invention described and claimed in my co-pending application relates to a machine or device for operating the keys of the keyboard of a machine, such as the Teletypesetter which is now available commercially, which produces a tape having perforations therein each of which represents a letter, numeral, or other character, and which tape, in turn, is used to operate a machine which sets or casts type or performs both operations. By the invention described and claimed in my co-pending application a solenoid is provided for each key of the tape-perforating machine and is so arranged with respect to its associated key that upon energization of any solenoid the plunger thereof is moved downwardly into engagement with the key, thereby operating the same to produce the characteristic tape perforation. The invention of my co-pending application also provides a keyboard having keys positioned and arranged substantially as in a standard Linotype machine keyboard, together with switch means operated by depression of any one of these keys for energizing the solenoid which operates the corresponding key of the tape-perforating machine. Reference is made to my co-pending application for a more complete description of the general structure and mode of operation of the device to which the present invention relates.

It has been the principal object of this invention to provide a structure including the parts described above which may be easily and quickly assembled or disassembled and which is so constructed and arranged that either one, or a group, or all, of the solenoids which operate the keys of the tape-perforating machine may be selectively removed, whereby repair or replacement of all, or a part, or any one of these solenoids may be easily and quickly effected. In this connection, and as part of this object, it has been a further object of this invention to provide a unitary, easily installed and easily replaceable means associated with the solenoid assembly to which the wire connections from the solenoids and from the key-operated switch means may be brought, thereby facilitating the wiring of the device and the assembly or removal of all or a part of the wiring connections.

Other objects and features of novelty of the invention will be made apparent by the following description and the annexed drawings in which:

Fig. 1 is a sectional view taken vertically through a device such as that to which this invention particularly relates, and showing the various assemblies and devices according to this invention;

Fig. 2 is a top plan view of the parts and assemblies shown in Fig. 1, taken on line 2—2 of that figure;

Fig. 3 is a front view, partly broken away, of a unitary

2

straight-line assembly of solenoids according to this invention, taken on line 3—3 of Fig. 2, and

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3.

In Fig. 1 of the drawings there is shown the keyboard 2 of a conventional tape-perforating machine 4, such as the Teletypesetter. The keyboard is positioned at the front of the machine and in accordance with the invention of my co-pending application I have provided an enclosing and supporting structure having side walls 6, 8 and a cover 10, which is shaped to provide a relatively high rear chamber part which fits over the keyboard of the tape-perforating machine and is of such size that its side walls closely fit the sides of the keyboard of the tape-perforating machine while the cover is positioned sufficiently above the keys 12 of the tape-perforating machine keyboard to permit a plurality of vertically arranged solenoids 14 to be positioned within the structure beneath the cover, with the lower end of each one sufficiently above the upper surface of one of the keys of the tape-perforating machine keyboard to permit the downward movement of the plunger of the solenoid to operate the key below it upon energization of the solenoid. The plunger 15 of each solenoid is normally held in a raised position out of engagement with the key below it by a spring (not shown) and upon energization of the solenoid winding is moved downwardly against the force of the spring into engagement with the key of the tape-perforating machine which is below it to depress such key and cause a corresponding and pre-determined perforation of the tape. A solenoid is provided for each key of the tape perforating machine keyboard.

The keyboard 2 has all of the character keys of the conventional typewriter keyboard, arranged in the same positions, and also has additional character keys which are required for printing but are not required for type-writing. In addition, this keyboard has a shift key and an unshift key which, when operated, produce characteristic tape perforations which cause the typesetting or casting machine operated and controlled by the tape to set upper case or lower case characters corresponding to subsequent tape perforations, depending on which of the shift and unshift keys has been operated. The keyboard 2 also has keys which, when operated, produce the same tape perforation regardless of whether the shift or unshift key was last operated. The keyboard is also provided with other keys and bars which are fully described in my co-pending application.

There are also illustrated in Fig. 1 a plurality of keys 20 of a keyboard 22 which is provided by the invention of my co-pending application, which keys are arranged substantially as in a standard Linotype machine keyboard. Each of the upper and lower case character keys 20 of the keyboard 22 has associated with it two contacts 24, 26 which are successively engaged upon operation of the key to successively energize the shift or unshift key solenoid and then the corresponding character key solenoid of the tape-perforating machine. Others of the keys, such as key 28, have only one contact 29 associated therewith and operation of one of these keys causes direct operation of the operating solenoid for the corresponding key of the tape-perforating machine keyboard, these latter keys being known as the "no-shift" keys.

The keys 12 of the keyboard 2 of the tape-perforating machine are arranged in rows extending from side to side of the keyboard, as in the usual typewriter keyboard, and according to the present invention the solenoids 14 which operate the keys of this keyboard are arranged and releasably supported in a plurality of rows corresponding to the rows of keys of the keyboard. All of the solenoids which operate the keys of each row form a unitary,

3

straight-line row assembly, one of which is shown in Fig. 3 with parts broken away. Each of these unitary assemblies comprises a base bar 30 having an upwardly extending arm 32 at each end thereof having at its upper end a flange 34 extending outwardly at right angles therefrom and having a hole therein. The solenoids are placed adjacent each other along the length of bar 30 with their centers spaced apart by distances equal to the spacing of the centers of the keys of the underlying row of keys, whereby each solenoid plunger will contact the center of the key below it. Walls 36 are provided between adjacent solenoids and are attached either integrally or by suitable attaching means to the base bar and extend upwardly at right angles therefrom. The base bar 30 is formed of magnetizable metal, such as soft iron, and is of substantial thickness, thereby forming part of the magnetic circuit set up by energization of the winding of each solenoid. The winding of each solenoid is formed as a unit which may be removed from its plunger by sliding it vertically upwardly from the plunger. The windings are normally held from such removal by means of cords 37 which are trained about the upper ends of the plungers above and in contact with the upper ends of the windings and which extend through slots 38 formed in the upper parts of the side edges of the spacing members 36 adjacent the upper ends thereof. It will be seen that the solenoids operating each row of keys are thus formed into a straight-line, unitary assembly which may be assembled and handled as a unit and from which each individual solenoid may be easily removed by loosening the cords and removing first the winding and then the plunger assembly of the solenoid.

As the keyboard of the tape-perforating machine has a plurality of rows of keys extending from side to side thereof, there are provided a corresponding number of unitary, straightline row assemblies of solenoids, each of which is assembled and constructed in the manner described hereinbefore. The rows of keys of the keyboard of the tape-perforating machine are arranged in upwardly stepped relation from front to back of the keyboard, as shown in Fig. 1 and as in the usual typewriter keyboard, and means are provided by the present invention for supporting the unitary row assemblies of solenoids in similar relation above the keys in order that the solenoids of each unitary row assembly will be operatively positioned above the keys of one of the rows of keys of the keyboard. These supporting means for the solenoid assemblies comprise two brackets 39, which are respectively attached to the two side walls 6, 8 of the enclosing and supporting structure. Each of these brackets comprises a vertical side wall 40 from which a plurality of flanges 42 extend inwardly in upwardly stepped relation from front to back of the keyboard. A screw 44 extends vertically upwardly from each flange and is adapted to be received in the hole in one of the outwardly extending flanges 34 at the upper end of one of the end members 32 of one of the unitary row assemblies of solenoids. The vertical side walls 40 of the brackets are attached, respectively, to the side walls 6, 8 in horizontal alignment whereby the stepped flanges of the two brackets are in horizontal alignment, thus permitting a unitary row assembly of solenoids to be supported on each aligned pair of flanges of the brackets. Suitable means such as the nuts and tightening nuts 46, which co-operate with the screws 44, may be provided on each flange of each bracket to securely attach each unitary row assembly of solenoids to a pair of bracket flanges. It will thus be seen that each unitary row assembly of solenoids may be separately removed from the supporting brackets, as a sub-unit, by unscrewing it therefrom, and that all of the unitary row assemblies of solenoids may be simultaneously removed from the enclosing structure, as a principal assembly, by removing the two brackets from the side walls.

The present invention also includes means for provid-

4

ing common, easily accessible means for connecting the leads from the contact means 24, 26, 29, which are operated by the keys 20, 28 of the keyboard 22, to the leads of the solenoids. Such means comprise two elongated metallic strips 50, 52 each of which has both its ends intumed, as shown at 54, to form a substantially rectangular frame which extends between the side walls 6, 8 and is supported thereon by screws or other suitable means. The elongated side members of this frame support one or more contact board units 60, each of which is formed of an upper part 62 and a lower part 64, which are releasably connected by plugs so that one may be removed from the other and from the supporting frame which supports them both. The upper and lower contact board members have upwardly and downwardly extending terminal members 66 and 68, respectively, and each lead from a solenoid is connected to one of the upwardly extending terminal members 66 of the upper contact board, while each lead from a switch of the keyboard 22 is connected to the corresponding downwardly extending terminal member 68 of the lower contact board. As each of the terminal members of the upper contact board is electrically connected to one of the terminal members of the lower contact board, each switch is connected to the proper solenoid by connection of the two contact boards.

It is believed that the use and operation of the sectionalized, unitary structure provided by this invention will be apparent from the foregoing description. As stated, each of the unitary, straight-line row assemblies of solenoids constitutes a sub-unit which may be positioned above one of the rows of keys of the tape-perforating machine and may be attached to the structure which encloses the keyboard of that machine by connection to a pair of flanges of the two unitary brackets which are releasably attached to the side walls of the enclosing structure. All of these unitary row assemblies are releasably attached to these brackets and may be removed therefrom, one by one, as sub-units without disturbing the other row assemblies. If desired, all of the row assemblies may be handled, installed or removed as a unitary assembly after attachment thereof to the two brackets. The contact boards to which are attached the leads from the solenoids and from the contact members of the auxiliary keyboard are releasably supported as a unitary assembly on the structure which encloses the keyboard of the tape-perforating machine, and may be handled, installed or removed as a unit. Each contact board is itself formed of two parts and each of these parts has a set of terminals, which are electrically connected to those of the other part when the parts are themselves connected. The terminals of one part have connected thereto the leads from the solenoids while the terminals of the other part have connected thereto the leads from the contact members which are engaged by the keys of the auxiliary keyboard. Thus, the entire contact board may be handled, installed or removed as a unit, or the two parts thereof may be separately removed from each other. Also, each row assembly of solenoids, or the entire solenoid assembly, may be handled, removed or installed with the associated part of the contact board assembly and the leads connecting the solenoids to the terminals thereof.

While I have described and illustrated in this application one embodiment of my invention it will be apparent to those skilled in the art that other embodiments, as well as modifications of that disclosed, may be made and practiced without departing in any way from the spirit or scope of the invention, for the limits of which reference must be made to the appended claims.

What is claimed is:

1. A unitary assembly of solenoids comprising an elongated bar of substantial thickness, a plurality of solenoids supported on said bar with their axes at right angles thereto and with the lower end of the winding of each

5

solenoid resting on said bar whereby the bar forms part of the magnetic circuit for the flux generated upon energization of the winding, spacing members between adjacent solenoids, means releasably attaching each solenoid to the spacing members adjacent thereto, and members extending from the ends of said bar in the same direction as said spacing members and providing means for attaching said unitary assembly to a support.

2. A unitary assembly of solenoids comprising an elongated bar of substantial thickness, a plurality of solenoids supported on said bar with their axes at right angles thereto and with the lower end of the winding of each solenoid resting on said bar whereby the bar forms part of the magnetic circuit for the flux generated upon energization of the winding, spacing members between adjacent solenoids having apertures therein adjacent the upper ends thereof, cords extending through said apertures and in opposite directions about the upper ends of said solenoids to releasably attach each solenoid to the spacing members adjacent thereto, and members extending from the ends of said bar in the same direction as said spacing members and providing means for attaching said unitary assembly to a support.

6

3. A unitary, separable assembly of solenoids adapted for attachment to the spaced parallel walls of a housing, comprising two spaced parallel plates having flanges formed on their upper edges in stepped relation, the flanges of one plate being horizontally aligned with those of the other plate, a plurality of unitary row assemblies of solenoids supported by said plates, each of said assemblies comprising an elongated bar of substantial thickness, a plurality of solenoids removably supported on said bar with their axes at right angles thereto, and attaching members extending from the ends of said bar in the same direction as the solenoids and having flanges at their outer ends for releasable attachment to an aligned pair of flanges of said plates.

References Cited in the file of this patent

UNITED STATES PATENTS

1,701,436	Baker	Feb. 5, 1929
1,753,991	Langford	Apr. 8, 1930
1,811,387	Gilmore et al.	June 23, 1931
2,014,432	Gerhold	Sept. 17, 1935