

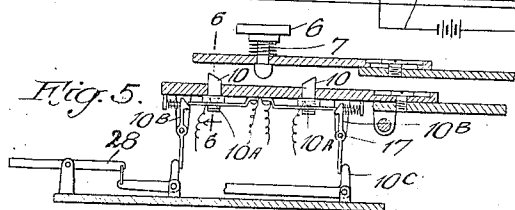
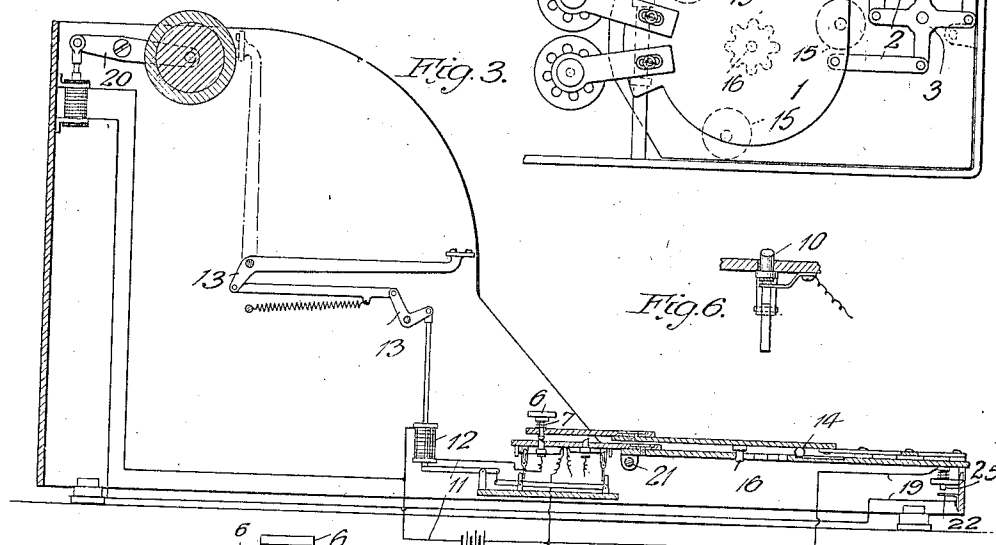
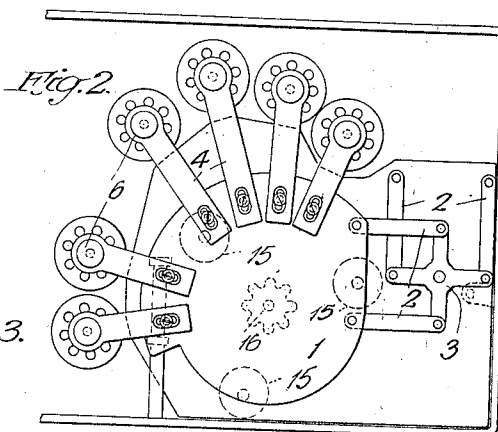
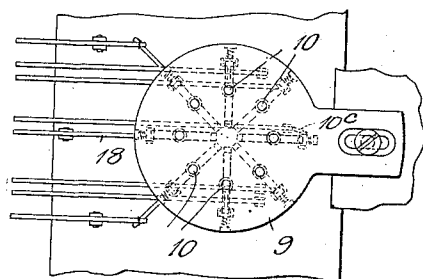
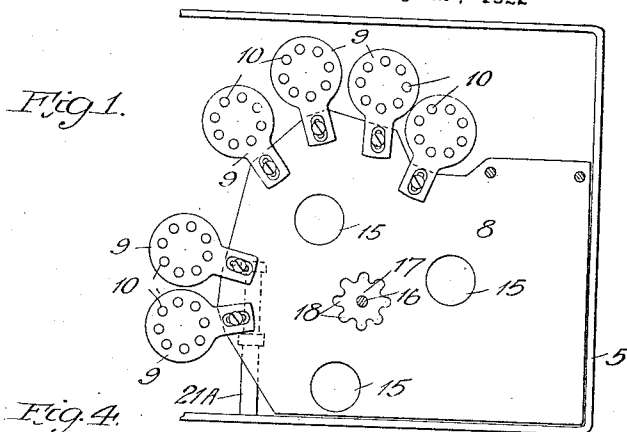
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J. B. DAVIES

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TYPEWRITER AND LIKE KEYBOARD MECHANISM

Filed July 22, 1922



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TYPEWRITER AND LIKE KEYBOARD MECHANISM.

Application filed July 22, 1922. Serial No. 576,658.

To all whom it may concern:

Be it known that JOSEPH BARTLETT DAVIES, a subject of the King of Great Britain, residing at Melbourne, Victoria, Australia, has invented certain new and useful Improvements in Typewriters and like Keyboard Mechanism, of which the following is a specification.

This invention relates to typewriters and like mechanism operated from a keyboard. As the invention is particularly applicable to typewriters it will be described in relation thereto but it must be understood that it is not so limited in its application.

The object of this invention is the construction of a keyboard and adjuncts to a typewriter, or other similar machine, of such a nature that the movements of the hand required for working the same shall be the shortest and least laborious possible of attainment, and so constructed that it can be operated by a single hand, controlled purely by touch without movement of the fingers from the keys upon which they rest.

The outstanding feature of the invention is the combination of a vertical movement of any one finger of one hand simultaneously with a horizontal movement of the whole hand as described hereafter. Since the whole hand or wrist can be readily guided so as to move in 8 different directions (namely—forward, backward, right, left, and positions between these), the combination of 6 keys (allowing 2 for the thumb) with these movements will 48 points of possible contact, each one of which can be made to operate a character or used for other purposes and no one of these hand or finger movements need exceed $\frac{1}{8}$ of an inch in length.

I attain the objects of this invention by the mechanism illustrated somewhat diagrammatically in the accompanying drawings in which—

Fig. 1 is a plan of a part of the machine frame the base plate mounted thereon and its pins with the hand rest plate removed.

Fig. 2 is a plan of the hand rest plate in position, upon the base plate.

Fig. 3 is a part sectional view of the frame plates and type-operating mechanism, showing a single circuit and lever, and one form of change key circuit.

Fig. 4 is an enlarged plan view of an adjustable pin-carrying arm and the switches and trip lever arms associated therewith.

Fig. 5 is a detail sectional view of the pre-

ferred form of contact surfaces on the key shaft and pins, and shows the detent for the switch and its trip-lever.

Fig. 6 is a detail sectional view of a pin and associated switch element on the line 6—6 of Fig. 5.

A slidable hand rest plate 1 is prevented from rotation by a parallel motion device 2, 3. Adjustably attached to the hand rest plate are six arms 4 on each of which a vertically slidable key 6 is mounted and each key is provided with a return spring 7. One key is operated by each finger of the hand used and two keys by the thumb. Below the hand rest plate a bed plate 8 is provided having six adjustable arms 9 each carrying eight pins 10. The base of each key shaft is bevelled, semispherical, or of truncated conical shape, to engage the bevelled, or similarly shaped, top of a pin on simultaneous depression of the key and movement of the hand rest plate. The engagement of the base of a key shaft with a pin closes a spring switch 10^a and completes a circuit 11 through a solenoid 12, associated with each lever system 13, and causes the corresponding character to be marked on the paper.

The hand rest plate is mounted on three, or other number, of ball bearings 14, mounted in open races 15 on the bed plate, and carries on its under side in a more or less central position a depending guide peg 16 which is accommodated in a central slot 17 and eight radial guide slots 18 on the plate. The engagement of the peg with one of the radial slots brings the keys 6 above the corresponding pins 10 so that depression of the keys in this position would produce six different markings according to which key is struck. As there are eight circuits for each key, corresponding to the positioning of the peg in any of the eight radial slots, this system provides for forty-eight different markings.

In order to prevent the spring switch from opening before the core 12^a has been drawn into the solenoid 12 sufficiently to ensure the contact of the type character with the paper, a spring-pressed, pivoted detent 10^b is provided. This detent is pivoted at 17 and engages the spring element of the switch when the latter is depressed and holds the switch in closed position until the end of the solenoid core strikes a bell-crank lever 10^c and releases the detent. These

spring switches are radially distributed, being mounted on the arm 9 adjacent the circularly disposed pins therein; and their respective detents are accordingly angularly disposed relatively to each other, as shown in Figs. 4 and 5. Their release is accordingly effected either by direct trip of the bell-crank levers 10^c actuating them, or by indirect trip through the medium of the pivoted linkage 28, according to the operative position of the detent.

The change key may be operated by the left hand to complete a circuit 19 and actuate a lever system 20 by which the relative position of the roller and strikers is altered in any of the usual ways, or the circuit may be closed if preferred, by pivotally mounting the bed plate on shaft 21, which is journaled in the frame 5 so that increased pressure of the hand on the hand rest plate will slightly depress the other side of the plates and cause a depending contact stud 25 on the bed plate to engage and close a spring switch 22 positioned beneath it.

The longitudinal and rotary movements of the roller, on the completion of a line, and other special movements or adjustments required in the operation of the machine may be effected in any usual manner, not necessary to be shown, preferably electrically in a similar manner to the movements of the strikers. It will also be obvious that such operation may be either from the main keyboard or by separate keys actuated by the left hand or otherwise. As the main keyboard provides 48 different circuits there are about 6 circuits available for the actuation of special movements, such as those customarily performed by shift-keys, shift-lock keys, back spacers and the like movements well understood as commonly existing in standard machines and not here illustrated.

While it is preferred to keep one hand more or less free, it is obvious that by duplicating the keyboard mechanism and levers and using both hands, the number of positions in each group could be reduced or the use of a change key could be obviated.

I claim:

1. In typewriter and like keyboard mechanism, a keyboard consisting of a hand rest slidably mounted and adapted to move in a multiplicity of directions in the plane thereof; a plurality of finger-keys mounted upon said rest; a fixed plate below said rest and carrying a plurality of movable contacts arranged in groups, individual groups being arranged to register with particular keys, individual contacts of any group being adapted to be moved by the engagement therewith of the key allocated to its group.

2. In typewriter or the like key-board mechanism, the combination of a hand-rest,

means for slidably supporting same, said means being adapted to permit free movement of said rest in a plurality of directions and including a pivotally mounted base-plate; a series of keys carried by said rest; a series of pins carried by said plate, arranged below and in correspondence with said keys and adapted to be severally actuated by depression of its respective key, and means, operable by said pins, adapted to actuate type-characters.

3. In typewriter or the like key-board mechanism, the combination of a tabular hand-rest, means for slidably supporting same, said means being adapted to permit free movement of said rest in a plurality of directions in the plane of the hand-rest and including a base-plate; a series of keys carried by said rest, a series of groups of pins carried by said plate, arranged below and in correspondence with said keys and adapted to be severally actuated by depression of the key related to the associated group, and means, operable by said pins, adapted to actuate type-characters.

4. In an electrically operable typewriter mechanism, the combination of a slidable hand-rest, means for freely supporting same while permitting motion thereof in a multiplicity of directions, said means including a base-plate, a series of vertically movable contact keys carried by said hand-rest; a corresponding series of groups of pins carried by said plate; each key being adapted to contact mechanically when depressed with any pin of its corresponding group and depress same, and each pin being adapted to close an electrical circuit when depressed.

5. In an electrically operable typewriter mechanism, the combination of a hand-rest, means freely supporting same: a series of finger keys carried by said rest; a series of movable contacts, a plurality of said contacts being adapted to register with each of said keys; an electric circuit associated with each contact, said circuits each including a normally open spring-switch adapted to be closed by its contact and to close said circuit, a solenoid adapted to be energized by the closure of said circuit; a pivoted detent associated with said switch, and means adapted to actuate said detent to engage an element of said switch and keep said circuit closed for a predetermined interval, said means comprising a spring and a bell-crank lever, one arm of said lever being positioned in the path of the core of said solenoid, the said interval being limited by the release of the detent when the arm of said lever is depressed by said core.

6. In typewriter and like key-board mechanism, a key-board consisting of an upper member comprising a hand-rest plate and finger-keys supported thereby and a lower member comprising a base plate and

movable contacts adapted to be actuated by said keys, the said upper member being movable relatively to said lower member in a multiplicity of directions, and means for
 5 controlling the direction of movement comprising a guide peg depending from said upper member and engaging a central aperture in said lower member, said aperture having a plurality of slots radiating there-
 10 from.

7. In typewriter and the like keyboard mechanism, the combination of a hand-rest plate mounted upon ball-bearings in open
 15 races on a bed plate; said bed plate having a parallel motion device mounted thereon, the said device being attached to said hand-rest plate, and adapted to limit the travel thereof.

8. In typewriter and the like key-board
 20 mechanism, the combination of a bed plate, a hand-rest plate slidably mounted thereon, a parallel motion device mounted on said bed plate and connected to said hand-rest plate and adapted to prevent rotation thereof; a
 25 guided member on one plate and a guiding means on the other, said means permitting motion of the rest plate in a multiplicity of radial directions from a central point on the bed plate.

30 9. In a typewriter and the like key-board mechanism, the combination of a horizontally movable hand-rest, and a series of depressible keys carried thereby; a fixed plate therebelow and an equal number of series of
 35 groups of vertically movable pins carried

thereby, a plurality of pins being comprised in each group; means controlling the range of motion of said hand-rest, the said means comprising a parallel motion device common to
 40 said plates; means controlling the direction of motion of said hand-rest, the said means comprising a member depending from said hand-rest plate, a central aperture in said fixed plate engaged thereby, and a series of
 45 radial slots extending from said aperture, the number of said slots being equal to the number of said contacts comprising a group.

10. In a typewriter key-board mechanism, a hand-rest, approximately five master-keys
 50 disposed thereon, a plate below said rest and means supporting said rest upon anti-friction bearings, said means permitting universal motion of said rest in the plane there-
 55 of and limiting the extent of said motion, a series of groups of contacts upon said plate arranged in correspondence with, and equal in number to, said keys, the contacts of each
 60 group being approximately eight in number and circularly arranged, the hand-rest being adapted to be moved so that any key may register with any contact of its corresponding group.

In testimony whereof he affixes his signature.

JOSEPH BARTLETT DAVIES.

Witnesses:

JOHN COOK,

L. B. DAVIES,

LESLIE BARTLETT DAVIES.