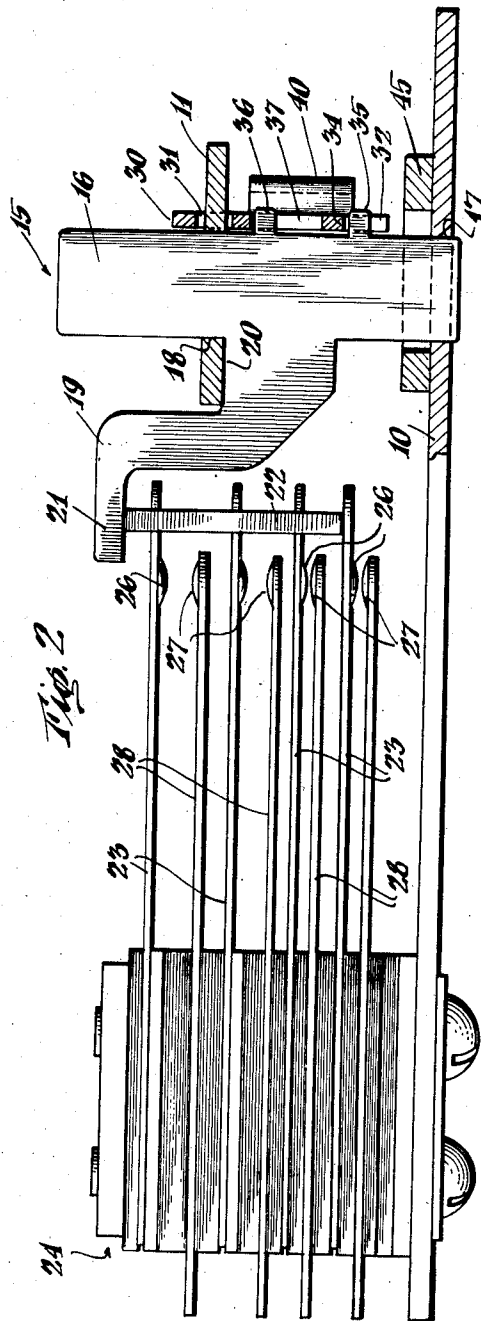
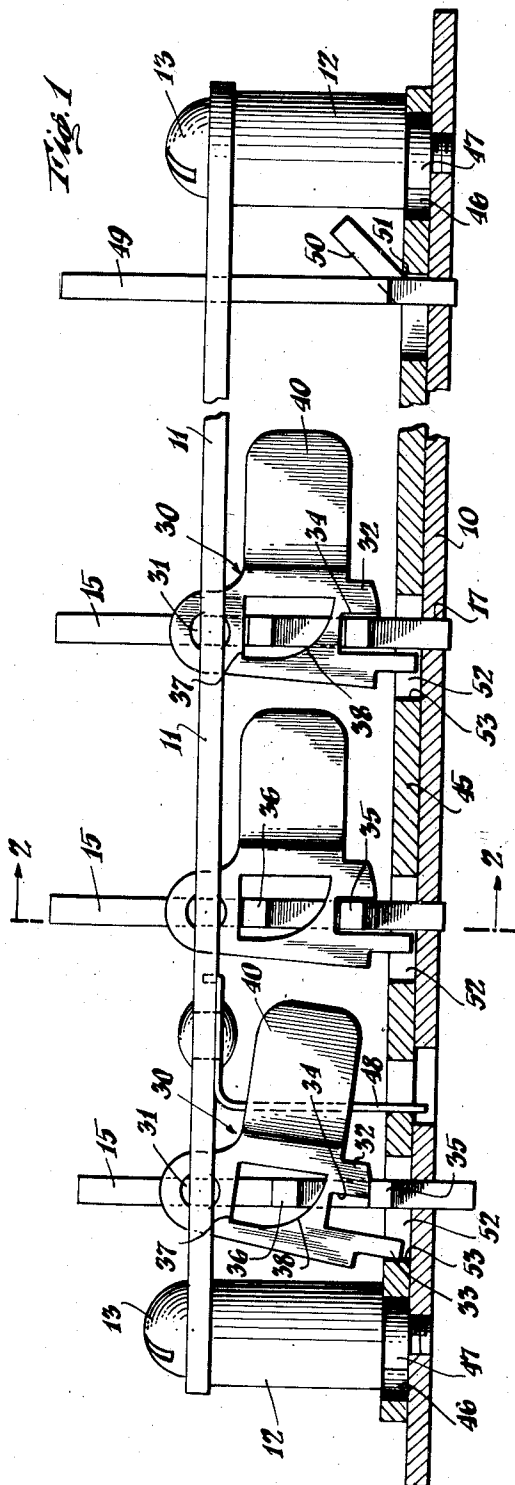


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CONTROL DEVICE FOR INTEROFFICE
COMMUNICATION SYSTEMS
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CONTROL DEVICE FOR INTEROFFICE
COMMUNICATION SYSTEMS

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This invention relates to control devices and, more particularly, to key controlled devices adapted for use in telephone and interoffice communication systems.

In many telephone and interoffice communication systems, the circuits are controlled by manually operated keys which enable the operator to interconnect selected stations as desired, or to connect one or more stations with a trunk line of the outside telephone system.

It is desirable in such systems to provide latching means for retaining each key in operating position after it has been actuated together with means for releasing the key from its latched position thereby allowing it to return to its normal or rest position.

Heretofore, this latching action has been effected by providing a spring actuated latch for each key which is tripped when the key is moved to operating position. The provision of a separate spring latch for each key is expensive and is also disadvantageous in that the springs must be installed in crowded parts of the apparatus with the result that they are relatively inaccessible and difficult to adjust.

It is an object of this invention to eliminate the difficulties encountered with spring actuated latches by providing a simple, inexpensive gravity latch for each key.

It is a further object of the invention to provide keys which are locked in operating position by the novel gravity operated latches and returned to their normal or rest positions, upon release of the latches, by the inherent resiliency of the contact springs actuated thereby.

It is a still further object to provide a gravity operated latch which is positive in operation and requires a minimum of adjustment.

The invention further contemplates a key controlled device which is economical in manufacture, of sturdy construction, and contains a minimum number of parts.

Other objects of the invention will be apparent from the following description and accompanying drawings taken in connection with the appended claims.

The invention accordingly comprises the features of construction, combination of elements, arrangement of parts, and methods of manufacture referred to above or which will be brought out and exemplified in the disclosure hereinafter set forth, including the illustrations in the drawings, the scope of the invention being indicated in the appended claims.

For a fuller understanding of the nature and

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objects of the invention as well as for specific fulfillment thereof, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a front elevational view, partially in section, of a key controlled device utilizing the novel gravity actuated latches; and

Figure 2 is a sectional view taken along the line 2—2 of Figure 1.

While a preferred embodiment of the invention is described herein, it is contemplated that considerable variation may be made in the method of procedure and the construction of parts without departing from the spirit of the invention. In the following description and in the claims, parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

Referring now to the drawings in detail, the control device may include a pair of spaced plate members 10 and 11 which are separated by spacers 12 and maintained in spaced position by bolts or screws 13.

A series of keys or levers 15 is mounted for vertical movement with respect to the plates 10, 11 and, to this end, each key comprises a rectangular portion 16 which is slidable within slots 17, 18 formed in the plate members 10 and 11, respectively. Each key further includes an integral projection 19 having a stop portion 20 which is adapted to engage the lower surface of the plate member 11 and thereby limit the upward movement of the key.

Each projection 19 also has a finger portion 21 which is engaged by an insulated contact arm actuator 22, this actuator being secured to a set of resilient contact arms 23 which are mounted on a stack assembly 24. The inherent resiliency of the contact arms 23 urges the actuator 22 and key 15 in an upward direction, Figure 2, so that each key is normally maintained in an elevated or rest position wherein the stop 20 is an engagement with the lower surface of plate member 11.

Each contact arm 23 carries a contact 26 which is adapted to engage a contact 27 mounted on an arm 28 extending from the stack assembly 24. The sets of contacts 26 and 27 for each key may be connected in circuit, as desired, by attaching leads or conductors to the respective contact arms 23 and 28.

In accordance with the invention, each key has associated therewith a latch 30 which is pivoted as at 31 to the upper plate member 11. This latch has a pair of spaced projections 32, 33 protruding

from the lower portion thereof which define a slot 34. A finger 35 which is integral with the key is disposed within the slot 34 when the key is in its upper or rest position. In addition, each key has a second finger 36 protruding therefrom which extends into an opening 37 in the latch and is adapted to engage a cam surface 38 thereon. A weighted portion 40 is formed integrally with each latch and urges it in a clockwise direction, Figure 1. Accordingly, when the key 15 is depressed into its operating position, the latch tilts by gravity and the projection 32 engages latch finger 35 thereby locking the key in its depressed position. If, for any reason, the weight of the portion 40 is insufficient to move the latch in the described manner, the finger 36 engages cam surface 38 and forces the latch to move thereby causing projection 32 to engage finger 35.

A device is provided for releasing the latches from their locked positions and this device comprises a plate member 45 which is slidably mounted on plate member 10. The sliding movement is permitted by slots 46 at the respective ends of the plate, each slot having a collar 47 therein which is integral with or fixed on the associated bolt 13. The plate 45 is urged to the position shown in Figure 1 by a spring 48 which is mounted on plate member 11 and extends into suitable slots in the plate members 10 and 45. The plate may be moved in a rightward direction, Figure 1, by depressing a release key 49 which is slidable in suitable slots in the plate members 10, 11 and which has an angular cam portion 50 thereon for engagement with a slotted portion 51 of the plate 45. A series of slots 52 is formed in the plate 45 and each slot is adapted to receive one of the latch projections 33. Accordingly, when the release key 49 is depressed, the plate 45 is moved rightwardly, Figure 1, causing a surface 53 of plate 45 to engage the projection 33 of each latch which was tripped before actuation of the release key. Thereupon, each of said latches is moved in a counterclockwise direction, Figure 1, thereby causing the projections 32 to move clear of fingers 35, and permitting the key to move upwardly to its normal or rest position.

The operation of the novel control device will be apparent from the foregoing description. When the keys are in their normal or rest position, the associated sets of contacts 26, 27 are open. When one of the keys 15 is depressed, the latch swings by gravity causing the engagement of the projection 32 with finger 35. Thereupon, the key is locked in its lower operating position in which the contacts are closed. It will be understood that each of the keys may be locked in this manner, if desired, until all of the keys 15 are depressed. When it is desired to release the keys, the lever 49 is depressed whereupon the latches are swung back to their original position by the plate 45, thereby allowing the keys 15 to return to their normal positions responsive to the upwardly directed pressure of the contact springs 23.

In accordance with the invention, individual springs are not utilized for locking each key and it is, therefore, not necessary to overcome the pressure of such individual springs when releasing the keys from their locked positions. In addition, only a few simple parts are required to make the novel control device and the gravity operated latches are extremely simple to assemble and adjust.

While the present invention, as to its objects and

advantages, has been described herein as carried out in specific embodiments thereof, it is not desired to be limited thereby but it is intended to cover the invention broadly within the spirit and scope of the appended claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a control device, the combination which comprises a plurality of key units individually displaceable from a rest position into an operating position, gravity-responsive means associated with each key to lock it in operating position after displacement thereof, and releasing means for operating all of said gravity-responsive means to release said keys from their operating positions and permit them to return to their rest positions.

2. In a control device having a plurality of keys, each key being displaceable from a rest position for operating an associated switching device, means for simultaneously locking said plurality of keys in operative position, said means comprising a like plurality of gravity displaceable latches, each responsive to its associated key and operable during displacement of said key to lock said key in position.

3. In a key control device, a pair of spaced parallel plates each having a slotted portion, said slotted portions being in register, a key slidably displaceable within said slotted portions and having a projection for limiting its displacement therein, said key having a pair of vertically spaced parallel fingers, and a latch pivoted on one of said plates, said latch having a pair of spaced projections of unequal length protruding from its lower portion and defining a slot therein, said latch further having an aperture formed therein, a portion of the periphery of said aperture being shaped to define a cam surface, the upper key finger extending into said aperture and engaging said cam surface upon displacement of said key, the lower key finger extending into the latch slot and engaging the shorter latch projection upon displacement of said key, said latch being further provided with a weighted portion whereby it is urged in a clockwise direction upon the displacement of said key.

4. In a key control device, a pair of spaced parallel plates each having a plurality of slotted portions, said slotted portions being in register, a plurality of keys, each of said keys being slidably displaceable within a pair of said slotted portions and having a projection for limiting its displacement therein, each of said keys having a pair of vertically spaced parallel fingers, and a latch for each of said keys pivoted on one of said plates, a pair of spaced projections of unequal length protruding from the lower portion of said latch and defining a slot therein, said latch having an aperture formed therein, a portion of the periphery of said aperture being shaped to define a cam surface, the upper key finger extending into said aperture and engaging said cam surface upon displacement of the associated key, the lower key finger extending into the latch slot and engaging the shorter latch projection upon displacement of said associated key, each latch being provided with a weighted portion whereby it is urged in a clockwise direction upon the displacement of its associated key, thus retaining each key in displaced position regardless of the displacement of any other key.

5. In a key control device, a pair of spaced parallel plates each having a plurality of slotted

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portions, said slotted portions being in register, a plurality of keys, each of said keys being slideably displaceable within a pair of said slotted portions and having a projection for limiting its displacement therein, each of said keys having a pair of vertically spaced parallel fingers, a latch for each of said keys pivoted on one of said plates, a pair of spaced projections of unequal length protruding from the lower portion of said latch and defining a slot therein, said latch having an aperture formed therein, a portion of the periphery of said aperture being shaped to define a cam surface, the upper key finger extending into said aperture and engaging said cam surface upon displacement of the associated key, the lower key finger extending into the latch slot and engaging the shorter latch projection upon displacement of said associated key, said latch being provided with a weighted portion whereby it is urged in a clockwise direction upon the displacement of its associated key, and means for releasing said latch comprising a third plate

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parallel to said pair of spaced plates, said third plate being slidably mounted on the lower of said spaced plates and having slotted portions for receiving the longer of said latch projections, spring means for retaining said third plate in position, and release means for moving said third plate out of said position whereby said longer latch projection is moved in a counterclockwise direction.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,086,029	Craft	Feb. 3, 1914
1,378,950	Hargan	May 24, 1921
2,387,719	Curran	Oct. 30, 1945