June 21, 1938. R. G. RIESMEYER 2,121,262

ORGAN KEY CONTROL APPARATUS

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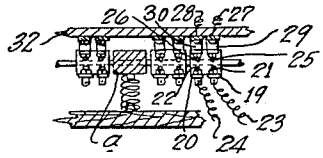
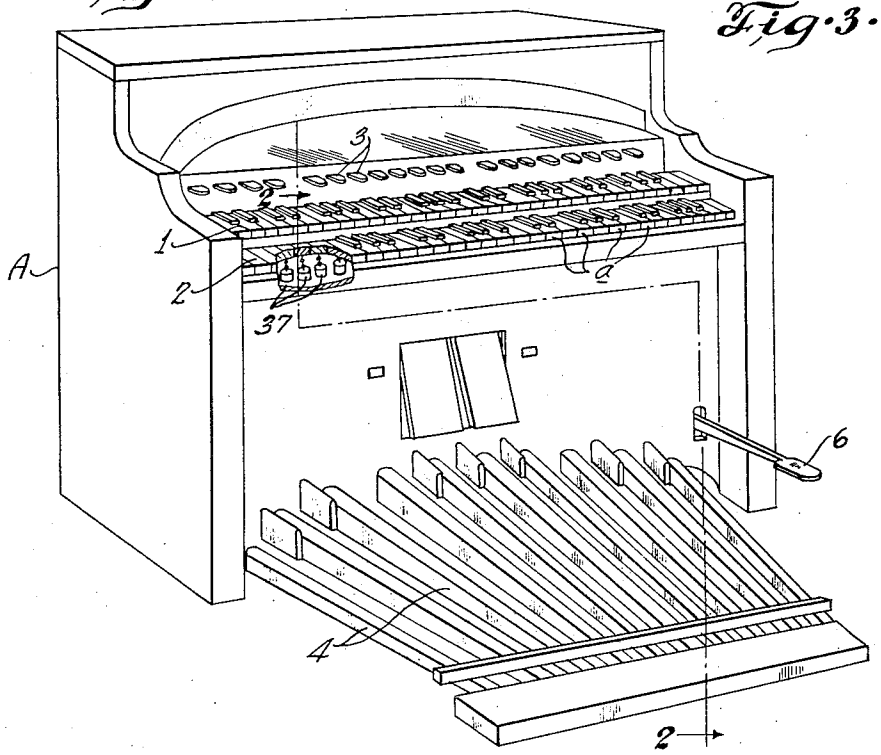


Fig. 3.

Fig. 1.



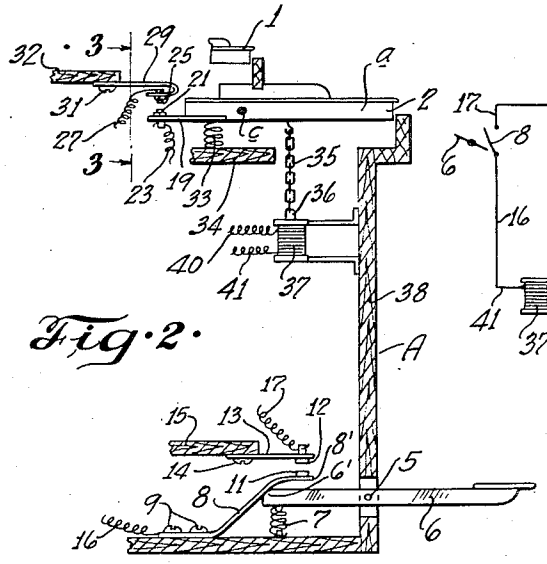


Fig. 2.

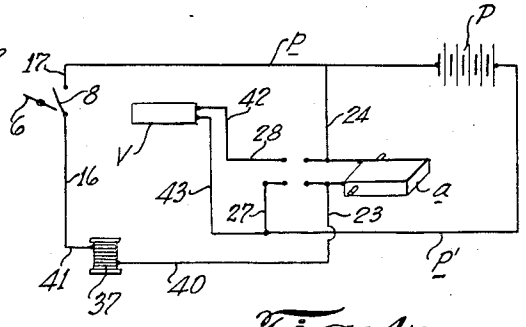


Fig. 4.

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ORGAN KEY-CONTROL APPARATUS

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15 Claims. (Cl. 84—441)

This invention relates generally to organs and, more particularly, to a certain new and useful improvement in organ key-control apparatus.

Frequently, in the operation of an organ, the organist desires to create a sustained sound for a predetermined number of beats and, at the same time, manually manipulate other instrumentalities of the organ. At the present time, so far as I am aware, such result or effect cannot be accomplished without maintaining hand pressure upon the several organ keys corresponding to the notes in the chord or sound desired.

This invention, hence, has for its primary object the provision for an organ of a unique key-controlling apparatus for effecting a sustained sound, chord, or series of chords with a total elimination of hand-pressure upon the particular organ-keys for the entire duration of the sound interval or measure.

This invention has for a further object the provision of a key-control apparatus of the type and for the purpose stated which is of simple structure, which may be readily and inexpensively installed upon the organ, which is conveniently operable at will, and which is efficient in the performance of its intended functions.

And with the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawing,—

Figure 1 is a perspective view of an organ console constructed in accordance with and embodying the present invention, a section of the keyboard being broken away for exposing in more detail the key-controlling mechanism;

Figure 2 is a vertical fragmentary sectional view of the organ console, taken approximately along the line 2—2, Figure 1;

Figure 3 is a fragmentary vertical sectional view of the organ key mechanism, taken approximately along the line 3—3, Figure 2; and

Figure 4 is a schematic wiring diagram of the electrical connection between the various operative parts of the key-controlling mechanism.

Referring now in more detail and by reference characters to the drawing, which illustrates a preferred embodiment of the present invention, A designates an organ console having a conventional key-board, which includes an upper manual 1, a lower manual 2, a stop-row 3, and a pedal clavier 4.

Pivotally mounted, as at 5, in the base of the console A in convenient juxtaposition to the clavier 4 for foot operation, is a pedal 6 resiliently urged by a coil-spring 7 into operative engagement at its inner end 6' with the vertically shiftable free end 8' of an arcuate electrically conductive leaf-spring 8 suitably fixed at its other end, as by screws 9, to the floor of the console A, the spring end-portion 8' being provided with a contact-point 11 for electrical circuit completing engagement with a contact-point 12 mounted upon a supporting bar 13, in turn, rigidly fixed, as by a screw 14, to a framework-portion 15 of the organ console A, conducting wires 16, 17, being connected to the spring-leaf 8 and the contact-point 12, respectively, for purposes presently appearing and all as best seen in Figure 2. The manuals 1 and 2 are composed of a plurality of keys *a* pivotally mounted in the manual structure, as shown at *c* in Figure 2, and arranged in the manner of a conventional piano key-board.

Rigidly disposed upon the inner end of each of the respective keys *a*, are outwardly extending parallel contact-bars 19, 20, having respectively mounted thereon contact-points 21, 22, electrically connected to lead wires 23, 24, and shiftable with the movement of the inner end of the key *a* for circuit-completing contact respectively with stationary contact-points 25, 26, electrically connected to lead wires 27, 28, and mounted on stationary contact-bars 29, 30, in turn, rigidly attached, preferably by means of screws 31, to a framework-portion 32 of the organ console A, as best seen in Figures 2 and 3, thus providing each key *a* with a pair of simultaneously operable, but electrically separate, circuit completing switches for purposes presently appearing.

Mounted at one end upon a framework-portion 34 of the organ console A and suitably attached at their respective other ends to the under side of the respective keys *a*, are coil spring-members 33 for yieldingly retaining the several keys *a* in normal approximately horizontal position, as best seen in Figure 2, each of the respective keys *a* being further provided outwardly from their respective pivot-points *c* with a depending flexible member preferably in the form of a chain 35, which is suitably attached at its other end to the upper end of a core-bar 36 disposed for free shiftable movement within the core-aperture of a solenoid 37 rigidly mounted upon a framework-portion 38 of the organ console A and provided with a conventional type of magnetic winding or coil electrically connected at its ends respectively to lead wires 40, 41, for purposes presently appearing.

The various described component parts of the

organ are electrically connected in circuit with power leads *p*, *p'*, from the power source P of the organ, as follows,—the lead **17** of the foot-pedal switch **11**—**12** is connected directly to the power lead *p*; the lead **16** is connected to the lead **41** of the solenoid **37**; the lead **24** of the key-switch assembly is connected directly to the power lead *p*, the corresponding lead wire **28** being connected to the lead wire **42** of the organ pipe valve control mechanism V, which latter is entirely conventional and, hence, neither shown nor described in detail; and the lead wire **23** of the key-switch assembly is connected to the lead wire **40** of the solenoid, the corresponding lead wire **27** and the second lead wire **43** of the organ pipe valve operating mechanism V being both connected directly to the power lead *p'*, all as best seen in the wiring diagram in Figure 4.

In use, when the organist, in the course of a musical rendition, comes to a point at which he desires to create a sustained sound or chord, the pedal **6** is depressed by foot-actuation. The inner end **6'** of the pedal **6** is thereupon moved upwardly against the spring-leaf **8**, and the latter thereby shifted for carrying the contact-point **11** into circuit-closing engagement with the relatively fixed contact **12**. By reference to the wiring diagram in Figure 4, it will be apparent that such circuit-closing operation electrically connects only the lead wire **41** of the solenoid **37** to a power lead wire, thus, in effect, conditioning the solenoid **37** for operation whenever the other lead wire **40** is also connected to a power lead wire.

Meanwhile, when any one or more of the organ keys *a* is manually depressed, the inner end of such key or keys *a* will yieldingly move upwardly against the tension of the spring **33** and thereby bring the contact points **21**, **22**, into respective circuit closing engagement with the relatively fixed contact points **25**, **26**. Simultaneously, the corresponding chain **35** will move longitudinally downwardly, thereby permitting the core-bar **36** to drop further within the core-aperture of the solenoid **37**. By reference again to the wiring diagram in Figure 4, it will be seen that, upon such key depression, two results will concurrently take place. Since one lead wire **43** of the pipe valve control mechanism V is directly connected to the power lead *p'*, the circuit-closing action of the contact points **22**, **26**, will complete the electrical circuit to the mechanism V with attendant production of an organ note or sound associated with the particular organ key or keys *a* so manually depressed. Similarly, since the circuit-closing action of the foot-pedal **6** has conditioned the respective solenoids **37** for effective magnetic operation, the subsequent circuit-closing action of the contact points **21**, **25**, will complete the electrical circuit to the particular solenoid or solenoids **37** associated with the particular key or keys *a*. The solenoid **37**, so energized, thereupon exerts a magnetic force upon the core-bar **36** to retain the latter in downward or retracted position for holding the particular key *a* also in downwardly or depressed position when manual pressure is removed. It should further be noted that each of the solenoids **37** may only be energized by the manual depression of the particular organ key *a* with which it is associated.

Since the energized solenoid **37** acts to hold down the particular key *a*, as above stated, the organ note will continue to be sounded, and the solenoid energizing circuit will remain in closed condition as long as the foot-pedal **6** is held down. As soon as it is desired to release the key or keys *a* and terminate the sustained note or chord thereby created, the foot-pedal **6** may be released, whereupon the solenoid-energizing circuit is broken by the separation of the contact points **11**, **12**. The solenoid **37** thus becomes de-energized, releasing the core-bar **36**, whereupon the key *a* will return to normal position under impulse of the spring **33**, thereby disengaging the respective contact points **21**, **25**, and **22**, **26**.

It will be evident that any and all keys *a* manually depressed during the depression of the foot-pedal **6** will automatically continue in depressed position until pressure upon the foot-pedal **6** is removed and the circuit through the main-contacts **11**, **12**, broken, thus leaving the hands of the organist free for movement over the keyboard as may be required for the proper rendition of the particular musical number.

Thus, the present invention provides a unique organ key-controlling apparatus, which appreciably widens the scope of the instrument, which adds greatly to the convenience of operation thereof, and which may be economically and efficiently incorporated in any present form of pipe or reed organ without necessitating any appreciable structural modification in basic design.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the organ may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is,—

1. In combination with an organ having a plurality of keys, key-control means associated with a selected organ key for retaining the key in a predetermined position, means for conditioning the key-control means for operation, and means actuated by movement of the key for responsively actuating the key-control means when the latter has been conditioned for operation.

2. In combination with an organ having a plurality of keys, key-control means including a solenoid operatively associated with a selected organ key for retaining the key in a predetermined position, means for conditioning the solenoid for operation, and means actuated by movement of the key for responsively energizing the solenoid when the latter has been conditioned for operation.

3. In combination with an organ having a plurality of keys, key-control means associated with a selected organ key for retaining the key in a predetermined position, means for conditioning the key-control means for operation, and means including a switch actuated by movement of the key for responsively actuating the key-control means when the latter has been conditioned for operation.

4. In combination with an organ having a plurality of keys, key-control means associated with each of the organ keys for retaining the key in a predetermined position, means including a switch for conditioning the key-control means for operation, and means including a switch actuated by movement of the key for responsively actuating the key-control means when the latter has been conditioned for operation.

5. In combination with an organ having a plurality of keys, key-control means including a solenoid operatively associated with the organ key for retaining the key in a predetermined posi-

tion, means including a switch for conditioning the solenoid for operation, and means actuated by movement of the key for responsively energizing the solenoid when the latter has been conditioned for operation.

6. In combination with an organ having a plurality of keys, key-control means including a solenoid operatively associated with the organ key for retaining the key in a predetermined position, means for conditioning the solenoid for operation, and means including a switch actuated by movement of the key for responsively energizing the solenoid when the latter has been conditioned for operation.

7. In combination with an organ having a plurality of keys, key-control means including a solenoid operatively associated with the organ key for retaining the key in a predetermined position, means including a switch for conditioning the solenoid for operation, and means including a switch actuated by movement of the key for responsively energizing the solenoid when the latter has been conditioned for operation.

8. In combination with an organ having a plurality of keys, key-control means including a solenoid, a core-bar operatively disposed within the solenoid for retractile movement therein when the solenoid is energized, a flexible connection member attached at its one end to the bar and at its other end to the organ-key for retaining the key in a predetermined position, means for conditioning the solenoid for operation, and means actuated by movement of the key for responsively energizing the solenoid when the latter has been conditioned for operation.

9. In combination with an organ having a plurality of keys, key-control means including a solenoid operatively associated with the organ key for retaining the key in a predetermined position, first switch means connected in series with one terminal of the solenoid for conditioning the solenoid circuit for electrical completion, and second switch means connected in series with the other terminal of the solenoid and actuated by movement of the key for responsively energizing the solenoid when the first switch means is closed.

10. In combination with an organ having a plurality of keys, a normally open electrical circuit, means included in the circuit and operatively associated with a selected key for retaining the key in a predetermined note-sounding position upon closing of the circuit, means actuated by movement of the key for responsively partially closing the circuit, and means including a foot-actuated member for completing closure of the circuit.

11. In combination with an organ having a plurality of keys, a normally open electrical circuit, means comprising a solenoid included in the circuit and associated with a selected key for retaining the key in a predetermined note-sounding position upon closing of the circuit, means actuated by movement of the key for responsively partially closing the circuit, and means including a foot-actuable member for completing closure of the circuit.

12. In combination with an organ having a plurality of keys, a normally open electrical circuit including a pair of fixed contact-members, means comprising a solenoid included in the circuit and associated with a selected key for retaining the key in a predetermined note-sounding position upon closing of the circuit, means including a movable contact-member actuated by movement of the key for engaging one of the fixed contact-members for partially closing said circuit, and means including a second foot-actuated contact-member for engaging the other of said fixed contact-members for completing closure of the circuit.

13. In combination with an organ having a plurality of spring-pressed keys, a normally open electrical circuit including a pair of fixed contact-members, means comprising a solenoid included in the circuit and operatively associated with a selected key for retaining the key in a predetermined note-sounding position upon closing of the circuit, means including a movable contact-member actuated by movement of the key for engaging one of the fixed contact-members for partially closing the circuit, and means including a spring-pressed foot-pedal and a second movable contact-member actuable by the pedal for engaging the other fixed contact-member for completing closure of the circuit, the key being returnable to normal position only upon disengagement of the second movable contact-member from said second fixed contact-member.

14. In an organ having an electrical power source, a pivotally mounted note-sounding key, a solenoid mounted in juxtaposition to the key, a solenoid core-bar disposed within the solenoid and operatively connected to the key, a first electrical contact mounted on the key for movement therewith, a second electrical contact rigidly mounted on the organ in juxtaposition to the first contact for circuit-closing engagement therewith upon authorized movement of the key, a pedal pivotally mounted in the organ, and an electrical switch operatively mounted for circuit-closing actuation by the pedal, said switch being connected in series with one electrical terminal of the solenoid and one terminal of the electrical power source of the organ, the other terminal of the solenoid being connected to the first electrical contact point, the second electrical contact point being connected to the other terminal of the electrical power source of the organ.

15. In an organ having an electrical power source, a plurality of note-sounding keys, an electrical switch operatively associated with, and actuated by, each of the keys for closing an electric circuit when the key is in note-sounding position, a solenoid operatively associated with each key for holding the key in note-sounding position when the solenoid is energized, each of said solenoids having a pair of electrical leads, a second electrical switch having a first terminal connected to the power source and a second terminal connected in common to one lead of all the solenoids, the other lead of the solenoid being connected to the power source through the particular switch associated with its note-sounding key whereby all of the solenoids may be simultaneously conditioned for operation by closing the second switch so that each particular solenoid may be finally separately energized when conditioned by movement of its particular organ key to note-sounding position.

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