July 14, 1931. J. H. HAMMOND, JR 1,814,472

ORGAN CONTROL

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Fig. 1

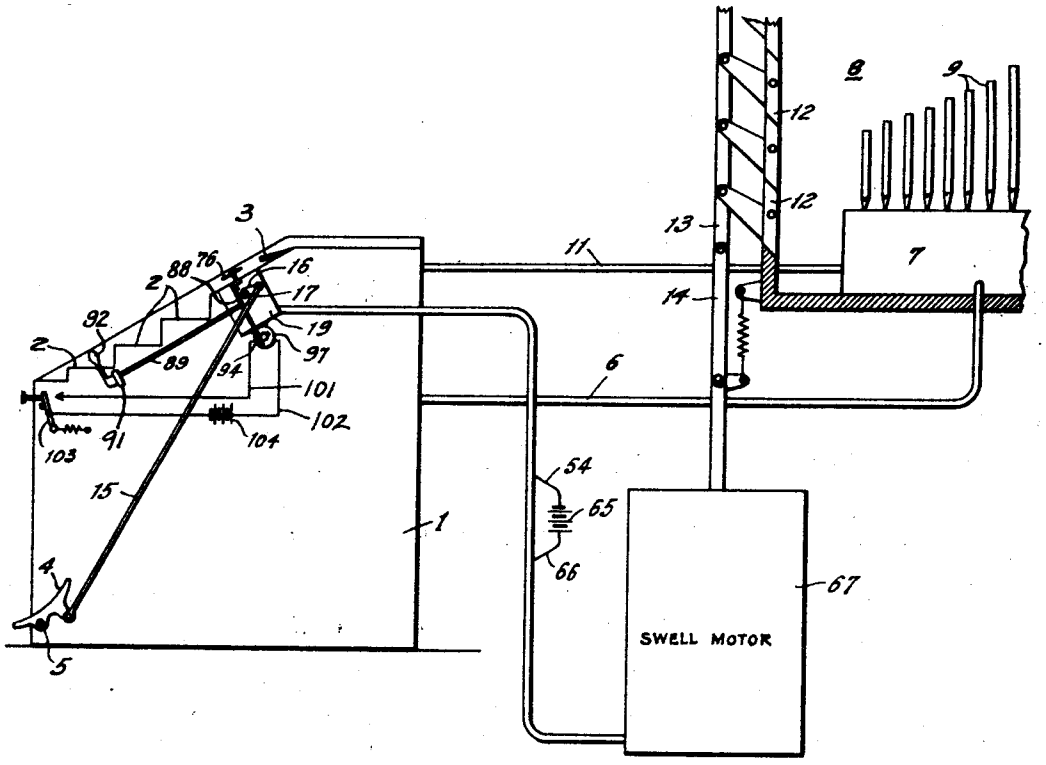
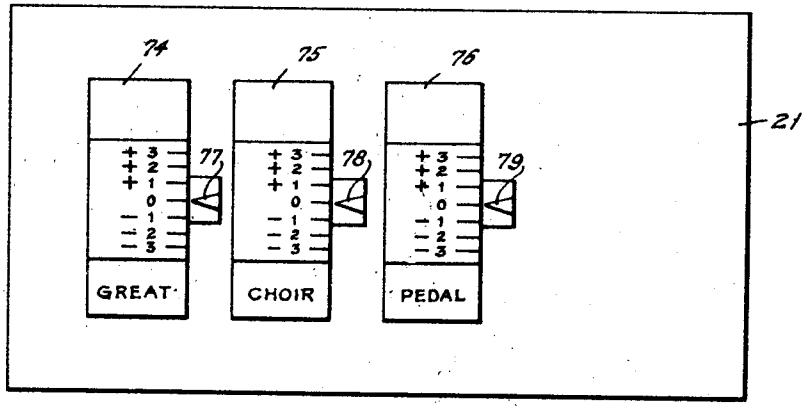


Fig. 2



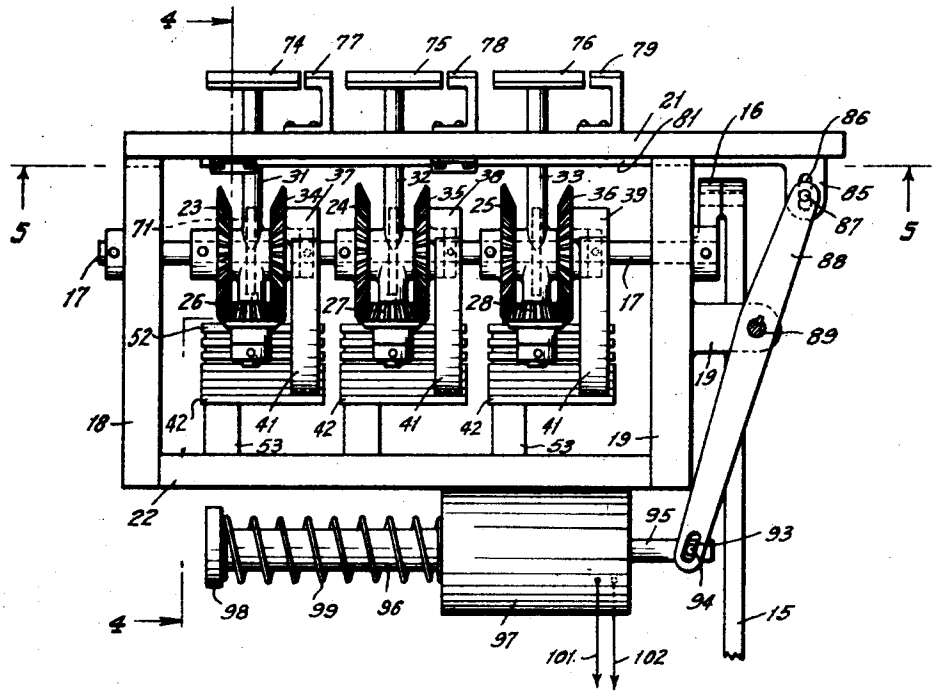
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Fig. 3



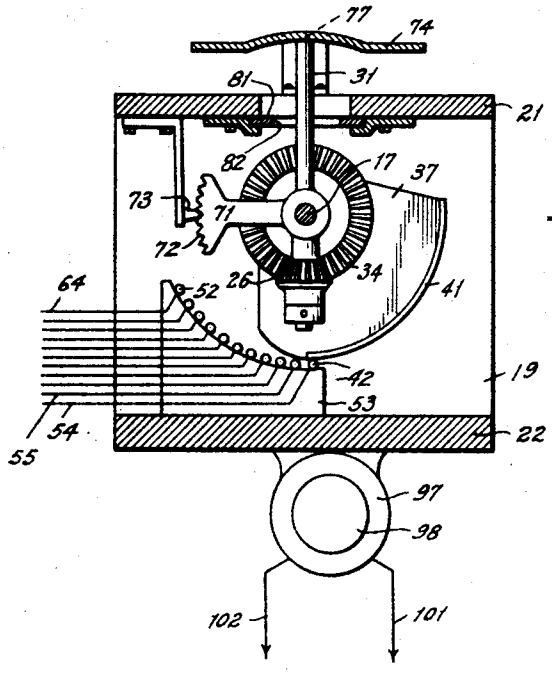


Fig. 4

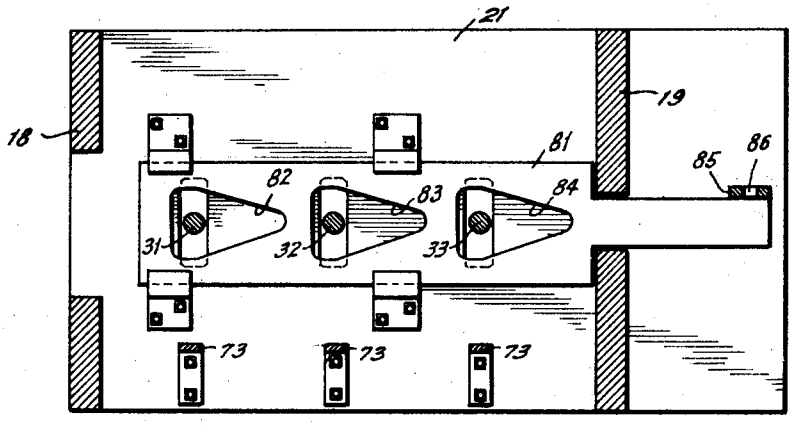
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Fig. 5



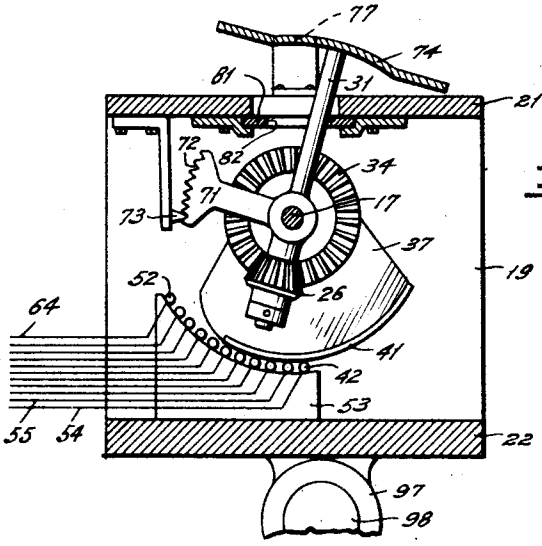


Fig. 6

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Patented July 14. 1931 1,814,472

UNITED STATES PATENT OFFICE

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ORGAN CONTROL

Application filed November 26, 1929. Serial No. 409,819.

The invention relates to a musical instrument and more particularly to an organ.

The present invention provides means in connection with the swell control of an organ for advancing or retarding the action of any individual set of swells with regard to their normal operation.

According to the present invention every one of the swell chambers has associated therewith a regulator. These regulators control a plurality of electrical circuits which in turn control the operation of the respective swell shutter motors. The shutters of the swells operated by these swell motors will consequently be opened an amount corresponding to the position of said regulators. In this manner any desired relationship in the position of the shutters of the individual swell chambers can be effected by the proper adjustment of the corresponding regulators.

The invention also consists in certain new and original features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, the mode of its operation and the manner of its organization may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which

Fig. 1 is a side elevation of this system as applied to the console of an organ;

Fig. 2 is a plan view of the swell control mechanism;

Fig. 3 is a front elevation of same;

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

Fig. 5 is a sectional view taken on line 5—5 of Fig. 3; and

Fig. 6 is similar to Fig. 4 with the parts in a different position.

Like reference characters denote like parts in the several figures of the drawings.

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.

In the form of the invention shown in the accompanying figures, an organ console 1 is provided with the usual key boards 2, stop tablets 3, and swell control pedal 4. This pedal is mounted for rotation about a pin 5. The keys 2 are connected by means of a cable 6 to an organ chest 7 which is located in an organ swell chamber 8. This chest is provided with the usual organ pipes 9. The stop action of this chest is connected by means of a cable 11 to the stop tablets 3. The front of the organ chest 8 is provided with a plurality of shutters 12 which are connected to a vertical rod 13, which is connected by means of a link 14 to a swell motor 67.

The pedal 4 is connected to one end of a link 15. The other end of this link is pivotally connected to an arm 16 which is pinned to a shaft 17 journaled in brackets 18 and 19. Secured to the top of the brackets 18 and 19 is a plate 21 and to their lower ends a cross member 22. Pinned to the shaft 17 are three bevel gears 23, 24 and 25 which mesh with three bevel pinions 26, 27 and 28. These pinions are loosely mounted on the ends of three members 31, 32 and 33, which in turn are loosely mounted on the shaft 17. Also loosely mounted on the shaft 17, and meshing with the pinions 26, 27 and 28 are three bevel gears 34, 35 and 36. Secured to these bevel gears are three segments of insulating material 37, 38, and 39. Secured to the faces of these figures are contact strips 41. These strips engage a plurality of spring contacts 42—52 mounted on a block of insulation 53, which is secured to the cross member 22. These contacts are connected to a plurality of conductors 54—64. The conductor 54 is connected to

a battery 65, the other side of which is connected by conductor 66 to the common connection of a swell motor 67. The conductors 55—64 are connected to the individual magnets of this swell motor. This swell motor is of standard well known construction and may take the forms of that shown in Figs. 5 and 6 of United States Patent 1,722,977 dated July 30, 1929.

The members 31, 32 and 33 are provided with arms 71, having at their end, toothed segments 72. The teeth of these segments are engaged by spring pressed detents 73. To the upper ends of the members 31, 32 and 33 are secured regulators in the form of tablets 74, 75 and 76, upon which are designated the particular organ swell they control, such as Great, Choir or Pedal. They also have designated thereon a suitable range of numbers such as range 3 to 3. Located adjacent to these tablets are three pointers 77, 78 and 79 for indication on said numbers.

Slidably mounted on the under surface of the plate 21 is a plate 81 which is provided with three triangular openings 82, 83 and 84 through which pass the members 31, 32 and 33. The end of the plate 81 is bent down to form a bracket 85, which is provided with a slot 86. Sliding in this slot is a pin 87 carried by the end of an arm 88, which is secured to a rod 89, one end of which is pivoted to the bracket 19. The other end of this rod has a bearing in a bracket 91 and has secured thereto a handle 92. The other end of the arm 88 is provided with a slot 93 in which slides a pin 94 carried on a rod of non-magnetic material 95 which is secured to the end of a core 96 of a solenoid 97. Secured to the end of this core is a collar 98, between which and the solenoid is disposed a coil spring 99. The winding of the solenoid 97 is connected by two conductors 101 and 102 to a battery 104, and to a switch 103 located in the front of the console 1.

In the operation of this invention the members 31 to 33 are normally in the position shown in Figs. 2, 3, 4 and 5. The organ is played in the usual manner by means of the keys 2, and the stops are controlled by means of the stop tablets 3. Initially the swell pedal 4 is in the position shown, and the arm 16 is in its uppermost position. The sectors 37 to 39 are in the position shown in Fig. 4, and the swell shutters 12 are closed as shown in Fig. 1. If it is now desired to open these shutters the swell pedal 4 is rotated in a clockwise direction as seen in Fig. 1, thus rotating the arm 16 and the shaft 17 in a like direction. This will cause a similar rotation of the bevel gears 23, 24 and 25 which by means of the pinions 26, 27 and 28 will cause a rotation of the bevelled gears 34, 35 and 36 in the opposite direction or in a clockwise direction as seen in Fig. 4. This will cause the segments 37 to be rotated a like amount in the same direction, thus causing the contacting strip 41 to make successive contact with the contacts 42—52. As it does so it closes a circuit from the battery 65, conductor 54, contact 42, and segment 41 to the contacts 43—52 in succession. This causes the swell motor 67 to operate step by step in a manner similar to that described in the aforesaid United States Patent #1,722,977. The actuation of this motor causes the link 14 and the rod 13 to be moved downwardly an amount depending upon the number of contacts which are engaged by the segment 41. This causes the swell shutters 12 to be opened a proportional amount. In this way, these swell shutters are opened an amount proportional to the motion of swell pedal 4. The other sectors 38 and 39 control the swell shutters of the other swell chambers not shown.

If it is desired to have the swell shutters of the Great Organ chamber opened more than those of the other chambers, the tablet 74 is shifted as shown in Fig. 6 to any selective position with reference to the pointer 77. This causes a rotation of the member 31 in a clockwise direction about the shaft 17. As it does so the pinion 26 will roll along the bevel gear 23, causing the bevel gear 34 by means of a differential action, to be rotated in a clockwise direction through twice the angle through which the member 31 has been rotated. This causes the segment 37 to be rotated a like amount, thus causing the contact strip 41 to engage the contacts 42—47. As shown in Fig. 6 as the circuit is closed through the corresponding circuits of these contacts, the swell motor 67 is actuated to open the swell shutters 12 a corresponding amount. If the swell pedal 4 is now rotated in a clockwise direction, the bevel gear 34 will be rotated in a clockwise direction in a manner similar to that already described. This will cause the sector 37 to be further rotated in a clockwise direction (Fig. 6) thereby causing the contact strip 41 to engage the rest of the contacts 48—52 in succession thus opening the swells 12. In this way the swell shutters 12 of the Great Organ will initially be opened a predetermined amount, and as the other swell shutters of the Choir and Pedal organs are gradually opened, the swell shutters of the Great Organ will be opened more fully, thus maintaining these swell shutters in advance of the swell shutters of the other organs.

If it is desired to have the swell shutters retarded the tablet 74 is shifted in the other direction thus rotating the member 31 in a counter clockwise direction. This by means of the differential action of the gears will cause the sector, together with the plate 41 to be moved through twice the angle in the same direction. Thus, when the swell pedal 4 is rotated in a clockwise direction it will be some time before the contact strip 41 engages

the contacts 42—52. In this way the action of the swell shutters 12 is retarded so that the swell shutters of the Choir and Pedal organ are opened first before those of the Great Organ.

The tablets 74, 75 and 76 can be restored to their normal position by closing switch 103. This effects the energization of the solenoid 97 and the movement of the core 96 to the right with a consequent movement of the plate 81 to the left (Figs. 3 and 5) until the apex of the triangular openings 82, 83 and 84 are disposed adjacent the members 31, 32 and 33 respectively. This action will restore the alignment of these members.

Upon the opening of the switch 103 the solenoid 97 will be deenergized, causing the movement of the core 96 to the left under the action of the spring 99. This will restore the plate 81 to the position shown in Fig. 5 so as to enable the tablets 74, 75 and 76, to be selectively reset. The shifting of the plate 81 can also be accomplished by the manipulation of the handle 92.

In this manner a very simple and effective means is provided for restoring all of the regulators to a position for normal operation in which all the shutters are opened a like amount.

It should also be noted that any pre-determined relative position of the individual swell chambers can be effected by positioning the regulators associated with said swell chambers into corresponding positions. This relative position effects a corresponding retardment or advancement in the action of any individual set of swells with regard to their normal operation. The various swells of the organ can also be controlled thereby to effect a predominant or minor intensity action in any selected organ chamber.

While certain novel features of the invention have been shown and described and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes in the forms and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. In an organ, a plurality of swell chambers, a variable closure means associated with each of said swell chambers, a swell control means for operating all of said closure means together, and means for actuating each of said closure means independently of each other.

2. In an organ, a plurality of swell chambers, a variable closure means associated with each of said swell chambers, a foot pedal means responsive to the actuation of said foot pedal for operating all of said closure means together, and means for actuating each of said closure means independently of each other.

3. In an organ, a plurality of swell chambers, a variable closure means associated with each of said swell chambers, a swell control means for operating all of said closure means together, and means for selectively advancing the action of any one of said closure means with respect to the other closure means.

4. In an organ, a plurality of swell chambers, a variable closure means associated with each of said swell chambers, a swell control means for operating all of said closure means together, and means for selectively retarding the action of any one of said closure means with respect to the other closure means.

5. In an organ, a plurality of swell chambers, a variable closure means associated with each of said swell chambers, a swell control means for operating all of said closure means together, and means for selectively retarding or advancing the action of any number of closure means with respect to the other closure means.

6. In an organ, a plurality of swell chambers, a set of shutters associated with each of said swell chambers, a swell control means for operating all of said sets of shutters together, and means for selectively retarding or advancing the action of any one set of shutters with respect to the other sets.

7. In an organ, a plurality of swell chambers, a variable closure means associated with each of said swell chambers, a regulator corresponding to each of said closure means and means operable in acordance with the position of said regulators for effecting a pre-determined relationship in the position of said closure means.

8. In an organ, a plurality of swell chambers, a variable closure means associated with each of said swell chambers, a swell control means for operating all of said closure means together, means for selectively retarding or advancing the action of any number of closure means with respect to the other closure means, and means for restoring all of said closure means into mutual similar positions.

9. In an organ, a plurality of swell chambers, a variable closure means associated with each of said swell chambers, means for disposing said closure means in any pre-determined relative position, and a swell control means for operating all of said closure means while maintaining said closure means in said pre-determined relative position.

10. In an organ, a plurality of swell motors, means for selectively retarding or advancing the action of any one of said swell motors a pre-determined amount with respect to the other motors, and means for operating all of said motors synchronously.

11. In an organ, a plurality of swell chambers, a variable closure means asociated with each of said swell chambers a swell motor

connected to each of said closure means, a set of electrical circuits arranged to control each of said motors, a contact means associated with each of said sets for progressively closing each circuit of its associated set, means for selectively retarding or advancing the actuation of anyone of said contact means a pre-determined amount, and means for synchronously actuating all of said contact means.

In testimony whereof I have hereunto set my hand.

JOHN HAYS HAMMOND, JR.