

June 9, 1964

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3,136,869

INTERLOCKING CONTROL TABLETS FOR USE IN AN ORGAN

Filed June 21, 1962

3 Sheets-Sheet 1

Fig. 1.

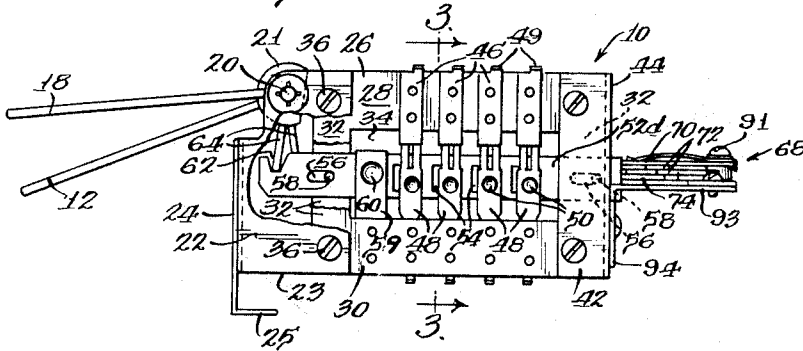
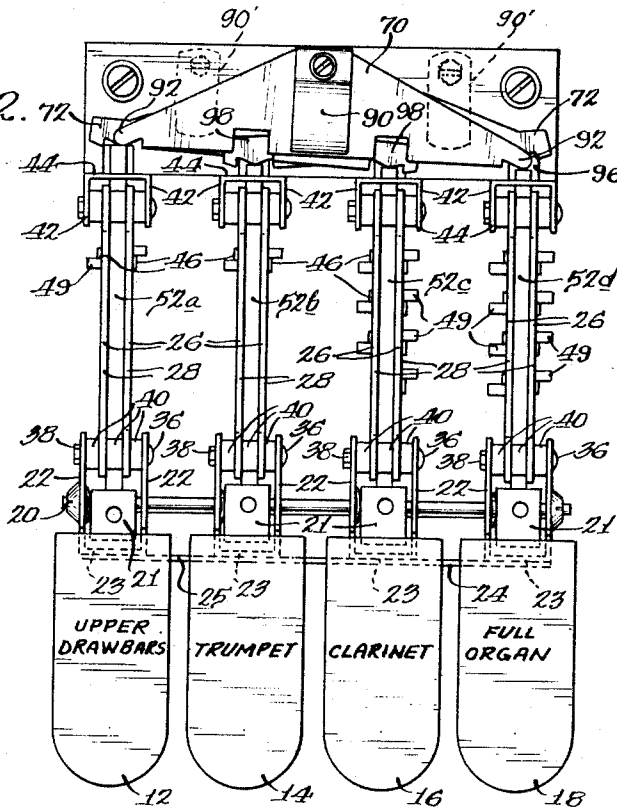


Fig. 2.



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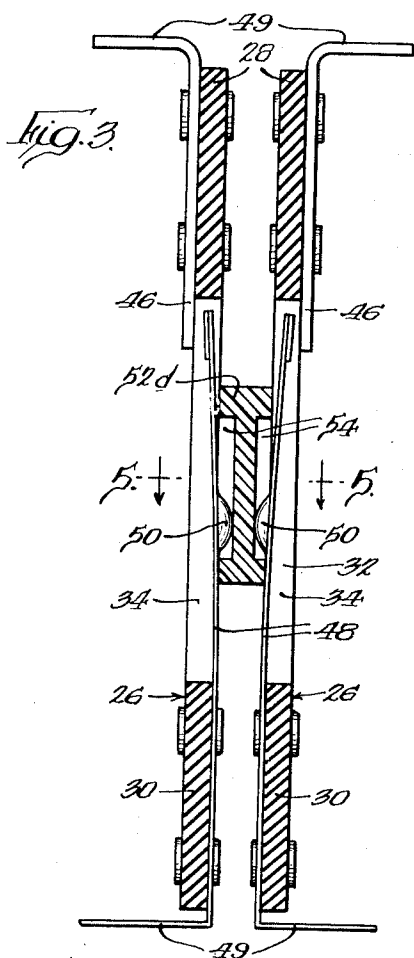
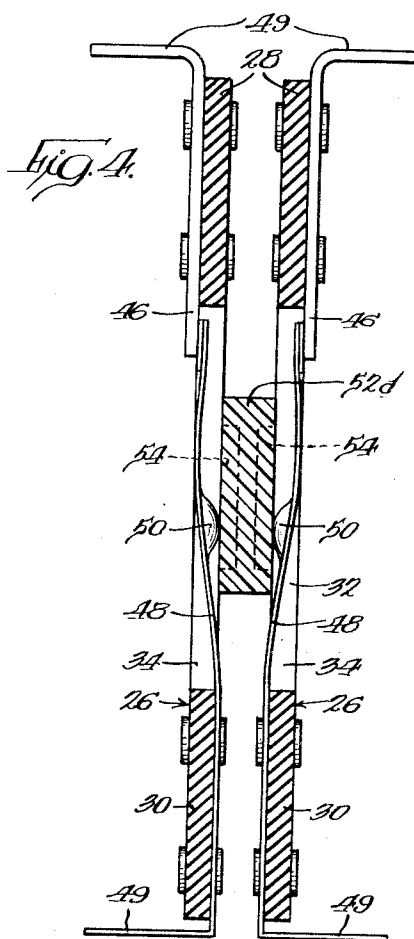
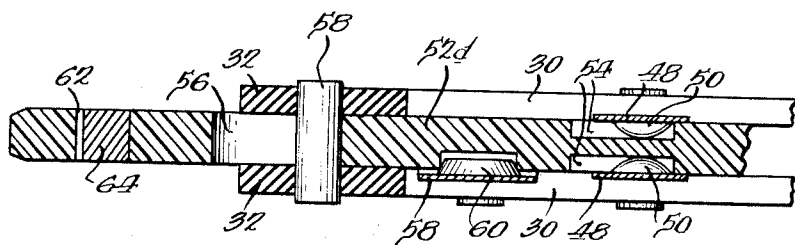
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

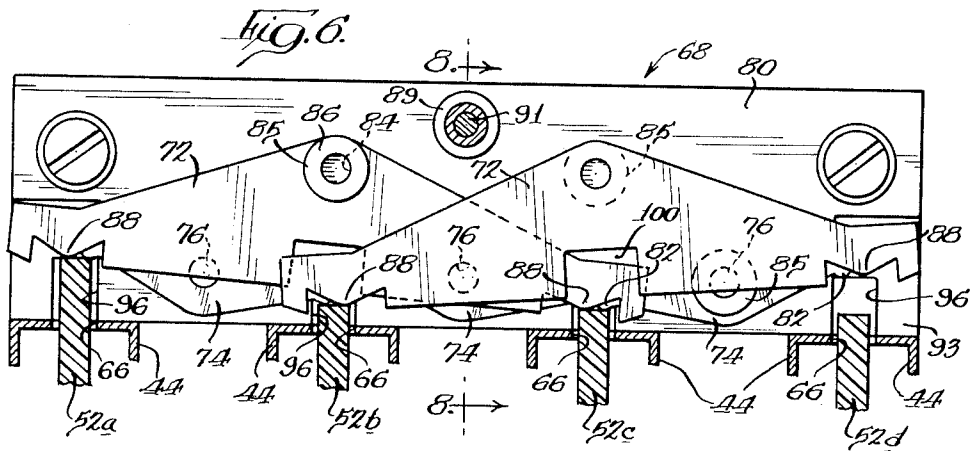
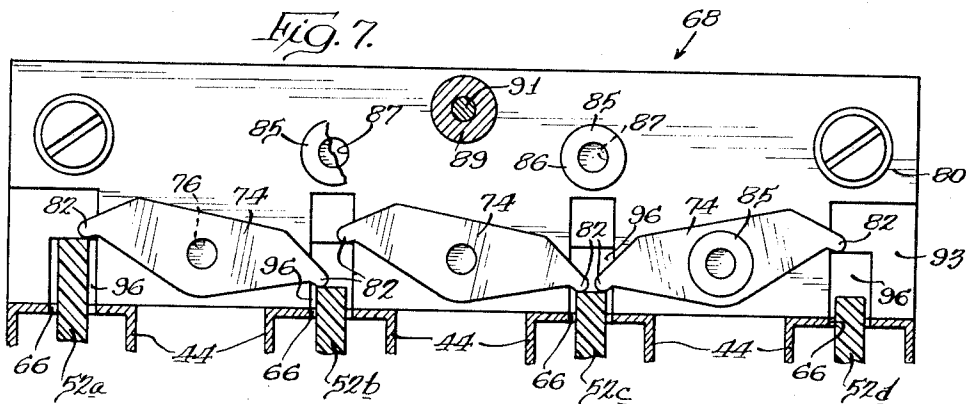
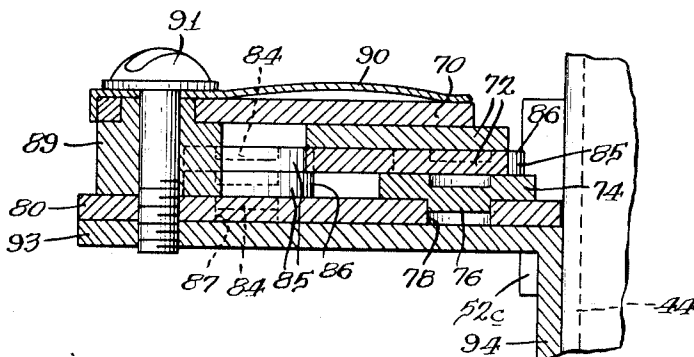


Fig. 8.

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INTERLOCKING CONTROL TABLETS FOR USE IN AN ORGAN

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3 Claims. (Cl. 200—5)

The present invention relates, in general, to a control tablet arrangement for use in an organ, and more particularly to a novel and economical arrangement of linkages and switch elements operated by any one of a group of control tablets to provide a particular musical function in an organ to the exclusion of certain others.

The control or commonly called stop tablets in an organ are provided in order to enable the player to introduce certain musical characteristics such as those introduced by the upper drawbars of an organ into the tones selected on operation of the playing keys. Such characteristics include in addition a trumpet characteristic, clarinet characteristic and full organ characteristic, for example, and each is preferably provided to the exclusion of the others. In order to provide the desired characteristics, the organ is equipped with a series of tablets, properly labeled in accordance with the desired function, and each must be capable of controlling an appropriate number of switches and also resetting any other already operated tablet in the group to interrupt any electrical circuit completed by the already operated tablet.

The above noted factors present difficulties in devising suitable economical, reliable switches and linkages for the tablets, and in addition, since these must be provided in a rather limited space, a substantial problem is presented.

It is therefore an object of the present invention to provide an improved linkage arrangement for a plurality of organ control tablets whereby any tablet in the plurality may be operated and reset any other operated tablet.

It is another object of the present invention to provide an improved arrangement for a plurality of organ control tablets whereby a single operating plunger for each tablet is used for operating switches associated with the tablet and for resetting any other operated tablet.

It is a further object of the present invention to provide an improved type of switch arrangement for each of a plurality of organ control tablets.

Briefly, the objects of the present invention are accomplished by the provision of a group of control tablets all mounted for rotational movement about a common pin and each having a plunger which is positioned by the movement for both operating the linkage and one or more switches operatively associated with the arm. The linkage comprises a rocker arm operatively associated with successive plungers whereby one plunger may reset the successive plunger or be reset thereby, and additional rocker arms operatively associated with alternate plungers and other plungers respectively whereby these may also be reset responsive to the movement of any plunger.

The above and other objects of the invention will become apparent on examination of the following specification and claims together with the drawings, wherein:

FIG. 1 is a side elevational view of the control tablet assembly;

FIG. 2 is a top elevational view of the control tablet assembly;

FIG. 3 is a sectional view taken along the line 3—3 in FIG. 1 illustrating one plunger in its unoperated position;

FIG. 4 is a sectional view similar to FIG. 3 illustrating the plunger of FIG. 3 in its operated position for closing an associated switch;

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FIG. 5 is a sectional view taken along the line 5—5 in FIG. 3;

FIG. 6 is a view illustrating the rocker arm assembly with the top rocker arm removed;

FIG. 7 illustrates the rocker arm assembly with the intermediate rocker arms removed; and

FIG. 8 is a sectional view taken along the line 8—8 in FIG. 6.

In FIGS. 1 and 2 of the drawings, the control tablet assembly is illustrated by the reference character 10. It comprises a series of tablets 12, 14, 16, and 18 marked "Upper Drawbars," "Trumpet," "Clarinet," and "Full Organ" respectively. These tablets 12—18 are each pivotally supported in spaced apart positions on a common pin 20 by an arcuate body element 21. The pin 20 in turn is extended through the top portion of a pair of flanges 22 formed by a U-shaped channel member 23 provided for each tablet. The U-shaped channel members 23 in turn are fastened to one leg 24 of an L-shaped base 25 which is mounted on the organ console (not shown). The base 25 is hidden from view when the organ is assembled while the tablets 12—18 protrude from the console so as to permit facile access thereto as is well understood.

A pair of spaced apart rectangular insulating cards 26, preferably of phenolic, are provided for each tablet. The rectangular cards 26 each have an upper and lower leg 28 and 30 respectively and end legs 32 with a central opening 34 defined thereby. One end leg 32 of each card in a pair is fastened in a spaced apart position from a corresponding leg on the other card between the flanges 22 of each U-shaped channel member 23 by means of screws 36, nuts 38 and spacers 40. The other end leg 32 of each pair is similarly fastened in a correspondingly spaced apart position from the corresponding leg of the associated card between legs 42 of another U-shaped channel member 44. It will be appreciated that if desired rivets or other fastening means may be used to secure the cards to the channel members.

The upper and lower legs 28 and 30 of each card 26 are perforated at spaced apart positions to permit one or more downwardly projecting spring blades 46 to be riveted to respective ones of the upper legs 28 and upwardly projecting spring blades 48 to be riveted to respective lower legs 30. The blades 46 and 48 are each provided with terminals 49 whereby electrical connections may be established thereto and each downwardly projecting blade is longitudinally aligned with a respective upwardly projecting blade 48 on the same card as best seen in FIGS. 3—5.

The upwardly projecting blades 48 are fastened to the inner sides of the cards 26 while the blades 46 are located on the outer sides of the cards to prevent contact therebetween. Each blade 48 is provided with a bifurcated free end having contact portions for engagement with a respective blade 46 and a conical detent portion 50 intermediate its ends. The portion 50 projects into the space between the respective cards 26. Aligned with the detent portions 50 and traversing the distance between the end legs 32 of each pair of cards 26 is a respective plunger 52a—52d.

The plungers 52a—52d are each provided with a series of spaced apart recesses 54 on opposite sides thereof, and a detent portion 50 of one spring blade is adapted to be engaged in a respective one of the recesses. Each plunger has slots 56 adjacent opposite ends thereof, and a pin 58 extending through each of the slots and supported between the end legs 32 of a respective pair of cards enables the plunger arm to be appropriately supported while permitting longitudinally limited movement. One upwardly projecting spring blade 59 located adjacent one end leg 32 is provided for each plunger to bias

the plunger and it has a cup-shaped detent portion 60 for engaging the respective plunger.

Each plunger is also provided with a recess 62 in its upper surface adjacent one end located between the flanges 22, and this recess is engaged by a downwardly extending tab 64 on a respective one of the body portions 21, whereby rotation of the respective tablet 12-18 about the pin 20 is translated into longitudinal movement of the respective plunger 52a-52d and longitudinal movement of each plunger on the other hand is translated into rotational movement of the respective tablet. The other end of each plunger extends through a respective recess 66 in the back wall of the respective U-shaped channel member 44 for engagement with a rocker arm or linkage assembly 68 best seen in FIGS. 6-8.

The rocker arm assembly 68 comprises a top rocker arm 70 overlying a pair of rocker arms 72 which in turn overlie a plurality of rocker arms 74. Rocker arms 74 are each provided with a boss 76 which engages an aperture 78 in a horizontal buffer plate 80. The apertures 78 are located between successive ones of the plungers 52a-52d, and each rocker arm 74 is provided with a cam portion 82 adapted to be engaged by the respective end of the plungers located on either side of its pivot boss 76.

The rocker arms 72 are each provided with a respective boss 84, and these are pivotally received in a cup-shaped pin 85 having a flange 86. The cup-shaped pins 85 are received in respective apertures 87 in plate 80 so that the arms 72 are spaced above the rocker arms 74. The apertures 87 are aligned with respective center plungers 52b and 52c. The rocker arms 72 are each provided with cam portions 88 adjacent their ends, and since these are adapted to engage alternate plungers, such as 56b and 56d, each of the rocker arms 72 must be located in a respective plane. Therefore, two cup-shaped pins 85 are provided for pivotally supporting one of the arms 72 above plate 80 and above the other arm 72.

The upper rocker arm 70 is pivotally mounted along the central axis of plate 80 and is spaced above the other rocker arms by a simple spacer member 89. A spring tension member 90 is mounted above arm 70 and a threaded member 91 inserted through spring 90, arm 70 and spacer 89 to engage the plate 80 for preventing displacement of the rocker arms while permitting free rotation. The rocker arm 70 is provided with cam portions 92 adapted to engage respective end plungers 52a and 52d. It will be noted that the tension member 90 for placing pressure on the rocker arms and preventing their displacement may be replaced by a pair of arms 90' indicated by the broken lines in FIG. 2. These are mounted on plate 80 and spaced thereabove for overlying arm 70 and applying pressure thereto to prevent displacement.

The plate 80 is fastened to an L-shaped plate 93 having a vertical leg 94 which permits the assembly 68 to be mounted on the back wall of the channel members 44. Suitable recesses 96 are provided in the plate 93 and in plate 80 to permit the respective plunger arms to freely engage the respective cam portions. Likewise, rocker arms 70 and 72 are provided with recesses 98 and 100 respectively for allowing plungers 56b and 56c to move without disturbing the position of the rocker arms whose recesses are aligned therewith.

The operation of the assembly, although believed clear from the preceding description, will now be amplified. Thus tablet 12, on operation, is pivoted downwardly about pin 20 to cause its tab 64 to move the associated plunger 52a forward. As the plunger moves forward, the detent portions 50 of any associated blade 48 are disengaged from the respective recess 54, and the contact portion on the blade 48 is biased into engagement with the respective downwardly projecting blade 46 to complete an appropriate electrical circuit. The tension of the associated spring blade serves to hold the plunger in its operated position. The end of the plunger arm engages

the cam portion 82 on one rocker arm 74 and pivots that rocker arm. It also engages the cam portion 88 on a respective one of arms 72 and the cam portion 92 on arm 70 to pivot rocker arms 72 and 70.

Rocker arm 74 on pivoting engages plunger 52b and moves that plunger back if it were in its operated position. On the other hand, if either plunger 52c or 52d were operated, it would be returned to normal under the pressure of arms 72 or 70 respectively. The plunger, on returning to normal, aligns its respective recesses 54 with the detent portions 50 on the respective spring blades to thereby permit the blades to disengage and interrupt any circuit previously completed thereby.

It will be noted that operation of any of the other plungers 52b-52d is basically similar with the exception that the plungers 52b and 52c each operate two rocker arms 74 to return any operated plungers on either side thereof to normal and that plunger 52b operates one arm 72 to return plunger 52d to normal while plunger 52c operates the other arm 72 to return plunger 52a to normal.

Thus, having described one embodiment of my invention, but believing the inventive concept capable of numerous modifications, there is appended hereto a series of claims believed to incorporate the limitations of the invention.

I claim:

1. An organ multiple switching system comprising, a frame, a plurality of thin flat insulating cards secured in said frame in parallel relation and spaced in pairs to provide spaces of uniform thickness between the cards of said pairs, a plurality of flat slides arranged with one of said slides between each of said pairs, said pairs of cards preventing sidewise movement of said slides, means for guiding said slides for longitudinal movement between a retracted position and an advanced position, said slides being formed to provide a plurality of uniformly linearly spaced depressions along the sides thereof with ribs being formed between said depressions, the distance from the center of one of said depressions to the center of an adjacent rib being of the order of the distance between said retracted and said advanced positions, a plurality of contact sets mounted on said cards and extending across said slides, said contact sets having actuators engaging said slides and adapted to close or open the contacts in a particular set depending upon whether the actuator of said set engages a rib or enters a depression on its slide, said cards having openings therethrough to expose the sides of said slides to said actuators, pivoted rocker means interconnecting the ends of said slides and adapted when one of said slides is advanced to retract all of the other slides, and means for individually retracting or advancing selected ones of said slides.

2. The combination called for in claim 1 including, means providing a spring loaded detent secured to one of the cards of each of said pairs and located to enter one of the recesses of its slide in the retracted position of the slide to apply a resilient restraint against movement of its slide away from its retracted position.

3. The combination called for in claim 1 in which the pivoted rocker means comprises a plurality of rockers and a plurality of pivots for said rockers, one of which rockers is longer than any of the others, said longer rocker overlying all of the other rockers and their pivots so that said longer rocker prevents the other rockers from being displaced off their respective pivots.

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