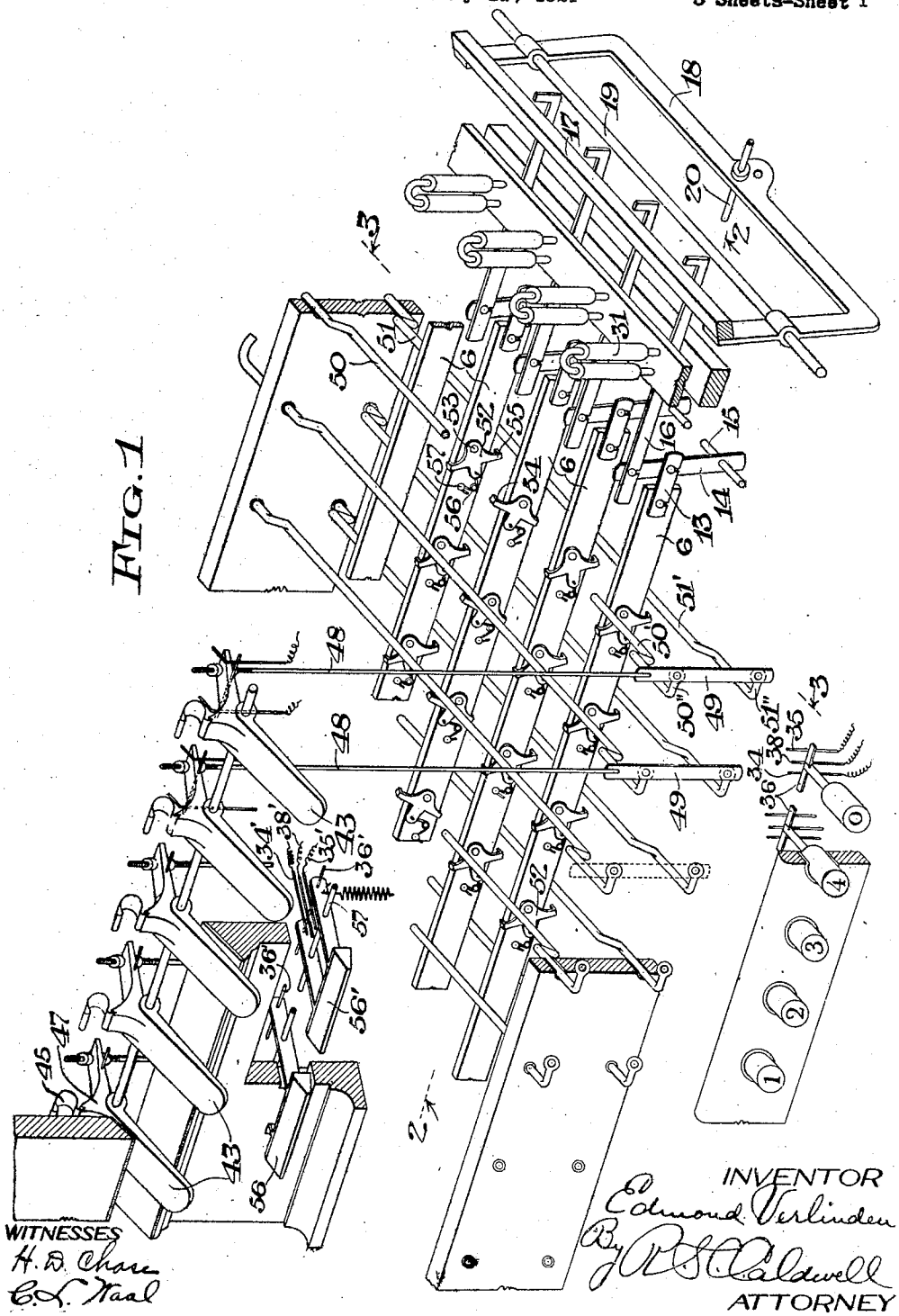
July 17, 1923. 1,462,429

E. VERLINDEN

ADJUSTABLE COMBINATION STOP ACTION FOR ORGANS

Filed May 11, 1921 3 Sheets-Sheet 1

FIG. 1



WITNESSES
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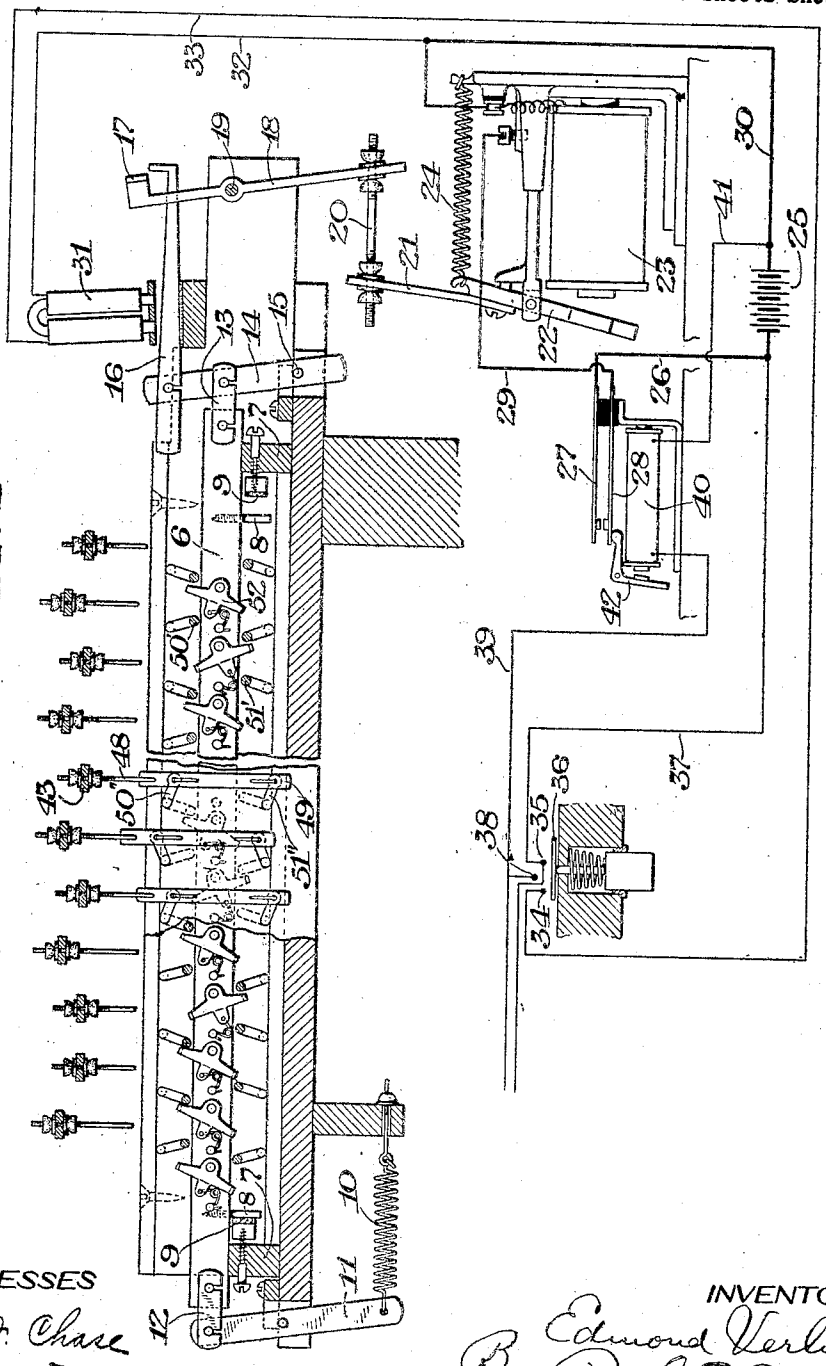
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Filed May 11, 1921 3 Sheets-Sheet 2

FIG. 2



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FIG. 3

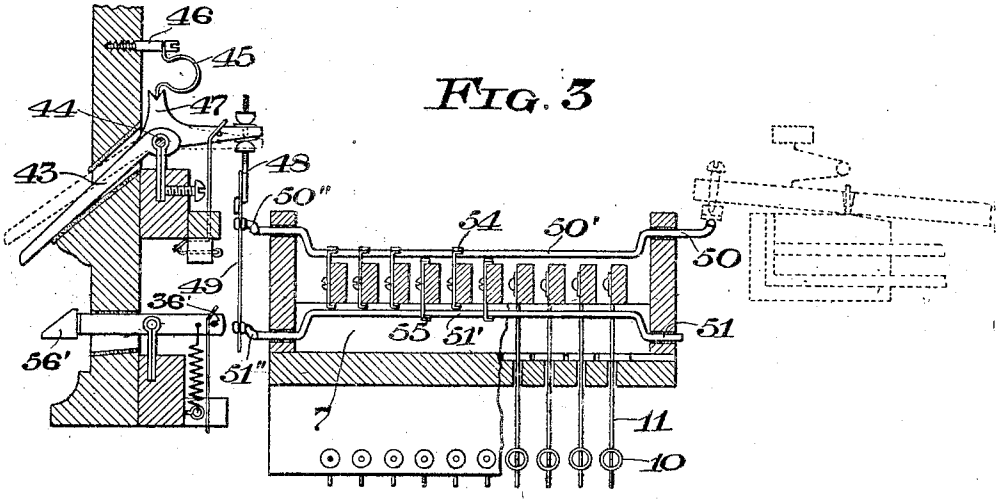


FIG. 4

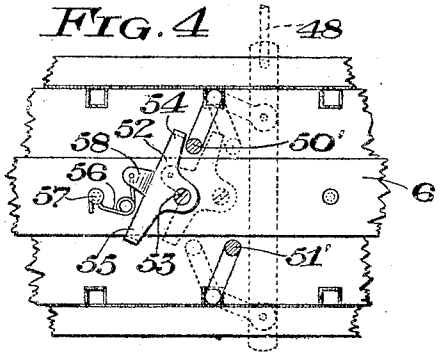
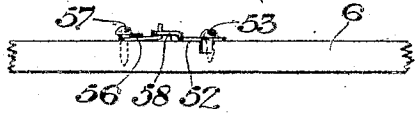


FIG. 5



WITNESSES

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1,462,429

UNITED STATES PATENT OFFICE.

EDMOND VERLINDEN, OF MILWAUKEE, WISCONSIN.

ADJUSTABLE COMBINATION STOP ACTION FOR ORGANS.

Application filed May 11, 1921. Serial No. 468,463.

To all whom it may concern:

Be it known that I, EDMOND VERLINDEN, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Adjustable Combination Stop Actions for Organs, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

The invention relates to stop actions for organs.

It is the object of this invention to provide a mechanism for simultaneously moving a predetermined arrangement of organ stops to either operative or inoperative position, and also to permit independent movement of any organ stop within or outside the desired group without changing the group arrangement.

Other objects and advantages secured by the invention will be apparent to those skilled in this art from the following description taken in connection with the accompanying drawings wherein:

Fig. 1 is a perspective view of a stop-action embodying the invention; Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1 and including trace bar actuating mechanism; Fig. 3 is a detail sectional view taken on the line 3—3 of Fig. 1; Fig. 4 is a detail view of the stop setting mechanism; Fig. 5 is a detail plan view of a portion of a trace rod.

In the drawings the numeral 6 refers to trace rods slidably mounted on transversely extending supports 7 and carrying stop pins 8 engageable with adjustable stops 9. Each trace rod is moved to its normal position by means of a spring 10 connected to the rod by a lever 11 and link 12.

As is well understood in this art, the trace rods may be moved to a setting position either pneumatically or electrically. In the present instance I have shown an electrical system for moving the trace rods. In this system each rod is connected by a link 13 to a lever 14 pivoted on a shaft 15 and carrying a hook 16 pivoted on said lever. All of the hooks 16 are adapted to engage with a bar 17 carried by a lever 18 pivotally mounted intermediate its ends upon a shaft 19. The lower end of this lever 18 is connected by a link 20 with an extension 21 of the armature 22 of an electromagnet 23. The armature 22 is held in "off" position by a spring 24. The magnet 23 is connected in circuit with one side of the battery 25 through a conductor 26, switch contacts 27 and 28 and conductor 29 and the other side of the battery by a conductor 30. The closing of the switch formed by the contacts 27 and 28 serves to energize the magnet 23, causing it to attract its armature 22 and produce a movement of the lever 18 and with it the movement of any one of the trace rods whose hook 16 is in a position to be engaged by the bar 17. The movement of each hook 16 to a position to be engaged by the bar 17 is produced by an electromagnet 31 connected in circuit with one side of the battery by a conductor 32 in circuit with the conductor 30 and connected in circuit with the other side of the battery by a conductor 33, contacts 34 and 35 adapted to be bridged by a switch member 36 and a conductor 37 connected to the conductor 26. A contact 38 is connected to a conductor 39 in circuit with a relay electromagnet 40 which is connected by a conductor 41 to the conductor 30. An armature 42 is normally held in its "off" position by the spring contact 28, but when the circuit is closed through the magnet 40 by bridging any one of the sets of the contacts 35 and 38 the armature is attracted and the contact 28 is moved by said armature into contact with the contact 27. There are as many sets of contacts 34, 35 and 38 and bridging contacts 36 as there are trace rods for forming combinations as hereinafter described, the contacts 35 being in circuit with a common conductor 37 and the contacts 38 being in circuit with a common conductor 39. The contacts 34 have separate conductors 33 leading to the magnets 31. Each bridging contact 36 is here shown forming part of a push button switch, the buttons for the different trace rods being shown in Fig. 1 and designated 1, 2, 3, 4 and 0. In this construction when one of the push buttons is pressed in the bridging piece carried thereby first bridges the contacts 34 and 35 and thereafter the contacts 35 and 38. When the contacts 34 and 35 are bridged the magnet 31 for one of the trace rods controlled by this button is energized and the hook 16 is raised to a position to be operatively engaged by the bar 17 which is subsequently moved when the magnet 23 is energized on the engagement of contact 28 with contact 27 effected by the energization of the mag-

net 40 when the contacts 35 and 38 are bridged. It will therefore be apparent that while the bar 17 is moved when any one of the push buttons is actuated, selective actuation of the trace bars is accomplished by the use of the magnets 31 and the hooks 16.

The stop keys 43 are mounted on a shaft 44 and are adapted to be held in either "off" or "on." position by a looped spring 45 interposed between a screw 46 on the frame of the organ and an arm 47 on the key. Each stop key forms a lever pivotally supported intermediate its ends and the rear end of each lever has a rod or link 48 connected thereto for vertical movement by the swinging of the stop key. This rod 48 connects with a link 49. The link 49 operatively connects a pair of transversely extending setter rods 50 and 51, respectively, positioned above and below the trace rods.

The setter rods are each journalled at one end in the organ frame and have yoke portions 50′ and 51′ and cranks 50″ and 51″, respectively. The yoke portion 50′ of the rod 50 extends downwardly to a position a short distance above the tops of the trace rods and the yoke portion 51′ of the rod 51 extends upwardly to a position a short distance below the bottoms of the trace rods. The cranks 50″ and 51″ are connected to the link 49 and the movement of this link swings the yoke portion 50′ of the rod 50 in an arc above the trace rods in a direction opposite to that in which it swings the yoke portion 51′ in an arc below the trace rods.

These setter rods 50 and 51 are adapted to cooperate with triggers 52 on the trace rods. Each trigger 52 is pivotally mounted intermediate its ends upon a pivot 53 on one of the trace rods and has fingers 54 and 55 offset from the pivot point and adapted to alternately project beyond the trace rod. A spring 56 is pivotally mounted at one end on a pin 57 in line with the pivot 53 and pivotally connected at its other end to an arm 58 on the trigger. The spring 56 acts to hold the trigger in either of two positions, that is when the arm 58 moves past the line of centers between the pivot 53 and pin 57 the spring exerts a pressure on the trigger to swing and hold either the finger 54 projected above the trace rod or the finger 55 projected below the trace rod. The fingers 54 and 55 have inwardly extending projections 54′ and 55′ which act as stops engageable with the trace rod to limit the swinging movement of the trigger.

When the trigger 52 is in its "on" position as shown in Fig. 4 where the end of finger 54 projects above the trace rod, it is in a position to engage with or be engaged by the yoke portion 50′ of the upper setter rod 50. When the trigger 52 is in its "off" position, where the end of finger 55 projects below the trace rod, it is in a position to engage with or be engaged by the yoke portions 51′ of the lower setter rod, some of the triggers being shown in this position in Fig. 2.

The triggers on any trace rod may be set in their "on" or "off" position when such trace rod is moved from its normal position to its "setting" position. As previously pointed out, a spring 10 holds each trace rod in normal position and the rod is moved to a "setting" or "on" position by pressing the push button which controls the hook 16 of this rod so that the magnet 23 and the linkage connected therewith may move this rod against the action of the spring 10. Assuming that the "off" position of the stop keys is the dotted line position shown in Fig. 3, then when any one of the trace rods is moved to a "setting" position, that combination of stops which it is desired to have come "on" simultaneously during the playing of the selection is effected by the operator pressing down on the desired stops, moving them to the full line or "on" position shown in Fig. 3. When any one of the stop keys is thus moved down those triggers on the trace rods in their setting positions which are "off" are moved to "on" because the downward movement of any one stop key causes the rod 51 associated with this key to move the trigger 52 from its "off" to its "on" position. Similarly the upward movement of any one of the stop keys causes the rod 50 associated with this key to move the trigger 52 from its "on" to its "off" position. Thus the operator sets the triggers so that during the playing when he moves the trace rod to its "on" position those triggers 52 which have been set for "on" will engage the rods 50 and cause said rods to swing and through the links 48 and 49 brings on the desired stop keys and those triggers 52 set for "off" will engage the rods 51 and through the mechanism above described move the desired stop keys to "off" while the push button controlling this trace rod is pushed in. Furthermore, when the push button has been pressed in, bringing "on" a previously set combination of stop keys, if the player desires to temporarily bring "on" one or more additional stop keys, or release one or more of the stop keys from operative to "off" position, this may be done manually by the player without effecting the previously set combination, allowing it to be brought "on" in its original arrangement when its controlling button is again pressed in, since the movement of any one of the stop keys when the trace rod is not in a "set" or "on" position does not effect the position of the triggers on this rod. When a combination of stop keys controlled by any other push button is to be effected the pressing in of such button will eliminate from or add to the previously operative combination of stop keys accord-

ing to the selection set, and by the use of a plurality of triggers and a plurality of trace rods a great number of combinations or arrangements of the stop keys may be produced. One of the trace rods, as for instance that controlled by the button "0," may have its triggers set so as to cancel or bring all the stop keys to "off" position after any combination of stop keys has been put "on," as will be readily understood by those skilled in this art.

The stop keys are originally arranged in groups, and in Figure 1 I have shown the mechanism in one of such groups for bringing all the stop keys of such group to "on" or to "off" position. This is accomplished by providing bars 56′ and 56″ with arms mounted for rocking on a shaft 57′ having a switch member 36′ which in each instance is adapted to cooperate with contacts 35′, 34′ and 38′, one set of said contacts being shown in connection with the bar 56″. Either one of these bars 56′ or 56″ with the switch member 36′ provides, when depressed downward, the same operative contact for operating a trace rod as in the manner previously described in connection with the contacts 36, 35, 34 and 38; by the use of these bars the trace rod which the bar 56′ controls may have all the triggers set to "off" position and the trace rod which the bar 56″ controls may have all the triggers set to "on" position whereby the depression of the bar 56′ will act to move any of the stop keys in the group which are "on" to "off" position and the bar 56″ move any of the stop keys in such group which are not "on" to an "on" position.

I desire it to be understood that this invention is not to be limited to any specific form or arrangement of parts except in so far as such limitations are specified in the claims.

What I claim as my invention is:

1. In an adjustable combination stop-action for organs, the combination of a trace rod, a series of stop keys, a pair of setter rods extending transversely of the trace rod and above and below the same and provided with cranks, a link connecting said cranks to move said rods in opposite directions, a connection between the link and a stop key whereby the stop key will operate said rods or be operated thereby at will, and means on said trace rod adapted to cooperate with said setter rods to operate said rods and keys on the movement of the trace rod or to be set by said setter rods on the movement of the keys.

2. In an adjustable combination stop-action for organs, the combination of a trace rod, a series of stop keys, a pair of swinging setter rods extending transversely of the trace rod and above and below the same and provided with cranks, a link connecting said cranks to move said rods in opposite directions, a connection between the link and a stop key whereby the key will operate said rods or be operated thereby at will, triggers carried by said trace rod and movable to "off" or "on" position by the movement of the setter rods and adapted when "on" to engage the setter rods and thereby operate the keys on the movement of the trace rod, and springs for holding said triggers in either "on" or "off" position.

3. In an adjustable combination stop-action for organs, the combination of a trace rod, a trigger pivotally mounted on said rod, a spring for holding said trigger in either "on" or "off" position, means distinct from said spring for limiting the swinging movement of said trigger, a stop key, and means operatively connected to said stop key to operate upon or be operated by said trigger.

4. In an adjustable combination stop-action for organs, the combination of a trace rod, a trigger pivotally mounted on said rod, a spring for holding said trigger in either "on" or "off" position, said trigger having stop projections engageable with the trace rod to limit its swinging movement, a stop key, and means operatively connected to said stop key to operate upon or be operated by said trigger.

In testimony whereof, I affix my signature.

EDMOND VERLINDEN.