

Aug. 23, 1927.

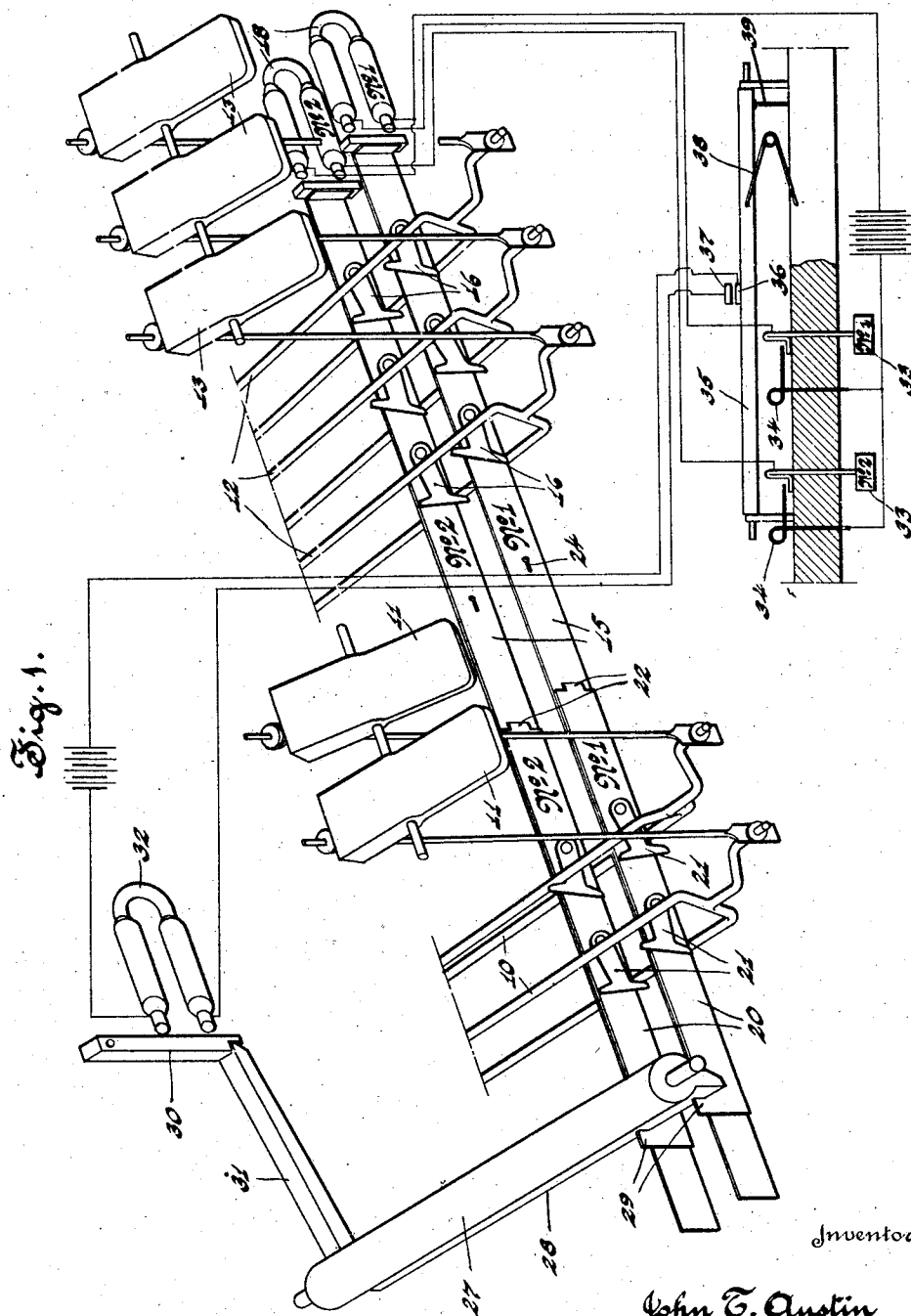
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ORGAN STOP ACTION

Filed Feb. 3, 1925

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Fig. 2.

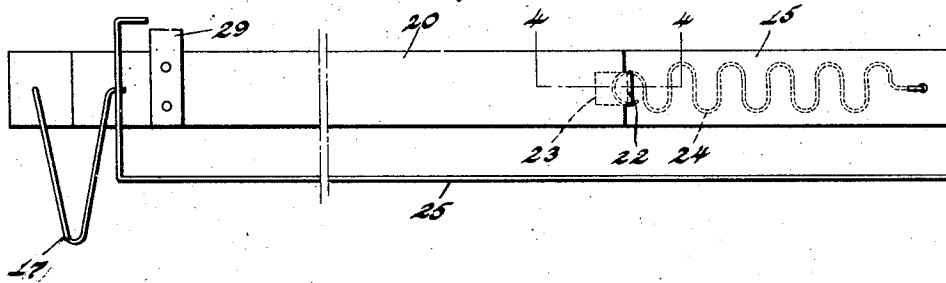


Fig. 3.

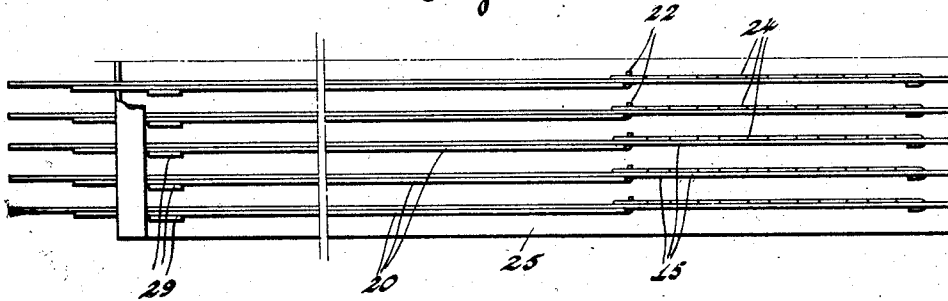
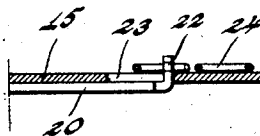


Fig. 4.



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ORGAN STOP ACTION.

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This invention relates to organ stop actions, and has particular reference to means for preparing a number of combinations of stops in readiness for use in the order which
5 may be required as the playing of a musical composition proceeds.

An aim of the invention is to provide an improved construction, organization and arrangement wherein a more flexible and convenient control of the combinations and sub-combinations of the couplers and stops may be had.

A further object is to provide an improved arrangement which is characterized by its
15 simplicity and economy in construction, its effectiveness in operation, and its compactness.

In the illustrative embodiment of the invention herein disclosed, the several stop
20 actions are provided with skeleton rollers which are operated or oscillated by means of traces in a manner generally similar to that disclosed in my Patents Nos. 1,131,814 and 1,145,867. In accordance with the present invention, more than one, in the present
25 instance two, trace is under the control of a single manipulative device or piston, the specific arrangement being such that when the manipulative device is moved to one position, one of the traces associated therewith is moved, and when the device is moved to a
30 second position, the other trace is moved. To effect economy in space and cost of construction, the traces under the control of each manipulative device are mounted on one
35 another.

Other objects will be in part obvious and in part pointed out more in detail herein-after.

40 The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction herein-after set forth, and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings, I have shown, more or less diagrammatically, one embodiment which the present invention
50 may take, but it is to be understood that this disclosure is by way of exemplification only, as my invention is susceptible of various modifications and changes. For example, in the drawings, I have shown an electrical

control, but it is obvious that various actions 55 and elements may be operated pneumatically, electrically or mechanically, either in part or in whole. Various other arrangements may be adopted.

In said drawings:

Figure 1 is a perspective view of so much of the structure as is necessary to illustrate one application of my invention;

Fig. 2 is a side elevation of a pair of associated trace bars, the abutments or cams
65 being omitted;

Fig. 3 is a plan view showing a plurality of traces; and

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2.

Referring to the drawings in detail, 10 designates the skeleton rollers of one set of stop actions, and 11 are the tablets for individually oscillating these rollers. The numeral 12 designates the rollers of another
75 set of stop actions adapted to be individually manipulated in suitable manner, as by tablets 13. The connections between the rollers and the several registers of pipes is not illustrated, as these may be of any suitable
80 or well-known type. For convenience in description, it may be assumed that the set of stop actions having the rollers 10 is associated with the pedal organ, and the other set of stop actions having the rollers 12 is
85 associated with an organ played from a manual, for example the great organ. In actual practice, other sets of stops respectively associated with the choir organ, the swell organ, or other section may be provided.
90 The stop action operating devices or rollers 12 are actuated in various selected combinations by traces 15 which, for conciseness in terminology, are herein called the primary traces. These traces have the usual cams or
95 abutments 16 for selectively turning the rollers in one direction or the other. The traces are individually operated or moved in one direction by respective magnets 18, and in the opposite direction by means of respective
100 springs 17.

Mounted on the primary traces 15, and having movement relative thereto, are other traces 20 which, for convenience, are termed secondary or follower traces. These second-
105 ary traces have cams 21 adapted to actuate the rollers 10. Preferably, but not necessarily, all of the traces are formed of thin

strips of metal, and each secondary trace is positioned along one side of its associated primary trace. The secondary traces are relatively shorter than the primary ones, as shown in the drawings. Each secondary trace is so connected to its associated primary one that, when the latter has been moved to operative position and the secondary trace is released, the secondary trace will move to operative position. To this purpose, the forward end of each secondary trace is shown as having an ear 22 extending through a slot 23 in the associated primary trace, and a spring 24, connected at its respective ends to the primary trace and ear, is employed for normally urging the secondary trace forwardly with respect to the primary trace on which it is mounted. It will be seen, by referring to Fig. 4, that, when the secondary trace is in normal position, the ear 22 abuts against the forward face of the opening 23. As the primary trace 15 is moved forwardly by a suitable manipulative device, the secondary trace 20 is retained in its normal position by a latching mechanism, hereinafter described more in detail, thereby increasing the tension of the spring 24 and bringing the rear face of the slot 23 adjacent the ear 22 of the secondary trace 20. When the above-mentioned latching device is released, the secondary trace is moved forwardly by virtue of the tension of the spring 24, the extent of movement of the secondary trace 20 being restricted by the slot 23. When the manipulative device, which controls both traces, is released, the traces are returned to normal position in unison by the spring 17. The numeral 25 indicates a support on which the traces are mounted for sliding movement.

Means common to all of the secondary traces is provided for holding or latching these traces in inoperative or "off" positions. This means may take any suitable form, but is here shown as including a roller or cam 27 having a ledge 28 adapted to engage upstanding projections 29 on the rear ends of the secondary traces. The roller 27 is normally held in operative or holding position by a latch 30 cooperating with an arm 31 fixed to and extending from the roller. The latch 30 may be controlled or operated by a magnet 32.

The manipulative devices through which the traces are controlled are designated by the numeral 33. They are here shown, for illustrative purposes, as being in the form of pistons or push rods. These devices are respectively associated or connected with the operating magnets 18, and all of them may be effective to result in actuation of the roller 27 and the resultant release of the secondary traces. In the present instance, the respective pistons 33 and associated contact members 34 are connected by conducting wires

to the operating magnets 18. Mounted behind the pistons for oscillating or swinging movement is a bar 35 having a contact 36 adapted to engage, when the bar is rocked rearwardly, a contact 37, these contacts being in a circuit which includes the magnet 32. The bar 35 is normally held in "off" position, as by means of a spring 38, against an abutment 39. The pistons may be identified as No. 1, No. 2, etc. For convenience, the respective associated magnets 18, primary traces 15, and secondary traces 20 are similarly identified in the drawings.

The operation of the arrangement described is briefly as follows: Assuming that in setting up the traces, so that the various desired combinations of stops will be ready for use in the required sequence during the rendition of the programme or selection, it is desired to set the cams on the primary trace No. 1, the piston No. 1 will be moved in until it engages the contact 34 associated therewith, whereupon the operating magnet No. 1 is energized drawing the trace No. 1 to the right, referring to Fig. 1. The selected tablets 13 will then be manually rocked in a direction to oscillate the rollers 12, in the present instance counterclockwise, whereupon the associated cams 16 on the trace No. 1 are thrown down. If it is desired to also set the cams on the secondary trace No. 1, the piston No. 1 will be moved inwardly to its full extent, thereby rocking the bar 35, with the result that contact is closed between the terminals 36 and 37, causing energization of the magnet 32 and release of the roller 27. When the roller is thus released, the secondary trace No. 1 will, under the influence of its associated spring 24, move forwardly on the primary trace and then the tablets 11 may be selectively rocked to selectively set the cams 21 on the secondary trace No. 1. After the cams have been thus selectively set, the piston No. 1 may be released or drawn out, thereby breaking the circuits through the associated magnets, with the result that the spring 17 associated with the primary trace No. 1 will pull this trace and the associated secondary trace to their inoperative or left hand positions. The roller 27 will also be moved to the latching position shown in Fig. 1 by its own weight. The cams on the other traces may be set in a similar manner in accordance with the arrangement of a composition to be played. Now, assuming that, during the rendition of the composition, it is desired to bring on a certain combination of stops by operating the primary trace No. 1 without operating the secondary trace associated therewith, the piston No. 1 will be moved to its first position where it closes contact with the terminal 34, causing energization of the magnet No. 1, whereupon the primary trace is drawn on and the set cams

thereon will oscillate the respective selected rollers to move on or off the desired register or registers. If it is desired to change the registers of pipes in the pedal organ, the piston No. 1 may be moved to its full extent, resulting in the secondary trace No. 1 moving to the right and throwing the selected rollers 10 in a direction to move on or off the desired registers in the pedal organ. If it is desired to change the registers in both the great organ and the pedal organ at the same time by means of the primary trace No. 1 and the secondary trace No. 1, the piston No. 1 may be moved in to its full extent so that both the primary trace No. 1 and the secondary trace No. 1 are moved practically simultaneously. It is, of course, obvious that various combinations may be had and, if desired, the primary traces may be moved singly and the associated secondary traces subsequently, or a primary trace and a secondary trace may be moved at the same time. The selected stop actions of the pedal organ may be thrown on by one of the secondary traces subsequently to the operation of its complementary primary trace and then, without disturbing the setting of those stop actions, the stop actions of the great organ, or other organs, may be changed by operating other primary traces singly.

From the foregoing description, taken in connection with the accompanying drawings, it will be clear that each of the manipulative devices or pistons is differentially movable and, when moved into one position, a corresponding primary trace is operated, and when moved into a second position, the secondary trace associated with the operated primary one will move on its operative stroke, that is to the right. Preferably, when a piston has been moved to its first position, that is where it engages the associated contact 34, the organist will be apprised of this fact by engagement of the piston with the bar 35, indicating that a slightly greater pressure must be exerted on the piston to rock the bar 35. It will further be seen that, since the secondary traces are mounted upon the primary traces, the secondary traces require practically no additional space, and the structure is very simple and economical. A greater number of different combinations may be had than would be the case if the cams for the pedal organ were carried on the same traces on which the cams for the other organs were mounted, and this greater variety of combinations may be had without increasing the number of manipulative devices.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or

shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. In a musical instrument, a set of stop action operating devices, a trace common thereto, a second set of stop action operating devices, a trace common thereto, and a manipulative device common to said traces and movable to successive positions to effect successive operation of the traces.

2. In a musical instrument, a set of stop action operating devices, a trace associated therewith, a second set of stop action operating devices, a trace associated with said second set, and a manipulative device associated with both of said traces and having two positions of operation in one of which one of said traces is moved and in the other of which the other trace is moved.

3. In a musical instrument, a set of stop action operating devices, a trace associated therewith, an operating magnet for said trace, a second set of stop action operating devices, a trace associated therewith, a controlling magnet for said second trace, and a piston electrically associated with said magnets and movable to successive positions in which the operating magnet and controlling magnet are successively energized.

4. In a musical instrument, a set of stop action operating devices, a plurality of traces associated therewith, a plurality of manipulative devices one for each trace, a second set of stop action operating devices, a plurality of traces associated therewith, and controlling means common to said second mentioned traces, said controlling means being common to all of said manipulative devices.

5. In a musical instrument, a set of stop action operating devices, a plurality of traces associated therewith, a second set of stop action operating devices, traces associated therewith, a plurality of manipulative devices each device being associated with a respective first mentioned trace and a second mentioned trace, and means common to all of the second mentioned traces associated with all of the manipulative devices for releasing the second mentioned trace.

6. In a musical instrument, a set of stop action operating devices, a plurality of traces associated therewith, a second set of stop action operating devices, traces associated therewith, a plurality of manipulative devices each associated with a respective

first mentioned trace and a respective second mentioned trace, and means common to all of the second mentioned traces and normally holding the same against actuation, each of said manipulative devices having two positions of operation in the first of which a respective first mentioned trace is operated and the respective second mentioned trace is selected for operation, each of said manipulative devices in their second position of operation resulting in the release of said holding means and the actuation of the selected second trace.

7. In combination, a first trace and a follower trace, said follower trace having movement relative to the first trace, and a connection between said traces permitting operative movement of the first trace independently of the second one and normally urging the follower trace into operative position when the first trace is operated.

8. In combination, a first trace, a follower trace having limited movement relative to said first trace, and a spring between and connected to said traces and normally urging the second trace into operative position.

9. In combination, a first trace, a second trace located along the side of and carried, at least in part, by said first trace, and a spring between and connected to said traces.

10. In combination, a first trace, a second trace, each made of a thin strip of metal, the traces being positioned side by side and the second trace being carried by said first trace, actuating cams on the first trace, and actuating cams on the second trace.

11. In a musical instrument, a first trace, a second trace having movement relative to the first trace, a connection between said traces permitting operative movement of the first trace independently of the second one and normally urging the second trace into operative position, and a manipulative device having two positions of operation in the first of which said first trace is operated and in the second of which said second trace is permitted to move on its operative stroke.

12. In a musical instrument, a first trace, a follower trace for limited movement relative to said first trace, a spring between said traces and normally urging the second trace into operative position, operating means for said first trace, means normally holding said second trace against operation, and a manipulative device associated with said operating means and holding means and having two successive positions of operation in the first of which said operating means is operated and in the second of which said holding means is released.

13. In a musical instrument, a plurality of primary traces, a plurality of follower

traces respectively associated with and having limited movement relative to said primary traces, means between each primary trace and its associated follower trace normally urging the follower trace into operative position, operating means respectively associated with said primary trace, means common to all of the follower traces for holding the same against actuation, and a plurality of manipulative devices respectively associated with said operating means and commonly associated with said holding means, each of said manipulative devices having two successive positions of operation and arranged to successfully operate its associated operating means and said holding means in sequence.

14. In a musical instrument, a plurality of primary traces, a plurality of follower traces respectively associated with said primary traces, said follower traces being located along the side of the respective primary traces and having limited movement relative thereto, operating means respectively associated with said primary traces for moving the same on their operative strokes, means normally urging each of the primary traces in the opposite direction, a spring between and connected to each primary trace and its associated follower trace, a cam for normally holding said follower traces in inoperative positions, a latch for holding said cam in holding position, controlling means for said latch, and a plurality of pistons respectively associated with said primary trace operating means and commonly associated with said latch controlling means, each of said pistons having two successive positions of operation in the first of which the respective trace operating means is energized and in the second of which said controlling means is energized.

15. In a musical instrument, a plurality of primary traces, operating magnets respectively associated therewith, a plurality of follower traces respectively associated with said primary traces, a spring between and connected to each follower trace and its respective primary trace, means including a controlling magnet for holding said follower traces in inoperative positions, a switch for said controlling magnet and including a movable bar, a plurality of manipulative devices, and a switch individual to each manipulative device and a respective operating magnet, said manipulative devices each having successive positions of operation in the first of which the respective switch associated with the operating magnet is closed and in the second of which said bar is moved to close the switch associated with said controlling magnet.

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