May 7, 1929. P. S. CARLSTED 1,711,989

CHEST ACTION FOR PIPE ORGANS

Original Filed July 21, 1926

Fig. 1.

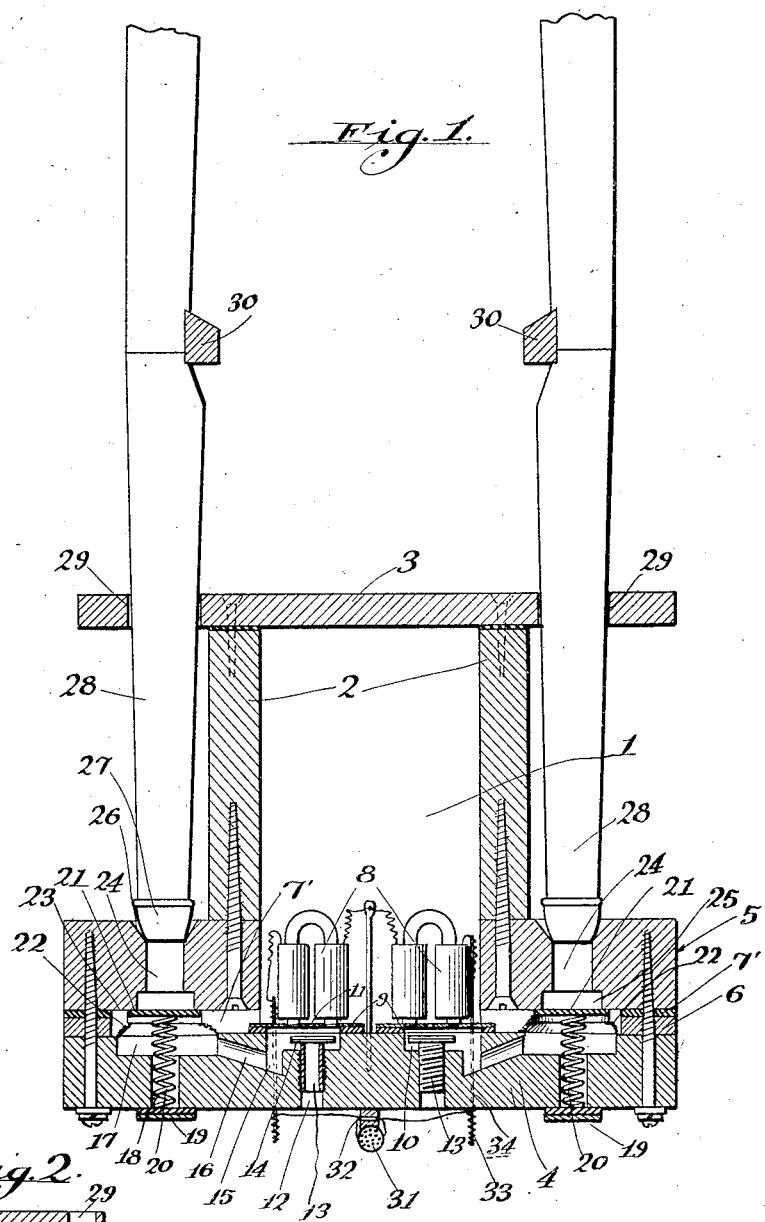
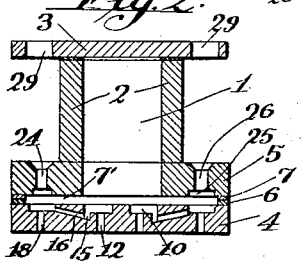


Fig. 2.



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CHEST ACTION FOR PIPE ORGANS.

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My invention is a chest action for pipe organs.

In the construction of pipe organs the chest action for sounding the pipes from the air under pressure in the wind channel utilizes a valve in the base of the channel which is usually electrically operated. This valve allows air to travel through a series of passages in the walls of the chest or wind channel and operate a valve at the top of the wind channel which passes the air to the individual pipes for sounding the different notes. This construction requires considerable boring in the walls of the wind channel, making a relatively expensive construction. In my present invention I simplify the construction so that the amount of boring and cutting in the structure surrounding the wind channel is comparatively little and having a more direct path from the electrically controlled valve to the air operated valve for each of the pipes. Moreover, by my construction I am enabled to house the pipes in a more convenient position in regard to the wind channel.

Another feature of my invention is constructing the air chest or wind channel so that it extends above the top boards which support the pipes, the pipes passing through a rack which forms the top closure of the air chest or wind channel. The pouch board is positioned slightly below the lower edge of the top boards which latter are secured to the sides of the wind channel at their lower edge and the pouch board supports the electro-magnets and has recesses in which the electrically controlled valves are positioned and directly underneath the pipes has air chambers with air valves for controlling the air directly from the wind channel to the pipes, there being a series of bores or other passages for air in the pouch board from the recesses to the air chambers.

My invention will be understood from the accompanying drawings and description, in which;

Figure 1 is a cross section through the wind channel or air chest, showing the relative arrangement of the rack, the pipes, the top board secured to the sides of the wind channel at its lower edge, the pouch board positioned below the top boards and having the various valves mounted therein;

Fig. 2 is a cross section similar to Fig. 1, showing the framing without the valves, pipes and their details.

In this construction the wind channel is designated by the numeral 1 having side walls 2, a rack board 3, a magnet and pouch board 4 and top boards 5. The sides and the rack board are attached together in the ordinary manner. The top boards are secured at their one side to the lower edge of the side walls and the magnet and pouch board are secured to the top boards. Filler pieces 6 and packing strips 7 extend longitudinally along the outside edge of the top and pouch board, forming an air-tight seal.

It will be seen by the construction of Fig. 2 that the wind channel in effect extends laterally underneath the top board in the space designated by the numeral 7'. Therefore when the air valves are operated for controlling the pipes as hereunder described there is a direct passage from the wind channel underneath the top boards to the pipes.

The construction of the electrically controlled valves is substantially as follows:

The electro-magnets 8 are supported in any suitable manner, there being a covering or disc 9 over the recess 10 formed in the pouch board, the cover having an air opening 11 therethrough leading to the recess. A bore 12 extending downwardly through the pouch board has a tubular nipple 13 secured therein on which rests the valve 14, this valve being of a character to be attracted by the electro-magnets and elevated to close the passage 11 or in its normal position forming a closure for the nipple 13.

A short vertical bore 15 extends downwardly from the recess 10, being closed at its upper end by the structure 9. An angular bore 16 connects thereto leading into an air chamber 17 formed at the side of the pouch board. A socket 18 preferably extends through the pouch board from the chamber 17 and is closed at the lower end by discs 19 of leather or the like. A spring 20 is positioned in the socket 18 bearing on the closure discs 19 and supports a diaphragm valve 21 attached to a diaphragm 22, this latter being connected to the upper surface of the pouch board and forming a closure for the air chamber 17. This valve is seated on the lower surface 23 of the top board.

These top boards are provided with air passages 24 preferably having enlargements 25 at their lower ends and at their upper ends have bevelled openings 26 connecting to the mouths 27 of the organ pipes 28. These pipes

extend upwardly through openings 29 in the rack boards and are braced by longitudinal braces 30.

A conduit 31 for the electric cables is suspended from a longitudinal strip 32 and the lead wires 33 for the electro-magnets extend from these cables upwardly through small bores 34 in the pouch board and are suitably connected to the electro-magnets.

The manner of operation of my chest action for pipe organs is substantially as follows:

It will be understood that the pipes on opposite sides of the wind channel function in the same manner and that there will be a series of pipes each having their own individual electro-magnet and the various valves and passages for air above described. When the valves 14 in their normal position rest on the nipples 13, the passages 11 from the wind channel 1 are open and air may pass downwardly through these passages into the recess 10 through the vertical and inclined bores 15 and 16 to the air chambers 17, thereby expanding the diaphragms 22 and lifting the valves 21 closing each pipe.

When notes are struck on the organ, individual electro-magnets are energized and any magnet lifts its valve 14 thereby closing the opening 11 from the wind channel. Hence due to the differential air pressure the diaphragms 22 are forced downwardly and the valves 21 opened, the air in the air chamber 17 being expelled to the desired extent through the tubular nipples 13 by passing underneath the valves 14, thus sounding the organ pipes desired.

It will be apparent by the above description that I have simplified the air passages from the electric control valves to the individual pipe valves and also that the pipes are conveniently located on opposite sides of the wind channels.

It is obvious that considerable changes and modifications can be made in my construction in the general features or specific details to adapt this for different types of organs or for different installations. Such changes however, would be within the spirit of my invention as set forth in the description, drawings and claims.

Having described my invention, what I claim is:

1. A pipe organ chest having a wind channel with a flat unitary pouch board forming a closure on one side, a valve positioned in the pouch board, there being a passage in the pouch board from said valve, an organ pipe and a sound valve operable in part of the pouch board connected to said passage, the wind channel being connected to the pipe when the second valve is lowered.

2. A pipe organ chest having a wind channel with a flat unitary pouch board forming a closure on one side, the pouch board having a recess and an air chamber in its upper surface with a passage connecting same, an electrically controlled valve in the recess, a second valve in the air chamber having a diaphragm, a pipe connected to the second valve, there being a passage from the wind channel to the pipe when the second valve is lowered.

3. A pipe organ chest having a wind channel with a flat unitary pouch board forming a closure on one side, there being a recess in the surface of the board adjacent the channel and an air chamber at one side of the board with a passage connecting the chamber and recess, there being a bore extending through the board from the recess, an electrically operated valve positioned over the said bore, a second valve having a diaphragm positioned over the air chamber, and an organ pipe positioned in relation to the second valve whereby air may pass from the wind chamber to said pipe when the second valve is lowered.

4. A pipe organ chest having a wind channel with a flat unitary pouch board forming a lower closure, there being a recess in the pouch board adjacent the wind channel and an air chamber adjacent an edge of the board, with passages connecting the recess and the chamber, a bore extending from the recess through the board, a nipple in the bore, an electrically controlled valve on said nipple in the recess, a second valve in the air chamber having a diaphragm, a spring seated in the pouch board extending through the air chamber against the second valve, a structure having a passage leading from the second valve, a pipe connected thereto, there being a passage for air from the wind channel to the pipe when the second valve is lowered.

5. A pipe organ chest having a wind channel, side walls and an upper wall, a pair of top boards connected to the lower edge of the side walls, a pouch board extending between the two top boards forming a lower closure for the wind channel, there being a series of longitudinal recesses in the pouch board adjacent the wind channel and a series of air chambers in the upper surface of the pouch board adjacent the top boards, passages connecting the recesses and the air chambers, a series of tubular nipples extending from the recesses through the pouch board, electrically controlled valves on the nipples in the recesses, air valves having diaphragms in the air chambers, springs pressing said valves normally upwardly, a series of air passages through the top boards registering with the air chambers, pipes connected to said latter passages, there being a series of passages for air from the wind channel to the said latter passages and pipes when the air valves are in their lowered position.

6. A pipe organ chest having a wind channel with a pouch board forming a closure at the lower side, a recess in said board adjacent the wind channel, an air chamber in the

upper surface of the bore spaced from the wind channel, there being an angular and vertical bore from the air chamber to the recess, a tubular nipple extending from the recess through the bore, an electrically operated valve on the nipple, an air valve having a diaphragm positioned in the air chamber, having a spring seated in the pouch board thrusting said valve upwardly, a pipe connected to the opposite side of the valve, there being an air passage from the wind channel to the pipe when the said air valve is lowered.

7. A pipe organ chest having a wind channel with side walls and a top, a pair of top boards connected to the lower edge of each side wall and having air passages therethrough outside of the side walls, a pouch board connected to the top boards having a series of air chambers in its upper surface in alinement with the passages in the top boards, a series of recesses adjacent the wind channel, there being bores through the pouch board from the air chambers to the recesses and there being a series of bores from the recesses through the board, electrically controlled valves forming a closure for said latter bores, a series of air valves having diaphragms positioned in the air chambers forming closures for the passages through the top boards, pipes connected to the top boards at the said passages, springs bearing on the lower surface of the air valves, there being air passages from the wind channel to the passages through the top boards when the air valves are in their lowered position.

8. A pipe organ chest having an air chest, a top board secured to the lower side of the chest having pipes extending therefrom, a pouch board below the top board and spaced therefrom, the top board having an air passage to the pipe, an air valve in the pouch board forming a closure with the top board at the said passage, and means to operate the said air valve.

9. A pipe organ chest having a wind channel with side walls and a top closure, top boards secured to the lower edge of the side walls and extending laterally outwardly, a pouch board positioned below the top boards and spaced therefrom, the top boards having passages for air connected to the space between the top boards and the pouch board, pipes connected to the top boards at the said passages, air controlled valves positioned in the pouch board to register with the said passages and forming closures against the top boards, and means to operate said air valves.

10. A pipe organ chest as claimed in claim 9, the top closure for the wind channel being formed as a rack supporting the pipes at each side of the wind channel.

11. A pipe organ chest having a wind channel with side walls, a rack board forming a top closure, top boards secured to the lower edge of the side walls and extending laterally, a pouch board positioned below the top boards, the top boards having air passages therethrough, pipes supported in the rack board registering with the said passages, air valves in the pouch board registering with the said passages, and means to operate said air valves.

12. A pipe organ chest having a wind channel with side walls and a top closure, top boards secured to the lower edges of the side walls and extending laterally, a pouch board spaced below and having means to secure same to the top board forming an air-tight closure, pipes connected to the top boards, there being passages through said boards to lateral extensions of the wind channel, air valves in the pouch board, electrically controlled valves in the pouch board and electro-magnets supported by the pouch board, there being passages from the electric valves to the air valves.

13. In a pipe organ, a wind channel having side walls and a top closure, top boards connected to the lower edges of the side walls and extending laterally therefrom, a pouch board positioned below and spaced from the top boards, forming an air-tight closure, the wind channel having a lateral extension underneath the top boards, said top boards having air passages adapted to lead to organ pipes.

14. In an organ, a wind channel having side walls, a top closure forming a rack adapted to support pipes, top boards secured to the lower edges of the side walls, a pouch board positioned below and having means to secure same to the top boards forming an air-tight closure, the wind channel having lateral extensions underneath the top boards, the top boards having air passages therethrough adapted to receive the lower ends of organ pipes.

In testimony whereof I have signed my name to this specification.

PAUL S. CARLSTED.