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2,167,407

MAGNET FOR ORGANS

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Fig. 1.

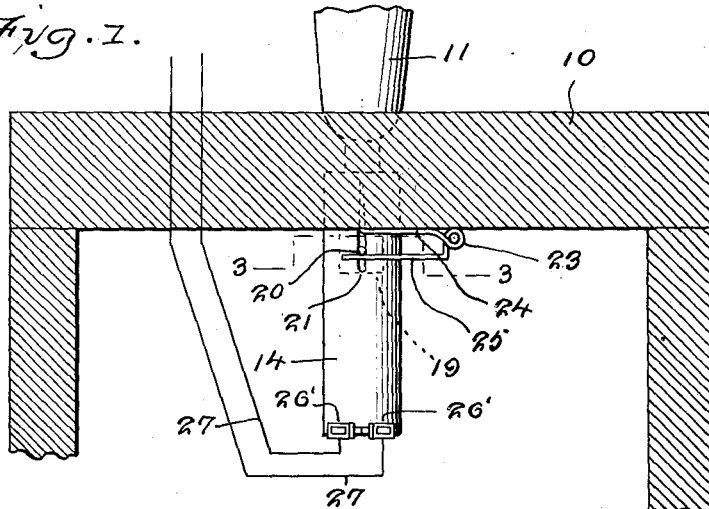


Fig. 2.

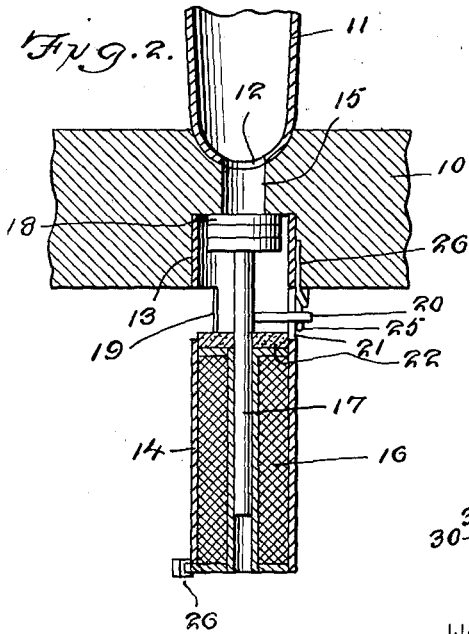


Fig. 3.

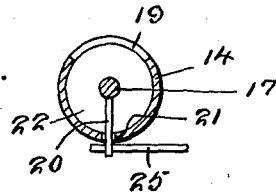
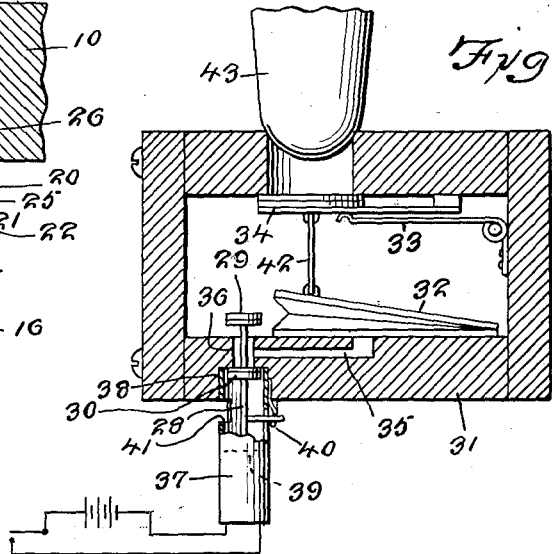


Fig. 4.



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# UNITED STATES PATENT OFFICE

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## MAGNET FOR ORGANS

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5 Claims. (Cl. 84-339)

This invention relates to magnets for organs and has for an object to provide a simplified magnetic valve for use as a pipe valve and for other purposes in organs.

5 A further object is to provide a device of this character which may be easily applied and removed without the use of screws or other connectors and in which a solenoid and valve are housed in a single casing to the end that the  
10 device will be compact and take up little room in the organ mechanism.

A further object is to provide valves of this character which may be readily mounted on a single pine board, forming part of the organ  
15 chest, and which provides a sound board to promote resonance to the sound or vibrations of the pipes, similar to the sounding board of a piano.

With the above and other objects in view the  
20 invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without  
25 departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawing forming part of this specification:

30 Figure 1 is a cross sectional view of a portion of a pipe organ wind chest and pipe and showing applied thereto a magnet valve constructed in accordance with the invention.

Figure 2 is a longitudinal sectional view of the magnet valve shown in Figure 1.

35 Figure 3 is a cross sectional view taken on the line 3-3 of Figure 1.

Figure 4 is a side elevation, with portions broken away, of a modified form of the magnet valve in applied position.

40 Referring now to the drawing in which like characters of reference designate similar parts in the various views, 10 designates a wind chest for holding a series of valve actions adapted to control the flow of air to the pipes 11 of an organ.

45 These pipes are mounted at their lower ends on the wind chest and are provided with ports 12 for conducting air to the pipes.

In one embodiment of the invention a counter-bore 13 is formed in the wind chest to receive  
50 the casing 14 of the magnet valve, the casing being open at the top and communicating with an opening 15 which supplies air from the wind chest to the respective pipe through the port 12.

The casing is preferably in the form of a tube  
55 of insulating material having frictional engage-

ment with the wall of the counterbore 13 so that it may be quickly removed or applied without the use of tools. A solenoid 16 is mounted in the end portion of the tube and is provided with an armature 17 which extends substantially through  
5 the tube when retracted by energizing of the solenoid. An organ valve 18 is mounted on the end of the armature and seats on the end wall of the counterbore to control admission of air to the pipe through the opening 15. The casing 13  
10 is provided with a transversely disposed port 19 through which air enters the casing from the wind chest for admission to the respective pipe 11. The armature is provided with a laterally  
15 extending pin 20 which projects through a longitudinally extending slot 21 formed in the casing. A felt or other cushion 22 is disposed on the end of the solenoid to cushion the pin against shock and limit opening movement of the valve when  
20 the armature is withdrawn due to energizing of the solenoid.

A coil spring 23 is provided with two legs 24 and 25 which extend parallel to each other. The leg 24 is provided with an angularly bent extremity 26 which is wedged into the counterbore  
25 18 between the casing and the wall of the counterbore so that the spring is normally held against dislodgement but may be removed as a unit with the magnet valve when inspection or  
30 repairs is necessary. The free leg 25 of the spring is engaged underneath the pin 20 and normally holds the valve 18 seated. When the solenoid is energized the spring is deformed and stores up energy to quickly close the valve im-  
35 mediately the solenoid becomes de-energized.

The ends of the solenoid coil are carried outside of the casing and connected to terminals 26' to which conductor wires 27 may be secured in the usual manner.

The magnet valve above described and illus-  
40 trated in Figures 1, 2 and 3 is preferably used in connection with small pipes. In the modified form of magnet valve shown in Figure 4 the valve may be used in connection with large pipes as  
45 will now be described.

In the modified form of the invention the parts are the same as previously described with the exception that the armature 28 is equipped with a pair of valves 29 and 30. This modified  
50 form of the invention may be used in connection with a wind chest 31 having a bellows 32 coacting with a spring 33 for holding the valve 34 seated. The bellows is supplied with pressure from the wind chest through a duct 35 which communicates  
55 with a port 36 formed in the bottom wall of the

wind chest and communicating at the top with the interior of the wind chest and communicating at the bottom with the open upper end of the solenoid casing 37, which in this instance, is inserted at the upper end in a counterbore 38 forming a continuation of the port 36.

The lower valve 30 normally seals the bottom of the port 36 while the upper valve 39 is in open position to permit air pressure to enter the bellows from the interior of the wind chest. When the solenoid 39 is energized the armature 28 is retracted against the pressure of the coil spring 40 to open the lower valve and close the upper valve. Thereupon the air pressure in the bellows vents to the atmosphere through the duct 35, port 36, casing 37 and opening 41 in the side of the casing. The excess pressure in the wind chest acting against the atmospheric pressure in the bellows collapses the bellows which through the medium of the conventional link 42 immediately pulls open the valve 34 and supplies the pipe 43 with wind chest pressure. Upon the solenoid becoming deenergized the position of the valves is reversed cutting off communication between the bellows and the atmosphere and establishing communication between the bellows and the interior so that the bellows is extended and closes the valve 34.

It will be pointed out, and the scope of the invention extends to, the feature that these valves are easily mounted on the organ chest. Also that all of the valves may be assembled on a single pine board, such as the top 19 of the chest, which board then provides a sound board that promotes resonance of the sound or vibrations of the pipes of the organ, similar to the sounding board of a piano.

From the above description it is thought that the construction and operation of the invention will be fully understood without further explanation.

What is claimed is:

1. A magnetic valve for organs comprising a casing provided in one side with an opening forming an air port, a solenoid in the casing, an armature for the solenoid, a valve on the armature, said valve and said solenoid being disposed on opposite sides of said opening, there being a slot in said casing, a pin carried by the armature and extending through said slot, and a spring disposed exteriorly of the casing having a pair of legs one of which is adapted to be engaged with said pin and the other of which is adapted to lie along the casing for application and removal as a unit with the casing when the casing is wedged in a counterbore in organ mechanism.

2. A magnetic valve for organs comprising a casing provided in one side with an opening forming an air port, a solenoid in the casing, an armature for the solenoid, a valve on the armature, said valve and said solenoid being disposed on opposite sides of said opening, there being a slot in said casing, a pin carried by the armature and

extending through said slot, a felt washer on the solenoid adapted to limit movement of and cushion the pin against shock, and a spring disposed exteriorly of the casing having a pair of legs one of which is adapted to be engaged with said pin and the other of which is adapted to lie along the casing for application and removal as a unit with the casing when the casing is wedged in a counterbore in organ mechanism.

3. The combination with an organ wind chest having a counterbore forming an air passage, of a magnetic valve comprising a casing open at one end, the open end of said casing being adapted to be inserted in said counterbore and frictionally secured without the use of screws or other connectors, there being an opening in the side of said casing below said counterbore, a solenoid in the casing below said opening, an armature for the solenoid, a valve on the armature above said opening adapted to seat on the inner wall of said counterbore and control flow of air through the counterbore, a pin carried by the armature, there being a slot in the side of the casing opposite said opening through which said pin projects, and a helical spring having parallel legs one of which is engaged underneath said pin and the other of which is provided with a bent extremity adapted to be inserted in said counterbore and wedged therein by said casing.

4. A magnetic valve for organs comprising a casing, there being an opening in the side of said casing forming an air port, a solenoid in said casing, an armature for the solenoid extending across said opening, a pair of spaced valves on said armature, there being a slot in said casing, a pin carried by the armature projecting through said slot, and a helical spring having a pair of spaced legs disposed exteriorly of the casing, one of said legs engaging the pin and the other of said legs being terminally bent to extend longitudinally of the casing for application and removal as a unit with the casing from the counterbore formed in organ apparatus.

5. The combination with organ pipes, an organ chest having a pine board connected to the pipes and forming a sounding board, of a plurality of magnetic valves mounted on the board and controlling air flow from the chest to the respective pipes, said valves each having a casing provided in one side with an opening forming an air port, a solenoid in the casing, an armature for the solenoid, a valve on the armature, said valve and said solenoid being disposed on opposite sides of said opening, there being a slot in said casing, a pin carried by the armature and extending through the slot, and a spring disposed exteriorly of the casing having a pair of legs one of which is adapted to be engaged with said pin and the other of which is adapted to lie along the casing for application and removal as a unit with the casing when the casing is wedged in a counterbore in said board.

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