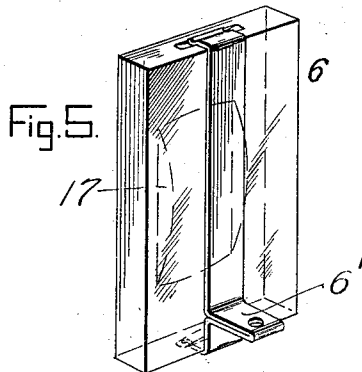
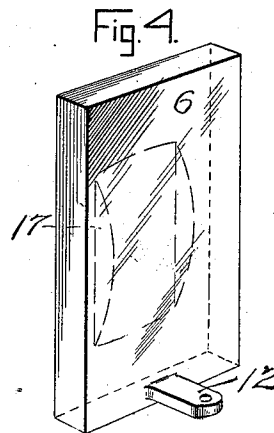
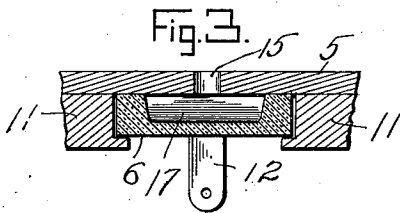
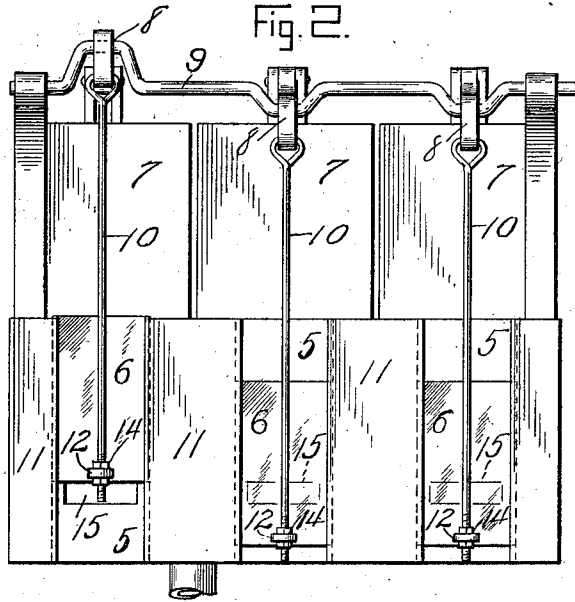
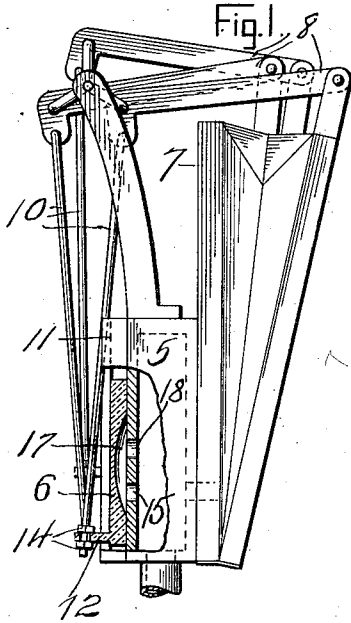


W. F. COOPER & E. P. CHASE.
SLIDE VALVE FOR AIR MOTORS.
APPLICATION FILED OCT. 30, 1909.

1,028,862.

Patented June 11, 1912.



Witnesses

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SLIDE-VALVE FOR AIR-MOTORS.

1,028,862.

Specification of Letters Patent.

Patented June 11, 1912.

Application filed October 30, 1909. Serial No. 525,567.

To all whom it may concern:

Be it known that we, WILLIAM F. COOPER and EDWARD P. CHASE, citizens of the United States of America, residing at Norwalk, in the county of Huron and State of Ohio, have invented certain new and useful Improvements in Slide-Valves for Air-Motors, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to certain new and useful improvements in slide valves for air motors, the invention relating particularly to the slide valves used in air motors of that type which are employed in connection with pneumatically-operated player mechanism for pianos and like keyed instruments.

Motors of the type referred to heretofore have generally been constructed of wood, that is, the slide valve or valves of the motor have been constructed of wood, and the face of the motor body or base on which the slide operates has also been constructed of wood, the slide valve being held into contact with the base by the exhaust pressure with which these motors are universally operated. Considerable difficulty has been encountered in connection with the operation of motors of this type, in that it has been found impractical to lubricate the slide valves and in that the wood slide operating against a wooden face has a tendency to cause the two wooden parts to cling together, and thus interfere with the free easy movement of the slide as it is moved back and forth by the action of the pneumatics, this difficulty being accentuated by the exhaust pressure operating to hold the slide valve against its base. Numerous experimenters have endeavored to overcome this clinging action of the slide valve by substituting metal slides on wood bases, also metal to metal and numerous other combinations, but up to the present discovery of the effectiveness of glass sliding on wood, no satisfactory substitute for wooden slides has been found.

The primary object of our invention is therefore, to provide a motor with a slide of glass or similar material having silica as an element, whereby all tendency of the slide to stick or cling is obviated, and the effectiveness of the motor thereby materially increased.

Another object of our invention is to provide a transparent glass slide valve to ma-

terially improve and assist in the adjustment of the valve to admit air to and from the actuating pneumatics. We have found that the transparency of the slide valves allows of a more accurate adjustment of the position at which the channel under the slide opens into the pneumatics.

With this primary object, and such other objects in view as will appear hereinafter as the invention is more fully described and explained, the invention consists in the novel construction and arrangement, an embodiment of which is shown in the accompanying drawings, wherein:

Figure 1 is a view in end elevation of an air motor of the type referred to, partially in section to show the slide and the face upon which the same works. Fig. 2 is a view of the motor in front elevation. Fig. 3 is a detail sectional view of one of the slide valves and a part of the face on which the same works, and, Fig. 4 is a detached detail perspective view of a slide valve in accordance with our invention. Fig. 5 shows a method of attaching to plate glass.

Since our invention resides in the nature of the slide valve which is used in the motor, it is deemed unnecessary to show the latter in detail, and consequently the showing thereof made in Figs. 1 and 2 is largely conventional, as it is understood by those skilled in the art that these motors comprise a ported motor body or board 5 on the front face of which the slide valve or valves 6 are moved to cover and uncover the port or ports of said body, the bellows 7 being attached to the rear face of the board 5 and being actuated by connecting rods 8 which are attached on to the crank shaft 9 of the motor, valve or slide rods 10 connecting the slide valve or valves 6 either with the connecting rods 8 as shown in the present form of construction, or with the crank shaft 9. As the crank shaft 9 is driven, these rods 10 cause the slide valve or valves 6 to be moved over the front face of the board or motor body 5 to cover and uncover the ports therein, the port 18 supplying a constant exhaust pressure to the channel 17 under the valve 6 and the motion of the valve alternately admitting the exhaust pressure to the pneumatic to draw the air from the same and then opening the ports 15 allowing the pneumatics to draw air from the outside, as is well understood by those skilled in the art.

As heretofore stated, these slides 6 have generally been constructed of wood, and during operation, have a tendency to cling to the face of the board 5 on which they operate.

5 We have discovered that this tendency of the valves to stick or cling is wholly obviated by making the valves of a vitreous material, preferably glass. In putting our invention into practice therefore, it will be

10 observed that no alteration in the construction of the motor is required, the valves 6 being held in their position on the front face of the motor body and guided in their movement thereon by cleats or guides 11 in

15 the ordinary manner. The valve or slide rods 10 may be connected to the glass slide valves 6 in any suitable or desired manner, that herein shown comprising the provision of an apertured lug 12 near the lower end of

20 the slide so that the valve or slide rods 10 can be connected to the lug in any suitable manner, such for instance as illustrated at 14 in Fig. 1. Obviously, as the slide valves are moved they will cover and uncover the

25 ports 15 of the motor in the usual manner. Each slide valve may be used to cover and uncover one or more ports as is common with these motors. Another method of attaching this valve rod is shown in Fig. 5, in

30 which the slide is made from a piece of plate glass and is provided with an attaching lug 6', which is sprung over each end of the slide valve, this being found commercially a preferred construction.

35 It has been demonstrated, that wooden slide valves, no matter as to the nature of the wood, when operating against a wooden face, have a material tendency to develop a peculiar sticking surface, and this often-

40 times occurs within a short time after the first use of the slide valve, whereas it has been demonstrated that a vitreous slide has no tendency whatever to acquire this sticking surface, and we have also learned by

45 practical test, that the slide valve constructed of vitreous material produces a superior result over the wooden slide practically from the beginning of the operation of the motor, and affording an increase of the

50 power derived from the motor. There is no tendency whatever of the vitreous material to develop an adhesiveness for the wooden face upon which it slides, and naturally an increase in the amount of

55 motive power resulting is obtained, other conditions being equal.

Although we have in use employed slides made of glass, we do not wish to confine ourselves to this specific material, as a slide con-

structed of any vitreous material made with silica may produce the same results as a glass slide.

We consider that the main feature of our invention lies in the combination of a slide valve and a base for said slide valve, one part being formed of glass and the other of wood, and we have demonstrated that the combination of a wood slide valve and a glass base will produce the same beneficial results as the reverse construction, though we believe that the glass slide and wood base is the preferred construction. We therefore, claim either the use of a glass slide on a wood base, or a wood slide on a glass base.

Having fully described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In air motors, the combination of two parts, a slide valve and a base upon which said valve moves slidably, one of said parts being formed of a non-vitreous non-elastic material, the other part being formed of a vitreous material.

2. In air motors, the combination with a body having a non-vitreous non-metallic non-elastic slide face, of a slide valve operative slidably on said face and formed of vitreous material.

3. In air motors, the combination with the body having a wooden slide face, of a slide valve operative on said face and formed of vitreous material.

4. In air motors, the combination with the body having a wooden slide face, of a slide valve operative on said face and formed of glass.

5. An air motor having a wooden slide face, and a slide valve movable thereon to cover and uncover the port or ports in said face, said slide valve being formed of vitreous material.

6. In air motors, the combination of two parts, a slide valve and a base upon which the said slide moves, one part being formed of glass and the other of wood.

7. A slide valve for air motors formed of plate glass, means for actuating said valve, said means being attached to said valve by a spring clip.

In testimony whereof we affix our signatures in the presence of two witnesses.

WILLIAM F. COOPER.
EDWARD P. CHASE.

Witnesses:

CHARLES SUHR,
J. M. BECHTOL.