

No. 698,905.

Patented Apr. 29, 1902.

M. CLARK.

VALVE FOR PNEUMATIC MUSICAL INSTRUMENTS.

(Application filed July 23, 1901.)

(No Model.)

Fig. 1

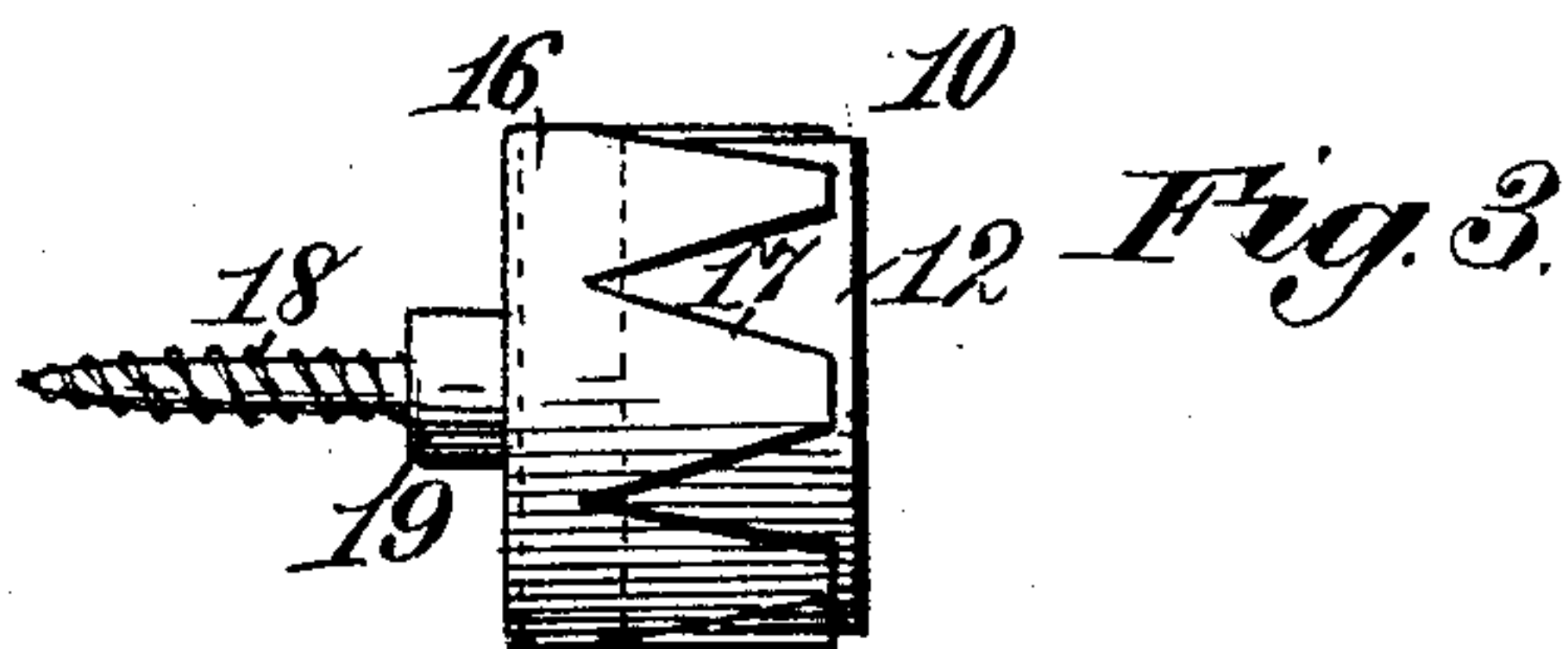
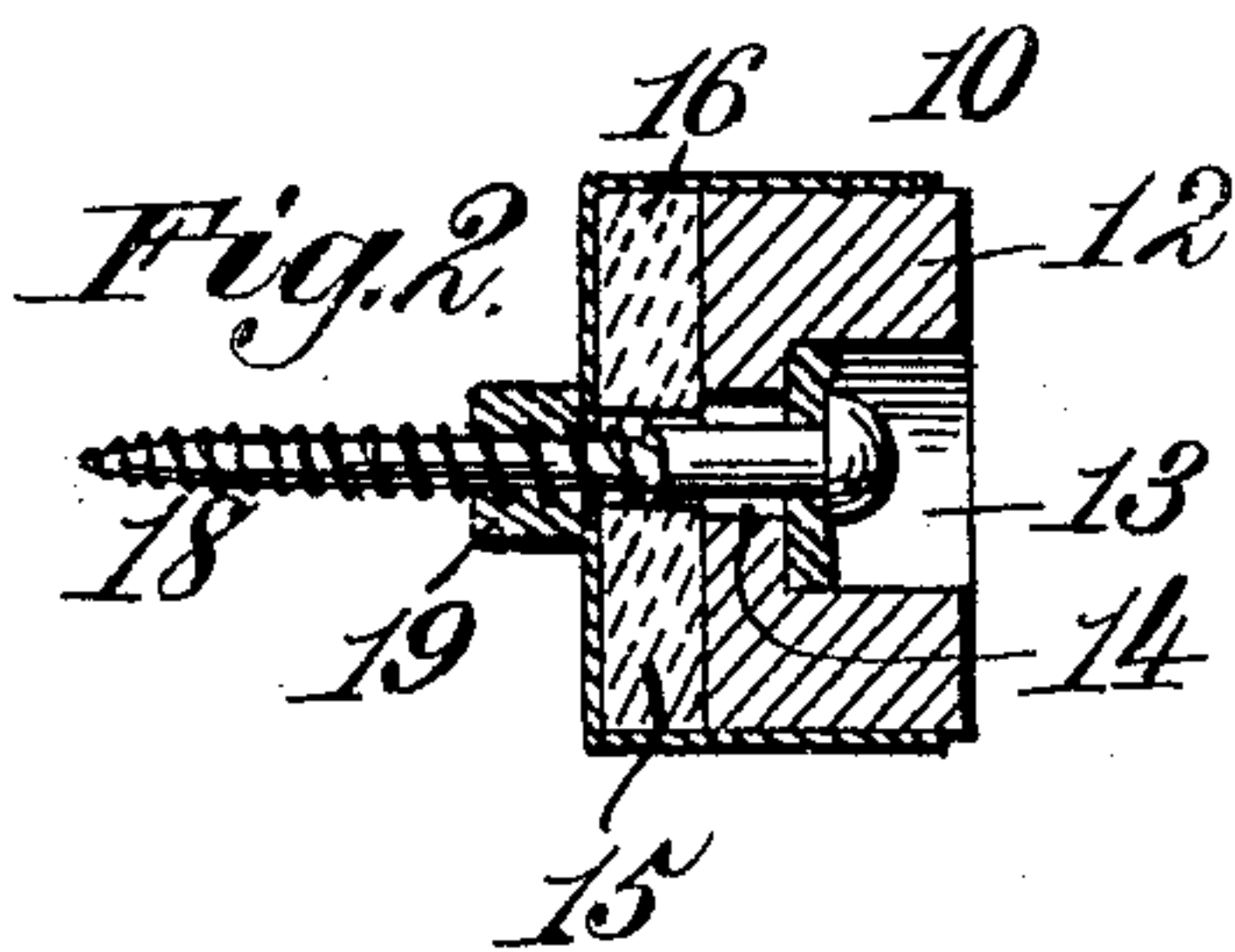
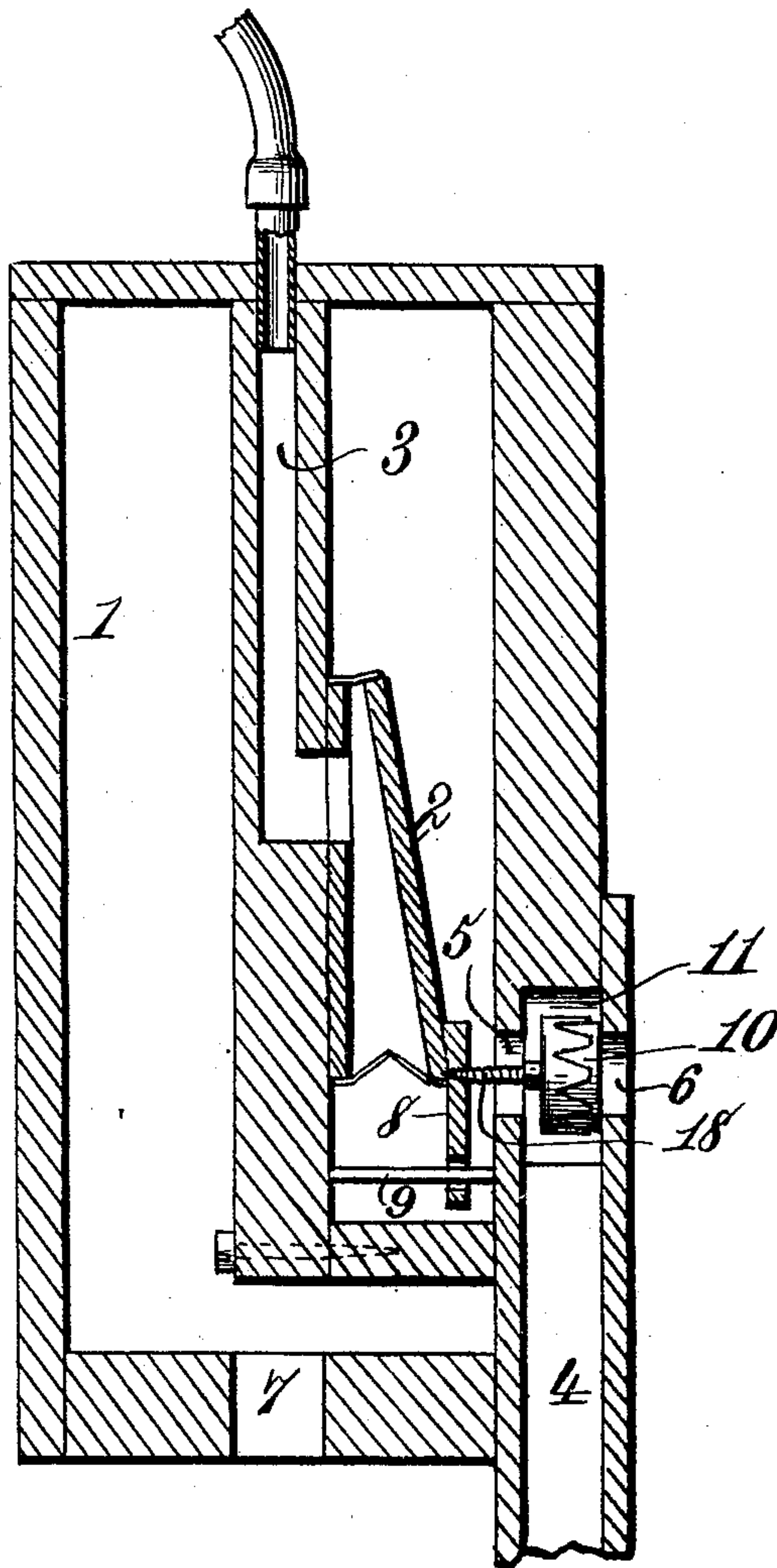
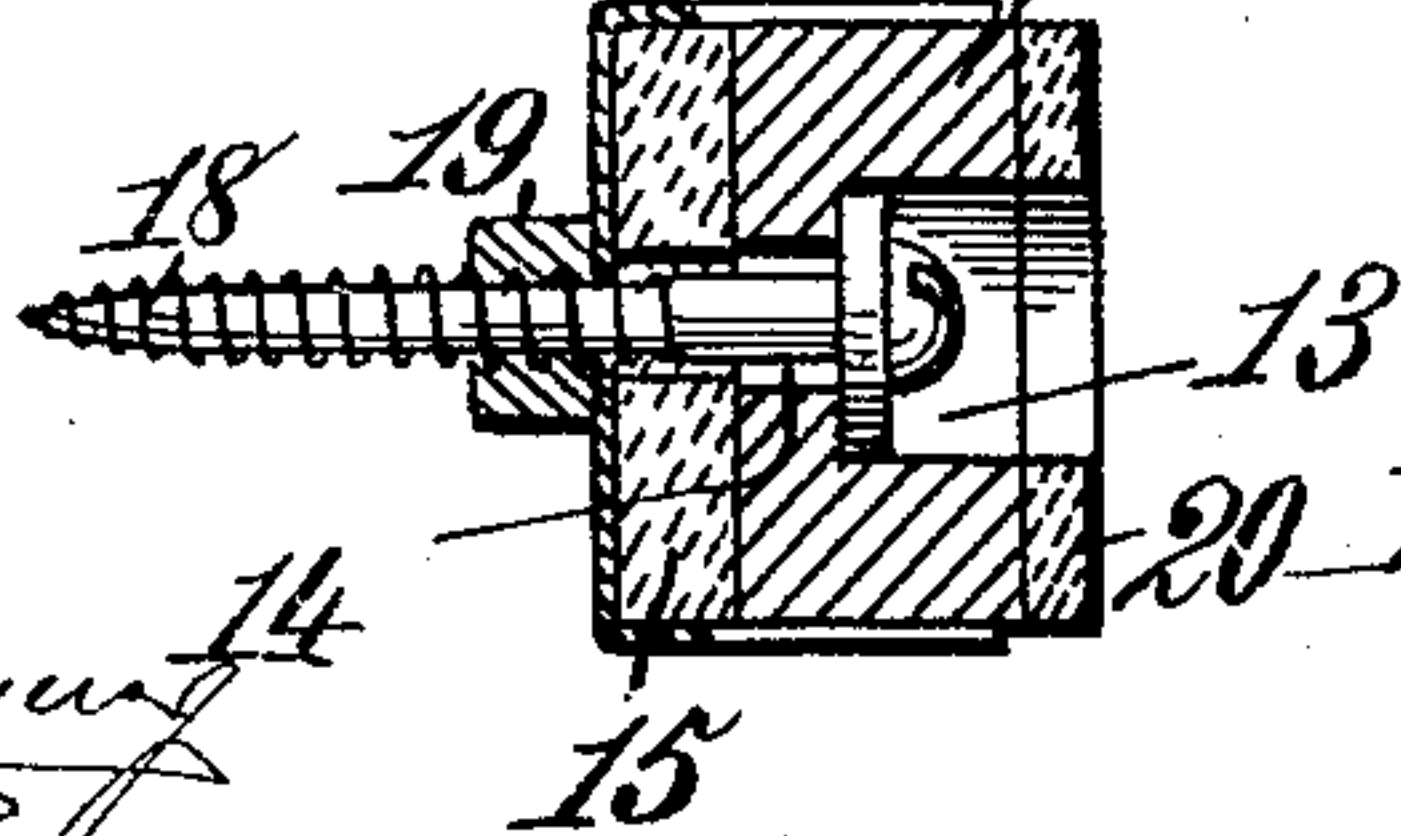


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## VALVE FOR PNEUMATIC MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 698,905, dated April 29, 1902.

Application filed July 23, 1901. Serial No. 69,349. (No model.)

*To all whom it may concern:*

Be it known that I, MELVILLE CLARK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valves for Pneumatic Musical Instruments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to valves for pneumatic musical instruments, and more especially to puppet-valves employed in connection with that type of instruments for which I obtained Letters Patent on the 30th day of October, 1900, No. 660,560. Heretofore great difficulty has been experienced in causing the valves employed in such instruments to seat themselves accurately and satisfactorily unless great skill, painstaking care, and time be employed in constructing and fitting said valves; and it is the purpose of my invention to provide valves of the nature referred to that will be simple, can be manufactured cheaply and expeditiously, and which will accurately and closely seat themselves under all circumstances, so as to effectually preclude any leakage of air past said valves.

To these ends my invention consists in the features and in the construction and arrangement of parts hereinafter described, and particularly pointed out in the claims following the description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a sectional view of a part of a pneumatic musical instrument, showing my improved valve applied thereto. Fig. 2 is a central sectional view of my improved valve. Fig. 3 is a view in side elevation thereof, and Fig. 4 is a sectional view illustrating a modification.

In order that my invention may be clearly understood, I will first briefly describe a part of a pneumatic musical instrument, showing my improved valve applied thereto.

Referring to the drawings, the numeral 1 indicates the wind-chest of a pneumatic musical instrument; 2, one of the primary pneumatics arranged therein and actuating the

valve for controlling the communication between the wind-chest and the channel leading to the motor-pneumatic; 3, the channel leading to the tracker-board; 4, the channel leading to the motor-pneumatic, (not shown;) 5, the port through which the motor-pneumatic channel communicates with the wind-chest; 6, the port arranged opposite the port 5 and leading to the atmosphere; 7, the bellows-opening in the wind-chest; 8, an arm rigidly fastened to the movable wall of the primary pneumatic; 9, a guide-rod fixed in the wind-chest and loosely passing through the free end of the arm 8, and the numeral 10 indicates generally my improved valve which controls the channel leading to motor-pneumatic. The end of the motor-pneumatic channel is enlarged, as at 11, between the ports 5 and 6 to form a valve-chamber for the valve.

All the parts above referred to, excepting my improved valve, are well known to those skilled in the art and need not be herein described in detail.

As in my patented device hereinbefore referred to, the valve is rigidly secured to a movable wall of the primary pneumatic, and it is the purpose of the present invention to so construct the valve that it may have a universal oscillatory or angular movement on its support in order that it may accurately accommodate itself to its seat and effect a perfectly air-tight closure. This result I accomplish by constructing the valve in the following manner: The body of the valve consists of a disk or button 12, which may conveniently be formed of wood, provided centrally on its outer side with a circular countersink or mortise 13, that extends nearly to, but not through, the inner side of the button. Formed centrally in the bottom of the countersink or mortise is a perforation 14, that extends entirely through the button. Arranged on the inner side of the button is a disk or cushion 15, of felt or similar yielding material, of the same shape and diameter as the button. The felt disk is held in place on the button by a covering 16, of thin leather or the like, which extends over the face of the disk and over its edge or sides, the edge of said cover being serrated, as at 17, and attached to the sides of the button by cement or other suitable fas-



tening means. The thin leather covering not only serves as a means for holding the felt disk to the face of the button, but also serves as an impervious facing for the valve, that will effect a tight closure of the valve on its seat and effectually prevent any leakage of air past the valve. Passing through the button, felt disk, and the leather covering is a screw 18, that is screwed into the arm 8, carried by the movable wall of the primary pneumatic, and into said movable wall and forms a rigid support or stem for the valve. The perforation 14 in the button is of such diameter relatively to the screw that the button has a free universal oscillatory movement on the screw—that is to say, the button is free to assume an angular position on the screw in any direction—and inasmuch as the felt disk and thin leather covering are of yielding material it will be obvious that the entire valve may readily assume any position relatively to the screw in any direction, so that when the valve moves to close the port 5 it will automatically accommodate itself to its seat and accurately contact itself with every part thereof. A small washer 19, preferably of leather or similar material, is screwed upon the screw and against the leather covering 16. The washer 19 performs a two-fold function. It serves to prevent any leakage of air through the leather covering or the felt disk about the screw, and it also serves to hold the valve in place on the screw, and by pressing against the leather covering and felt disk at their centers maintains the cushion part of the valve in shape. It will be noted that the ports 5 and 6 are arranged opposite one another, and the head of the screw lies in the countersink or mortise 13. Hence the screw is always readily accessible from the exterior of the wind-chest, so that it may be conveniently turned to adjust the valve relatively to the movable wall of the primary pneumatic.

The operation of my improved valve will be readily understood by those skilled in the art. A vacuum is constantly maintained in the wind-chest, and as long as the channel leading from the primary pneumatic to the tracker-board is kept closed by the paper music-sheet in the usual manner the primary pneumatic will be collapsed and the valve thereby held to its seat about the port 5, thus shutting off the communication between the motor-pneumatic channel and the wind-chest and putting said channel into communication with the atmosphere through the port 6. When, however, one of the perforations in the music-sheet operates to vent the primary pneumatic through the channel leading to the tracker-board, the primary pneumatic expands under atmospheric pressure and forces the valve away from the port 5 and against its seat about the port 6, thereby establishing communication between the motor-pneumatic channel and the wind-chest through the port

5. As before stated, the screw is readily accessible from the exterior of the wind-chest in order that the valve may be readily adjusted, and said adjusting-screw forms a stem for the valve, that supports and carries the latter.

If desired, a flexible or yielding washer 20 may be fixed to the outer side of the button 12 (see Fig. 4) for the purpose of forming an air-tight junction between the valve and its seat about the port 6 and for the further purpose of rendering the action of the valve noiseless; but such washer is not absolutely indispensable.

While I have shown my improved valve arranged in connection with a pneumatic musical-instrument player of the type shown in my said Letters Patent hereinbefore recited, it will be manifest that it may also be employed in connection with other types of such devices.

In the construction shown in the drawings it will be seen that the movable wall of the primary pneumatic 2 is flexibly connected to the base or fixed wall. Hence it will be seen that said movable wall is free to rock or move laterally in all directions and constitutes substantially a universal connection for the stem that carries the valve, and this arrangement, together with the peculiar mounting of the valve itself upon the stem, permits of said valve making a close and perfect seating at all times without any liability of the valve sliding over whatever point of its face first strikes the valve-seat to bring the entire face of the valve to its seat.

Having described my invention, what I claim is—

1. A valve for pneumatic musical instruments comprising a button of non-yielding material having a centrally-arranged opening therethrough, a stem of less diameter than the smallest diameter of said opening passing loosely through the latter, a valve-seat of yielding material on one face of the button, and means acting upon opposite sides of the valve for preventing any appreciable longitudinal movement thereof relatively to the stem, the arrangement being such that the valve may have a universal angular movement on the stem, for the purpose specified.

2. A valve for pneumatic musical instruments comprising a centrally-apertured button of non-yielding material, a stem of less diameter than said aperture passing freely therethrough, a valve-seat of yielding material on one face of the button, and a flexible connection between said valve-seat and button, the arrangement being such that the valve will have a universal angular movement on the stem.

3. A valve for pneumatic musical instruments comprising a centrally-apertured button of non-yielding material, a stem of less diameter than said opening passing freely therethrough, a valve-seat of yielding mate-



rial on one face of the button, and a flexible cover inclosing the valve-seat and having a connection with the button.

4. A valve for pneumatic musical instruments comprising a stem, a valve-body loosely mounted on the stem and universally movable angularly relatively to the stem, and means carried by the stem and acting upon opposite faces of the valve to prevent the latter from moving longitudinally on the stem, for the purpose specified.

5. A valve for pneumatic musical instruments comprising a stem, a valve-body mounted loosely on the stem and universally movable angularly relatively to the stem, a flexible valve-seat disposed on one face of the valve-body, and means carried by the stem and acting upon opposite sides of the valve-body for preventing the latter from moving longitudinally on the stem, substantially as specified.

6. In a pneumatic musical instrument, the combination with a primary pneumatic whose movable wall is flexibly attached to its support, of a valve-stem secured to said movable wall, a valve loosely mounted on the stem and universally movable angularly relatively to the stem, and means carried by the stem acting upon opposite sides of the valve to prevent the latter from moving longitudinally on the stem, the arrangement being such that the valve is free to rock on its stem when it engages the valve-seat, without sliding over whatever point of its face first strikes the seat, whereby the entire face of the valve is squarely seated.

7. A valve for pneumatic musical instruments comprising a button of non-yielding material provided centrally on one side with a countersink and centrally perforated, a screw of less diameter than said perforation passing through the latter, the head of the screw being seated in the said countersink, means for yieldingly connecting the button to the screw so that it will be capable of moving freely thereon in an angular direction relatively to the stem, and means for preventing the button from moving longitudinally on the stem, substantially as described.

8. A valve for pneumatic musical instruments, comprising a valve-stem, a button mounted on the stem and freely movable in an angular direction relatively thereto, a yielding disk disposed on the face of the button, and a flexible strip extending over the face of the disk and attached to the button for holding the disk in place, substantially as described.

9. A valve for pneumatic musical instruments, comprising a valve-stem, a button mounted on the stem and freely movable in an angular direction relatively thereto, a yielding disk disposed on the face of the button, and a flexible cover extending over the face of the disk and the sides of the disk and

button and attached to the latter, substantially as described.

10. A valve for pneumatic musical instruments, comprising a valve-stem, a button mounted on the stem and freely movable in an angular direction relatively thereto, a yielding disk disposed on the face of the button, and a flexible cover extending over the face of the disk and the sides of the disk and button, said cover having a serrated edge portion cemented to the sides of the button, substantially as described.

11. A valve for pneumatic musical instruments, comprising an adjusting-screw, a rigid button provided centrally with a perforation larger than the screw through which the latter passes whereby the button is freely movable on the screw in an angular direction relatively to the latter, a yielding disk disposed on the face of the button, a flexible cover extending over the face and sides of the disk and attached to the sides of the button, and a washer screwed upon the screw against said cover, substantially as described.

12. A valve for pneumatic musical instruments, comprising an adjusting-screw, a wooden button provided centrally with a perforation larger than the screw through which the latter passes whereby the button is freely movable on the screw in an angular direction relatively to the latter, a felt disk disposed on the face of the button, a thin leather cover extending over the face and sides of the disk and cemented to the sides of the button, and a relatively small washer screwed upon the screw against the leather cover, substantially as described.

13. A valve for pneumatic musical instruments, comprising a cylindrical wooden button provided centrally on one side with a countersink and centrally perforated, a felt disk disposed on the other side of the button, a thin leather cover extending over the face and sides of the disk and cemented to the sides of the button, a screw of less diameter than the said perforation and passing through the latter, the disk and the cover, whereby the valve is freely movable on the screw in an angular direction relatively to the latter, and a relatively small leather washer screwed upon the screw against the said cover, the head of the screw being seated in the said countersink, substantially as described.

14. A valve for pneumatic musical instruments, comprising a valve-stem, a button yieldingly connected to the stem and freely movable in an angular direction relatively thereto, said button being cushioned on its opposite faces, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

MELVILLE CLARK.

Witnesses:

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HIRAM H. BRADLEY.