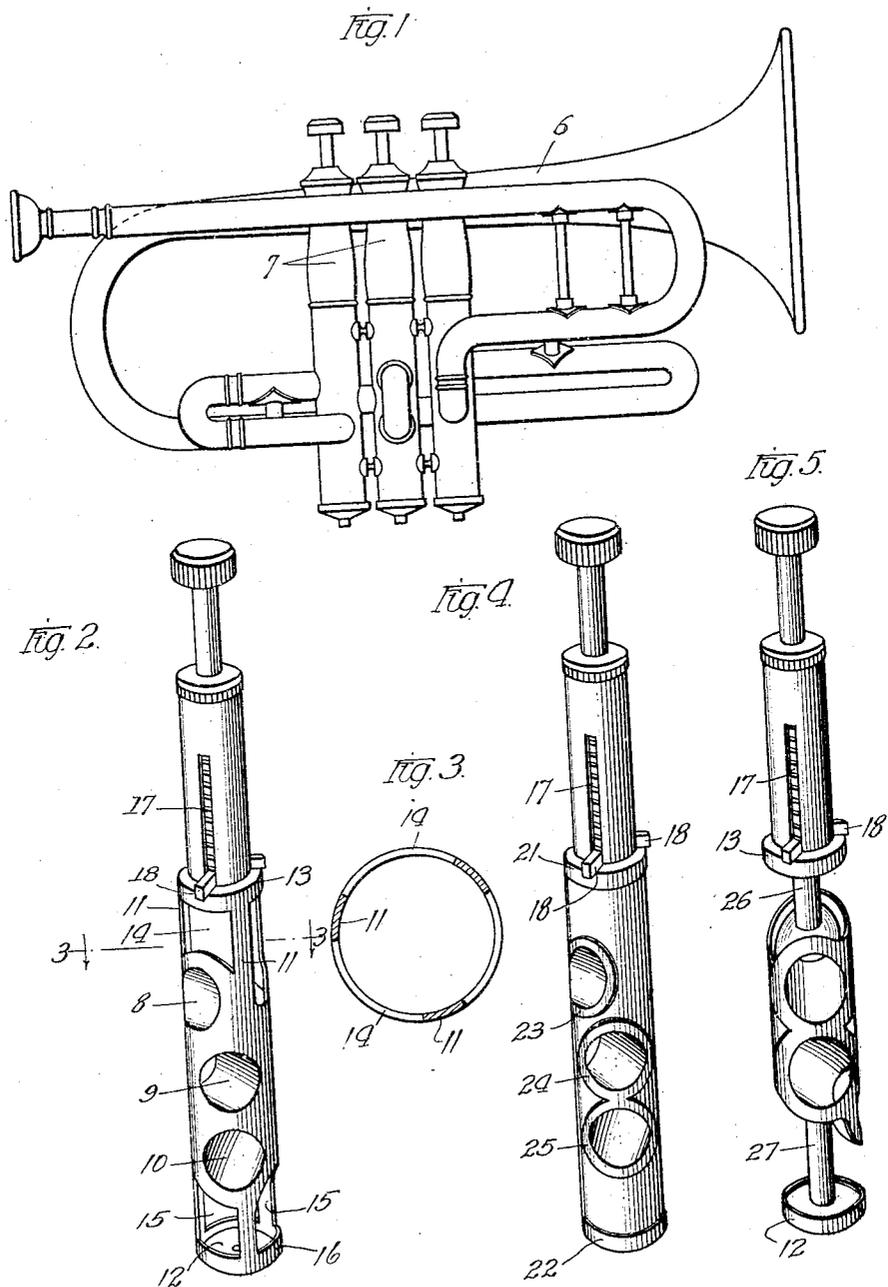


D. A. McDONALD.
 VALVE FOR WIND INSTRUMENTS.
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Patented Apr. 16, 1918.

1,263,084.



witnesses:
Robert Hoer
Arthur W. Lamb

Inventor
David A. McDonald
 By *Charles E. Buckley* Atty's.

UNITED STATES PATENT OFFICE.

DAVID A. McDONALD, OF CHICAGO, ILLINOIS, ASSIGNOR TO LYON & HEALY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

VALVE FOR WIND INSTRUMENTS.

1,263,084.

Specification of Letters Patent.

Patented Apr. 16, 1918.

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To all whom it may concern:

Be it known that I, DAVID A. McDONALD, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Valves for Wind Instruments, of which the following is a specification.

My invention relates to an improvement in valves for wind instruments, and particularly to the type of valve employed in cornets and instruments of this type.

By my invention I provide a quick acting valve which is lighter in construction than those heretofore employed, thereby rendering the use of a lighter spring and quicker action possible. Furthermore, a eliminate, to a great extent, the adhesion due to the film of moisture which collects on the piston of the valve during the playing of the instrument and in this manner prevent the valve from sticking.

These and other features of my invention will be more readily understood by having reference to the accompanying drawings whereby I have illustrated certain embodiments of my invention in connection with a cornet of well known type.

In the drawings:

Figure 1 is a side elevation of a cornet provided with valves embodying my invention.

Fig. 2 is a perspective detail of one of the improved valves shown in Fig. 1.

Fig. 3 is a sectional view taken on the line 3-3 of Fig. 2.

Fig. 4 is a perspective detail of a modified form of valve.

Fig. 5 is a perspective detail of a further modified form of valve.

In the drawings I have shown a cornet 6, which can be of any desired construction; which cornet is provided with three valves 7, which valves are similar in construction and are connected to the wind passage in the usual well known manner.

As is usual in valves of this character, each valve is provided with three tubular air passages 8, 9 and 10 through the medium of which air passages the system of tubing in the instrument may be varied by the operation of the valve. These three tubes 8, 9 and 10 are mounted in a cylindrical tubular support or piston 11 closed at its lower end by means of a cap 12 and provided at

its upper ends with a cap 13. Above the cap 13 the piston is reduced in diameter and contains the usual spiral spring 17 to the lower end of which the three pointed star 18 is secured. The ends of this star project slightly beyond the surface of the piston 11 and are adapted to engage with notches in the lining of the casing to cause the spring to be compressed when the piston is depressed. This is the usual construction of valves of this character and forms no part of my present invention.

In piston valves of this type it is found that the moisture caused by condensation or carried through the tubing into the valve during the playing of the instrument forms a film on the surface of the piston. This film of moisture causes the piston to stick and interferes with the free action of the valve by reason of the adhesion caused by the action of this film of moisture. Furthermore, any particles of dust which are carried in through the tubing to the valves work between the piston and the casing and impede the free operation thereof. In order to avoid these difficulties, I cut away all unnecessary portions of the cylindrical piston. Thus in the valve shown in Fig. 2 I cut away all the portions 14 above the tubular air passages, leaving merely sufficient portions of the piston to support these tubes. Likewise the portions 15 of the piston below the tubular air passages are cut away merely leaving slender supports for supporting the lower cap 12, a ring 16 being retained to form a bearing for the lower end of the piston. Around each end of the tubular air passages 8, 9 and 10 a sufficient section of metal is left to insure a tight engagement with the casing of the valve, thus preventing any leakage. With this construction I not only reduce the weight of the piston, thereby rendering it possible to employ a lighter spring to control the same thereby giving quicker action, but I also reduce the area of the piston which is in engagement with the valve casing and thereby lessen the friction between these parts and likewise practically eliminate adhesion due to the film of moisture which ordinarily forms on the surface of the piston during the playing of the instrument. Furthermore, any particles of dust carried into the valve soon work into the cut away spaces and thus do not impede the operation of the valve.

In Fig. 4 I have shown a modified form of valve. In this construction, instead of cutting out portions of the piston, as in the previous construction, I etch or otherwise
 5 remove the surface metal of all parts of the piston except immediately around the ends of the tubular air passages so that the only engagement between the valve casing and the piston occurs at the rings 21 and 22 at
 10 the opposite ends of the piston and at the rings 23, 24, 25 at the ends of the tubular air passages, which rings are of sufficient width to insure a tight fit between the air passages and the valve casing when the valve
 15 is operated. It will be seen that in this construction, as in the previous constructions, the surface area of engagement between the valve piston and the valve casing is greatly reduced and is merely sufficient
 20 to insure a tight valve connection. As in the previous construction so in this modified form any excess moisture carried into the valve soon works into the open space formed by having the metal cut away as described
 25 and likewise any particles of dust fall into this space and thus do not impede the operation of the valve.

In Fig. 5 I have shown a still further modified form of my invention in which the
 30 three tubes are supported by means of a central rod or pin 26 extending downwardly from the cap or collar 13 and by means of a second rod or pin 27 extending upward from the cap or collar 12. With this construction, as in the previous constructions,
 35 the area of contact between the piston and the casing of the valve is reduced to a minimum and thus the efficiency and free operation of the valve increased for the
 40 reasons heretofore set forth.

It will thus be seen that I have devised a very efficient form of valve for wind instruments and one in which a much lighter spring can be employed, as the weight and frictional surface of the piston have been
 45 materially reduced. Furthermore, by my improved construction I avoid the deterrent action of the film of moisture which forms on the piston causing the valve to stick.

While I have illustrated and described
 50 certain specific constructions for embodying the features of my invention, it will be obvious to those skilled in the art that these features and objects of my invention may be obtained by other specific embodiments with-
 55 out departing from the spirit and intent of my invention. I therefore wish it understood that my invention is not limited to the particular embodiments disclosed but is limited only in the manner specifically set
 60 forth in the appended claim.

What I claim as my invention is:

In a valve for wind instruments, a casing, a piston sliding within said casing, said
 65 piston comprising a collar having tight sliding connection with said casing, a central rod of less diameter than said collar extending downward therefrom, a plurality of air tubes integrally mounted together and carried by said rod, said air tubes having mar-
 70 ginal portions in tight sliding engagement with said casing, a second central rod secured to the lower portion of said air tubes and extending downward therefrom, and a
 75 second collar secured to the lower end of said second rod, said second collar having a tight sliding engagement with said casing.

Signed by me at Chicago, Illinois, this
 29th day of January, 1917.

DAVID A. McDONALD.