April 21, 1931. G. PRUEFER 1,801,690

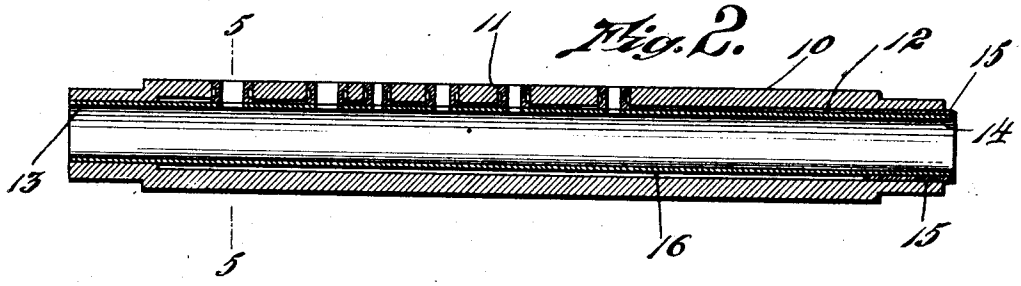
MUSICAL INSTRUMENT

Filed Feb. 6, 1930

Fig. 1.



Fig. 2.



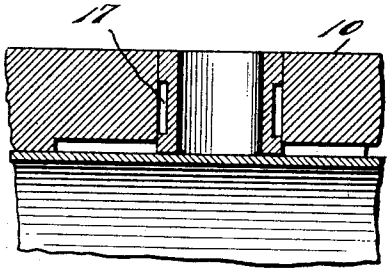


Fig. 3.

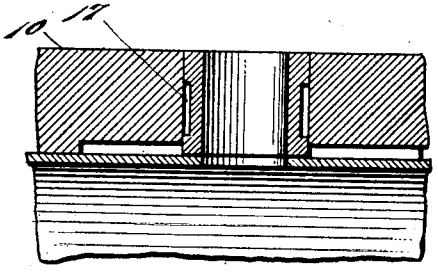
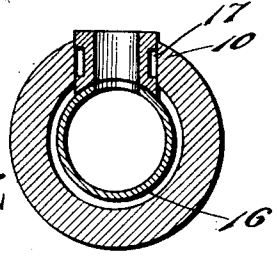


Fig. 4.

Fig. 6.



Fig. 5.



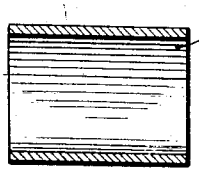


Fig. 7.

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UNITED STATES PATENT OFFICE

GUSTAV PRUEFER, OF PROVIDENCE, RHODE ISLAND

MUSICAL INSTRUMENT

Application filed February 6, 1930. Serial No. 426,294.

My present invention relates to musical instruments, and has particular reference to wind instruments of the clarinet type made of wood.

One object of my invention is to provide a construction for this type of instrument which will eliminate checks and cracks in the wood.

Another object of my invention is to provide a construction which will permit expansion or contraction of the wood without imparing tone quality.

A further object is to provide a wood instrument of this type with a metal inner tube spaced to provide a closed air chamber between the outer wood tube and the inner metal tube.

An additional object is to provide an improved method of construction of tone holes.

With these and other objects and advantageous features in view, the invention consists of a novel arrangement of parts more fully disclosed in the detailed description following, in conjunction with the accompanying drawings, and more particularly set forth in the appended claims.

In the drawings:

Fig. 1 is a plan view of the upper half of an improved clarinet;

Fig. 2 is a central section thereof;

Fig. 3 is an enlarged sectional detail showing the soldering of a tone hole tube;

Fig. 4 is an enlarged sectional detail showing the completed tone hole;

Fig. 5 is an enlarged section on the line 5—5 of Figure 2;

Fig. 6 is an elevation of a tone hole tube; and

Fig. 7 is a section of a spacer tube.

It has been found desirable to provide a construction which will prevent checks and cracks in wood instruments of the clarinet type by permitting free expansion or contraction of the wood tube in response to atmospheric and operating conditions. I have therefore devised a construction which positions a metal tube within the wood tube but spaced therefrom to form a closed air chamber, and I have provided tone hole tubes which are inserted in the tone hole openings of the wood tube and are soldered to the metal tube, the tone holes being then drilled through the metal tube; and the following is a detailed description of a preferred constructional embodiment of my invention.

Referring to the drawings, the wood tube 10, which is shown as the upper half of a clarinet, has a plurality of tone hole openings 11 therethrough, and is provided with a bore 12 of relatively large diameter terminating in a short bore 13 of smaller diameter at one end of the tube, in axial alignment with the bore 12.

An inner metal tube 14 fits snugly into the bore 13, and is provided with a spacer tube 15, preferably of rubber or a similar material, at the other end, to position the metal tube 14 within the wood tube 10 so as to provide a long cylindrical air chamber 16. The metal tube and its spacer tube are preferably mounted into the wood tube with a shellac binder. If desired, the wood tube may be provided with a uniform bore, and two spacer tubes 15 utilized, one at each end of the metal tube.

After the metal tube has been secured in the wood tube, tone hole tubes 17 of the proper sizes are inserted into the openings 11, these openings being of the usual different sizes, and the bottoms of the tone hole tubes are soldered to the metal tube, preferably by blowing thin solder adjacent the contacting surfaces of the tone hole tubes and the metal tube, the lower surface of each tone hole tube being shaped to fit the cylindrical surface of the metal tube. The use of thick tone hole tubes and of a small soldering flame produces a perfect soldered joint without scorching the wood. The tone holes are then drilled through the metal tube, and the instrument nicely finished for use.

My improved construction therefore eliminates checking and cracking of the wood tube, as this tube may freely expand and contract to accommodate itself to different atmospheric or operating conditions. Also any water which a careless user permits to remain in the instrument can no longer check the wood, as such water is confined to the

metal tube. In addition, the inner metal tube preserves the tone quality, as there can be no change in pitch due to shrinking of the outer wood tube; I therefore produce an improved wind instrument, having the appearance and the feel of a wood instrument, and the keeping qualities of a metal instrument.

I prefer to insert the metal tube in the upper joint of a clarinet, and not in the lower joint, thereby retaining the wood quality tone of the clarinet as a whole.

While I have described one specific embodiment of my invention, it is obvious that various changes in construction and in the manner of forming the tone openings may be made, without departing from the spirit and the scope of the invention as defined in the appended claims.

I claim:

1. A wind instrument having an outer wood tube, an inner metal tube, and means spacing said metal tube from said wood tube and permitting independent expansion and contraction of said tubes.

2. In a wind instrument, an outer wood tube having a plurality of openings therethrough, an inner metal tube secured within said wood tube in spaced concentric relation thereto to provide a closed air chamber therebetween, and metal tone hole tubes passing through said openings and communicating with said metal tube, whereby the wood tube may freely expand and contract without checking.

3. In a wind instrument, an outer wood tube having a plurality of openings therethrough, an inner metal tube secured at its ends within said wood tube in spaced concentric relation thereto to provide a closed air chamber therebetween, and tone hole tubes passing through said openings and communicating with said metal tube, whereby the wood tube may freely expand and contract without checking.

4. A method of constructing a wind intrument including the steps of boring tone hole openings in a wood tube, securing a metal tube within said wood tube in spaced concentric relation thereto, positioning metal tone hole tubes in said openings, soldering said tone hole tubes to the outer surface of said metal tube, and boring tone holes in said metal tube in alignment with the passageways of said tone hole tubes.

5. In a wind instrument, an outer wood tube having a plurality of openings therethrough, an inner metal tube having corresponding openings, means for securing said tubes together in spaced relation with the openings of the wood and metal tubes in substantial alignment, said means permitting relative expansion and contraction of said tubes, and tone hole tubes passing through said wood tube openings and communicating with said metal tube openings.

6. In a wind instrument, an outer wood tube having a plurality of openings therethrough, an inner metal tube having corresponding openings, means including a spacer tube for securing said tubes together in spaced relation with the openings of the wood and metal tubes in substantial alignment, said means permitting relative expansion and contraction of said tubes, and tone hole tubes passing through said wood tube openings and communicating with said metal tube openings.

In testimony whereof I affix my signature.

GUSTAV PRUEFER.