May 4, 1943. C. SPIVAK 2,318,535

MUTE

Filed Feb. 17, 1942

FIG. 1.

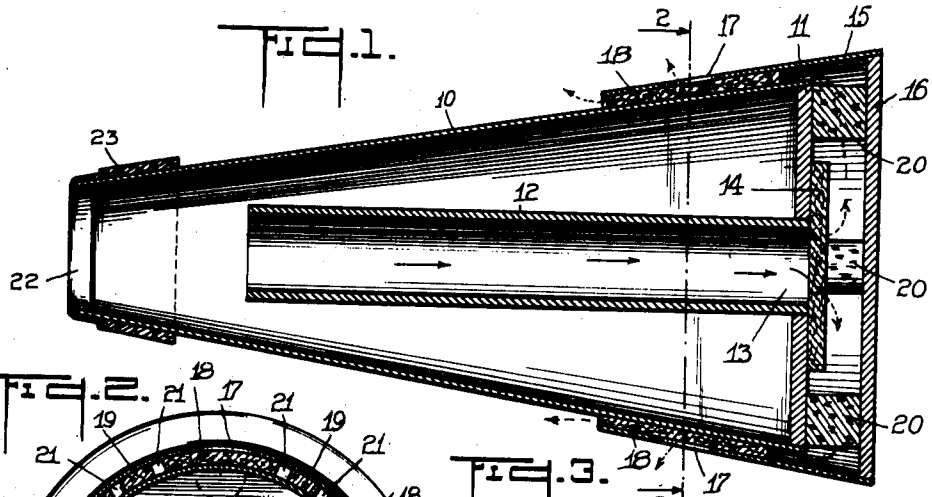


FIG. 2.

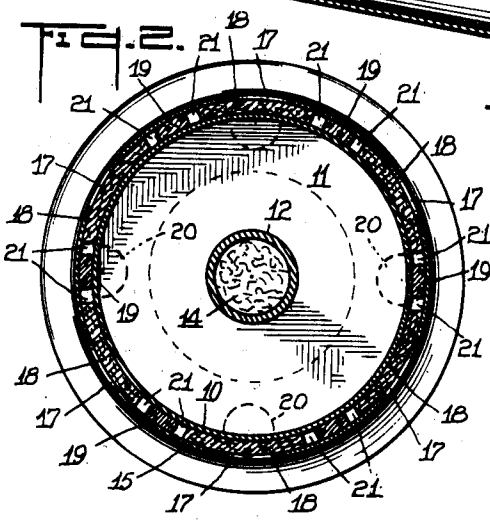


FIG. 3.

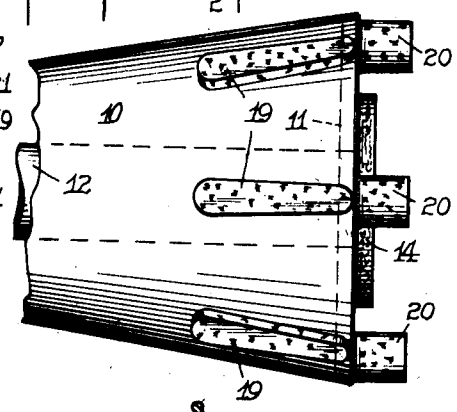


FIG. 4.

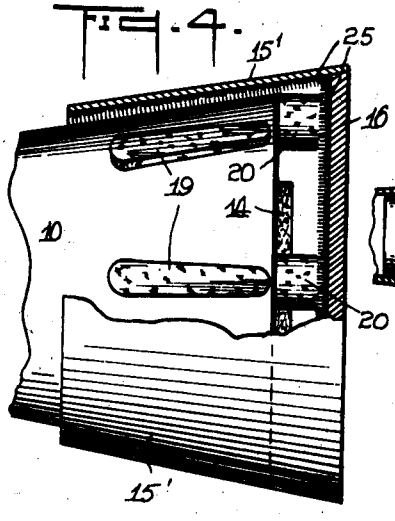
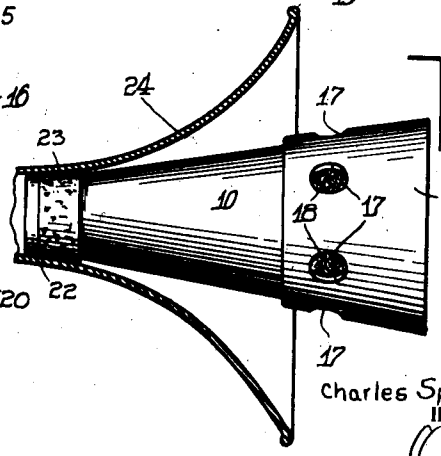


FIG. 5.



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MUTE

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Application February 17, 1942, Serial No. 431,187

16 Claims. (Cl. 84—400)

The invention relates to mutes for trumpets, trombones, cornets and other musical instruments of the wind type.

Mutes are used by musicians to qualify the sounds of their instruments. The main purpose of a mute is to muffle the sound.

An object of the present invention is to provide a mute which decreases the volume of sound of musical instruments in a new and efficient manner.

Another object of the invention is to construct the mute in such way that, apart from its damping action, it will not interfere with the tonal qualities of the sound.

A further object of the invention is to provide a mute of light weight and practical dimensions, which possesses a great muting capacity, especially on brass wind instruments.

With these and other objects in view, as will become more apparent hereafter, my invention is described in the following specification and illustrated, by way of example, in the accompanying drawing, in which—

Fig. 1 is a longitudinal sectional view of an embodiment of my improved mute;

Fig. 2 is a transverse sectional view on line 2—2 of Fig. 1;

Fig. 3 is a perspective view of the lower end of the inner element of the mute;

Fig. 4 is a partial view of a modified construction according to the present invention.

Fig. 5 shows the mute, in operative position, as applied to the bell of a conventional wind instrument.

In the drawing, reference numeral 10 denotes the end of the mute which is inserted into the bell of the instrument. Element 10 has the shape of a truncated cone although it may be given any other suitable shape. The wide end of conical element 10 is closed by disk 11 to form an inner chamber. Cylindrical tube 12 is coaxially disposed in conical element 10 and secured to disk 11. Tube 12 extends from a point near the narrow end of conical element 10 to opening 13 in disk 11. A piece of felt 14, or other sound absorbing material, is secured to disk 11 so as to close opening 13. The wide end of conical element 10 projects into cover 15 which is likewise of truncated cone shape, although other shapes may be used if desired. The wide end of cover 15 is closed by face plate 16 to form an outer chamber. Element 10 and cover 15 may be made of fibre board, cardboard, wood, plastics, metal or other suitable materials. Disk 11 and face plate 16 consist of wood or some other material adapted to vibrate. Disk 11 and plate 16 fulfill the function of sound boards. Tube 12 which in effect forms an in between chamber may be made of wood or metal or some other suitable material. Peripheral apertures 17 are provided on cover 15. Strips 18 of a sound absorbing material, such as felt, are disposed between cover 15 and conical element 10 so as to fully close apertures 17. Side spacers 19 and end spacers 20 keep conical element 10 and cover 15 in properly spaced relation. Spacers 19, 20 may be made of cork, rubber, hard felt and the like.

Each aperture 17 is flanked by two side spacers 19 to prevent deformation of cover 15. Six side spacers 19 and four end spacers 20 are shown although their numbers may be increased or decreased. Similarly, any desired number of apertures 17 may be provided. Spacers 19, 20 may be made of cork or any other suitable material. Between strips of felt 18 and side spacers 19 channels 21 are formed which are of sufficient size to permit ready secape of air currents.

Reenforcing ring 22, which embraces the narrow end of conical element 10, may consist of metal for instance. Packing ring 23 is disposed adjacent to reenforcing ring 22. Ring 23 is intended to be brought into tight contact with bell 24 for example of a trumpet or other musical instrument (Fig. 5). Packing ring 23 serves to support the mute in operative position as shown in Fig. 5. Ring 23 forms a tight seal which forces air currents and sound to enter the mute. Air currents are thus prevented from passing to the outside between the inside wall of bell 24 and the outside wall of element 10 of the mute.

A modification of the invention is illustrated in Fig. 4. This construction corresponds in all details to the device illustrated in Figs. 1 to 3 and 5, with the following exceptions: The cover 15′ and face plate 16′ are covered on their insides with lining 25 of a sound absorbing material for instance felt. Moreover, cover 15′ is solid all around, apertures 17 being omitted in this construction.

The mute is adapted for insertion into the sound passage of bell 24 of a musical instrument as may be seen in Fig. 5. When the instrument is played, the sound waves and air currents pass through the mute and are damped.

The outstanding results obtained by the new mute are attributed in part to the use of an inner chamber (elements 10, 11), an outer chamber (elements 15, 16) and tube 12 which intercommunicates with these chambers and forms an inbetween chamber. The inner chamber forms a

real pocket, especially due to its conical shape, in which air issuing from the instrument will become congested and sound will be absorbed. The air cushions formed in the inner and outer chambers also affect the vibration of elements 11 and 16. The muting action is further favorably influenced by felts 14, 17.

Thus, an effective muting action is obtained by the novel combination and arrangement of elements and parts as hereindescribed.

The intensity of the damping action of the mute may be varied by lengthening or shortening tube 12; by altering the size of apertures 17; by varying the size of felt strips 18 and spacers 19; by the use of heavier or lighter felt (14, 18) etc. These changes would merely involve matters of design.

The action of the modified construction shown in Fig. 4 is the same as that described above. A considerable damping effect is produced in the modified device by the sound absorbing lining 25.

I am aware of the fact that many changes may be made in the embodiments of the invention shown and described, without departing from the spirit and scope thereof. I therefore do not wish to be understood as limiting myself to the specific details of construction disclosed herein.

I claim:

1. A mute comprising a first element forming an inner chamber, a second element secured to said first element and forming an outer chamber, a conduit disposed in said inner chamber and communicating with said outer chamber, first stationary sound absorbing means associated with said conduit to reduce the volume of sound while the same passes from the inner chamber to the outer chamber through said conduit, said outer chamber being provided with sound outlet means, second stationary sound absorbing means associated with said outlet means to further reduce the sound while passing through said outlet means.

2. A mute for wind instruments, comprising an element adapted to be inserted into the bell of a wind instrument, said element forming a closed pocket, said pocket being provided wtih an opening, a piece of sound absorbing material associated with said opening and closing same, a second element partly enclosing said first element and forming a passageway with the same leading to the outside, sound absorbing means disposed in said passageway and partly obstructing the same, whereby sound travelling through said mute will be muted.

3. A mute for wind instruments comprising an inner member having truncated cone shape and being adapted to be inserted into the bell of a wind instrument, said inner member being open at the narrow end thereof, a disk closing the wide end of said inner member, a cylindrical tube secured to said disk, an outer member having truncated cone shape, an end plate closing the wide end of said outer member, the wide end of the inner member projecting into said outer member, said inner and outer members being substantially co-axially disposed with respect to each other and said disk and end plate being disposed substantially plane-parallel to each other, end spacing means disposed between said disk and plate and side spacing means disposed between the outer wall of the inner member and the inner wall of the outer member, an end space being thus formed between said disk and plate, said disk being provided with an aperture establishing communication between the inside of said tube and said end space, a piece of sound absorbing material closing said aperture, said outer member being provided with peripheral openings, sound absorbing means disposed behind said openings between the overlapping walls of said inner and outer members, air passages being provided between the overlapping walls of said inner and outer members, whereby sound, entering at the narrow end of said inner member will be muted.

4. The mute claimed in claim 3, in which a packing member is disposed adjacent the narrow end of said inner member, said packing member being adapted to contact with the bell of the wind instrument and form a tight packing in order to prevent sound and air from bypassing the mute, said packing member being also adapted to support the mute in the bell of the instrument to be muted.

5. The mute claimed in claim 3, in which said disk consists of a material adapted to vibrate.

6. The mute claimed in claim 3, in which said disk and end plate consist of material adapted to vibrate.

7. A mute for wind instruments, comprising a first element adapted to be inserted into the bell of a wind instrument, said first element forming a closed pocket, the latter being provided with an opening, a piece of sound absorbing material secured to said element and closing said opening, a second element secured to said first element and forming a chamber with the same, said pocket communicating with said chamber through said opening, whereby air currents and sound entering into said pocket will escape into said chamber through said opening, after passing through said sound absorbing material.

8. A mute for wind instruments, comprising a first element adapted to be inserted into the bell of a wind instrument, said element forming a first chamber provided with an opening, a second element secured to said first element, said second element forming a second chamber, the latter surrounding the portion of said first chamber wherein said opening is located, said second chamber being provided with an aperture, sound absorbing means associated with said aperture and closing same, said second chamber being also provided wtih an outlet establishing direct and unobstructed communication between said second chamber and the outside.

9. A mute for wind instruments, comprising a first element adapted to be inserted into the bell of a wind instrument, said element forming a first chamber, a conduit in said first chamber, a second element secured to said first element, said second element forming a second chamber, said first chamber communicating with said second chamber through said conduit, first sound absorbing means secured to said conduit and closing the same, said second chamber surrounding a portion of said first chamber and forming a passageway with the same leading to the outside, said second chamber being provided with a plurality of apertures leading from said passageway to the outside, pieces of sound absorbing material disposed in said passageway between said first and second chamber, each of said pieces closing one of said apertures, said pieces of sound absorbing material being spaced apart from one another to form free channels therebetween and permit direct communication between said second chamber and the outside.

10. The device claimed in claim 9 in which said first and second elements are of elongated shape

and said conduit is of tubular shape; and in which said apertures are peripherally arranged on said second element.

11. The mute claimed in claim 9, in which said first and second elements are of truncated cone shape and the wide end of said first element is inserted in the wide end of said second element.

12. The mute claimed in claim 9, in which said first element is provided with means adapted to form a packing with the bell of the instrument, said packing serving to support the mute in the bell of the instrument and preventing air currents to by-pass the mute.

13. The mute claimed in claim 9, in which spacing means are disposed between said first and second elements in the portion where said second element surrounds said first element, said spacing means serving to maintain the said elements in spaced position with respect to each other.

14. The mute claimed in claim 7, in which said second element is provided with an inside lining of sound absorbing material.

15. A mute for wind instruments, comprising a first element adapted to be inserted into the bell of a wind instrument, said first element forming an inner chamber, a second element secured to said first element, said second element forming an outer chamber, said first element being provided with an aperture establishing communication between said inner and outer chamber, said first element including a sound board.

16. The mute claimed in claim 15, in which said second element includes a sound board.

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