

A. W. WARD.

MUTE.

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1,369,370.

Patented Feb. 22, 1921.

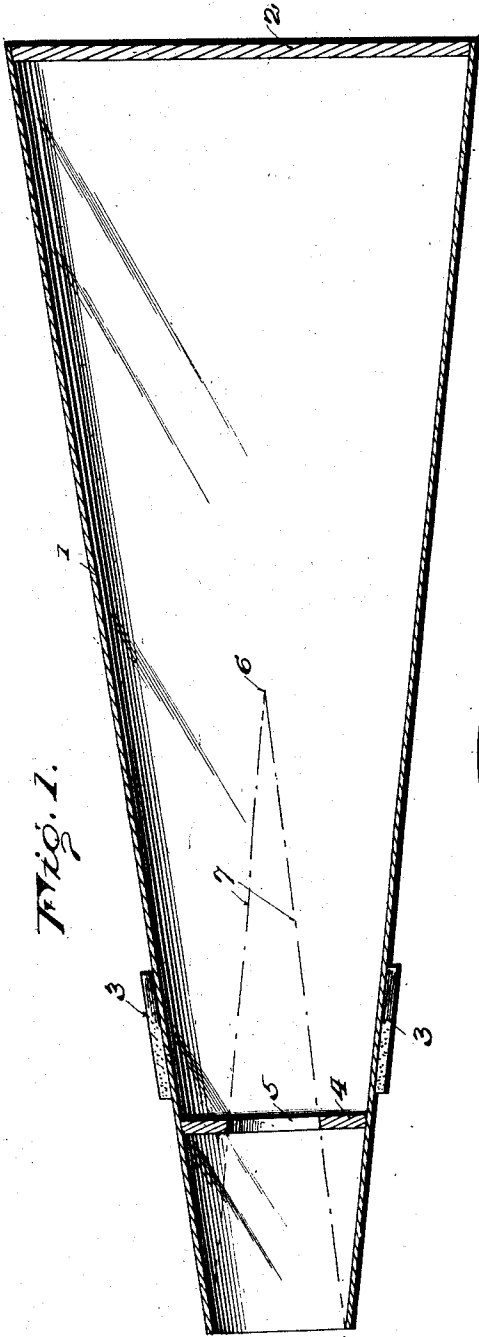


Fig. 1.

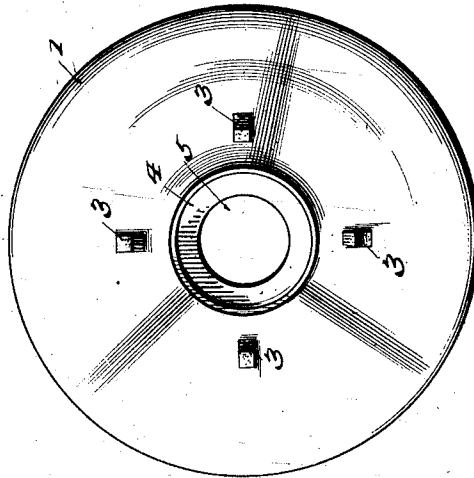


Fig. 2.

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MUTE.

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To all whom it may concern:

Be it known that I, ANDREW WILLIAM WARD, a citizen of the United States, and residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Mutes, of which the following is a specification.

This invention relates to improvements in mutes for brass musical instruments, especially for trombones, cornets, and the like.

The object of the invention is to provide a device of this character whereby the tone may be muted and still retain the same pitch as the open instrument. This device is especially useful when the instrument to which it is attached is used to accompany singers. The device also produces softer and more harmonious tones than has heretofore been produced by mutes now common in the art.

The invention also comprehends improvements in the details of construction which are particularly pointed out in the following description and claims.

In the drawings:—

Figure 1 is a sectional view of my improved device.

Fig. 2 is an end elevation thereof.

Reference numeral 1 indicates the main body of the device which is conical in shape and made of paper rolled in seamless veneers. The taper of the main body 1 is approximately the same as the interior of the horn or bell portion of the instrument in which it is used. The main body when in place in the bell portion of the instrument is slightly spaced from the wall of the instrument to allow the air passing through the horn which creates the sound waves to escape and only permitting the escapement of a small number of sound waves which are ineffective in the production of the sound heard without the instrument. The outer or larger end of the mute is closed by a paper or cardboard disk, indicated at 2, and secured in place in any suitable manner, for instance, gluing or the like. 3 indicates resilient blocks, preferably cork, which are glued to the periphery of the main body 1 near the small end thereof (see Fig. 1). Within the main body 1 near the small end thereof is rigidly mounted a pitch modifier 4, having a hole 5. The exact location of the rectifier 4

with respect to the small end of the main body 1 is determined by multiplying the diameter of the small opening by $1\frac{1}{2}$. The diameter of the hole 5 in the modifier 4 is determined by finding the longitudinal and vertical center of the main body 1 as indicated at 6. Lines indicated at 7 are then drawn from the small opening of the main body 1, to the center 6, and the point of intersection of these lines 7 with the modifier 4, determines the diameter of the hole 5.

The entire device inside and outside is coated with shellac or other suitable waterproof varnish to protect it from the moisture within the horn. It is placed in the bell-shaped portion of the horn and held in place by the wedging effect upon the resilient blocks 3. When the horn is played the sound vibrations enter the small opening of the main body 1, and are baffled by the modifier 4 thus reducing the number of vibrations to the same number as the open instrument. On passing through hole 5, the vibrations enter the larger chamber of the main body 1, causing the mute to vibrate and thus produce the desired muted tone.

The sound vibrations emitting from a horn expand from the small end to the large end and the sound produced by the vibrations is the result of the length of the sound wave at the large end. In constructing the mute above described, it was necessary to account for this increase in length of the vibrations in the bell portion of the instrument, the modifier therefore was inserted as above described to reduce the total number of vibrations in the chamber, so that the diaphragm 2 will vibrate to produce a sound having the same pitch as the open instrument.

The modifier in the mute being placed in the position as shown and described confines the sound waves in the mute chamber, so that the volume of tone is reduced without altering the pitch. To get this desired result it has been found necessary to construct the rectifier in the particular manner described.

What I claim is:

1. A mute for musical instruments comprising a tapered tubular body member, having its large end closed, and an opening in the small end, resilient blocks secured to said member near the small end there-

of, a pitch modifier mounted in the body member spaced from the small end and provided with an opening of less diameter than the small opening in the body member.

5 2. A mute for musical instruments comprising a body member formed similar to a frustum of a cone, and closed at the large end, blocks secured to said member near the small end thereof, and a modifier mounted
10 within the body a distance from the small

end, equal to one and one-half times the diameter of the opening in the small end, and formed with an opening, the circumference of the opening being determined by the intersection with the modifier of a cone 15 having its apex in the center of the body member and its base at the circumference of the small opening in the body member.

In testimony whereof I affix my signature.
ANDREW W. WARD.