

UNITED STATES PATENT OFFICE.

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SAXOPHONE AND OTHER REED INSTRUMENTS.

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To all whom it may concern:

Be it known that I, HENRY E. DREVES, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Saxophones and Other Reed Instruments, of which the following is a specification.

The present invention relates to an improvement in musical instruments and more particularly saxophones and reed instruments and the general object of the invention is to provide such instruments with an octave hole or socket which will in use facilitate a rapid change from one register to another, make the octave tones clearer in quality, prevent striking of air against the closure pad for the opening in a way to avoid buzzing, hissing or other objectionable effects when the pad is raised, and assure a quick effective and unobstructed opening.

In the drawing accompanying this application, Fig. 1 is a side view of a saxophone on a reduced scale, showing in full lines the mouth pipe in which one of my improved octave sockets is located, the main body of the instrument being shown in dotted lines. Fig. 2 is an enlarged side view of the mouth-pipe with the socket member and pad in section. Fig. 3 is a cross section considerably enlarged, on lines 3-3 of Fig. 2. Fig. 4 is an enlarged top view of the socket member itself.

In a saxophone the octave holes or sockets are used to produce tones one octave above those of the lower register extending the compass of the instrument one full octave above the actual pitch by length of pipe. The sounding of these upper tones is done by operating octave keys to open holes, that in effect cut the effective pitch length of the pipe in half, thus doubling the number of sound vibrations per second. To "cut" the effective pitch length of any pipe without impairing tone quality, an opening of very small size must be made at approximately the middle point of the pitch length. This opening gives a vent at a point in the sound wave formation called the node, thus splitting the sound wave and causing it to form in one half its previous length and raising the pitch one octave.

The opening of this vent must be as unobstructed as possible when in use in order

to facilitate the rapid change from one register to another. Heretofore this vent or octave hole has been drilled on a straight line axially through the octave socket member. When the pad is lifted it does not provide a quick effective means of "venting" this point. A buzzing noise due to the release of the alternating pressures at the nodal point and the air striking the pad characterizes the opening of this hole and is most noticeable in D, G and A in a saxophone. In brief, this "sluggishness" of action and buzzing does not permit rapid execution of octave "jumps", clearness of tone etc., as the notes in the upper register do not respond immediately to the opening of an axially drilled socket.

To avoid the "buzzing" or striking of air against the pad and to make the octave tones clearer in quality, and to provide a quick, sure, effective and unobstructed opening, I drill a hole 2 in a socket member 3 on a slant with respect to the motion of the pad 4. As a result, the pad upon raising vertically does not obstruct the opening of the hole and provides an unobstructed vent at the desired point. This eliminates all hissing, buzzing or other disagreeable features attached to the old type of socket.

Socket member —3— comprises a semi-spherical head 6 having a reduced stem 7 at its bottom which is adapted to extend through the pipe or tubular mouth-piece 5 and to be secured thereto in any suitable mechanical way. The soft sealing pad 4 at the end of the pivoted key —8— is concaved to fit the round head when seated snugly thereon and it covers the round outlet end of opening —2—, which outlet it should be noted is situated at one side of the axial center of the round head relatively near the rounded bottom edge 9 of the pad, see Fig. 3. This offset relation of the outlet in respect to the center of the cavity in the pad is obtained by drilling a straight hole through the head and stem at an inclination to the vertical axis of member —3—, and the bottom or inner entrance to the bore or hole is also offset in respect to the axis of the member and it may intersect the bottom corner of the stem in a plane substantially flush with the curved inner surface of the tube or pipe to obtain the best results. Member 3 is also preferably affixed to the tube or pipe with the inclined