

UNITED STATES PATENT OFFICE.

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TRIPLE AUTOMATIC OCTAVE MECHANISM FOR WOOD-WIND INSTRUMENTS.

Application filed October 28, 1925. Serial No. 65,372.

The present invention relates to musical instruments of the wood wind type having a reed for putting in vibration the column of air contained in the tubular body of the instrument. Within the meaning of "wood wind" as used in this specification, I include all instruments characterized by a body tube having lateral tone holes for determining the pitch of the vibrating column of air, whether such tubes are actually made of wood, or of metal or other material. Among the specific instruments included within this generic term are the saxophone, the oboe, and the bassoon. In such instruments each note of the second (the middle) register (or octave) is fingered the same as the same note of the lower (the first) register, but with the opening of an octave hole in addition, in order to make the note easy to sound. In the case of the oboe and bassoon, the notes above the second octave are obtained by complicated cross fingering, so-called, coupled with the use of an appropriate octave hole, but in the case of the saxophone the notes above the second octave are obtained by special keys which open additional holes nearer the end of the instrument to which the reed is fitted and into which the performer blows, which I may call the blowing end.

The theory underlying the use of octave holes is analogous to the principle of playing the harmonic octave on a stringed instrument by touching the string at mid length; that is, the formation of a node between vibrating fractional parts of the string or air column. However, owing to the friction of the vibrating air column in the bore of the wood wind instrument, and to other factors also, the best position for the octave hole in such instruments is elsewhere than at the mid length of the instrument. For each note in the chromatic scale however, there is one position which is best for the octave hole, but in practice it is obviously impossible to provide a separate octave hole and its key for each note of the scale, on account of the excessive complication which would result from so doing, wherefore in practice a compromise is reached on a much smaller number, each of which, of course, is placed in a compromise position.

The saxophone heretofore has only had two octave holes, the lower hole being in a position which is a compromise for seven

notes, and the upper in a position which is a compromise for nine notes. It is found by experience that if the upper hole is too far from the blowing end of the instrument, the highest notes are difficult to sound, while if it is too near the blowing end, the lowest notes which it controls are too sharp and have a fuzzy sound. As a matter of fact, both of these defects are present to a noticeable extent in the best saxophones made prior to this invention.

The principal object which I have had in devising the present invention has been to overcome the defects and difficulties in playing the notes controlled by the upper octave hole, and this I have accomplished by providing two upper octave holes, each of which controls a number of the notes previously controlled by the single upper octave hole, by which I have obtained a satisfactory compromise, facilitating the playing of the highest notes and correcting the tone quality of the lower ones of the notes formerly controlled by the upper octave hole.

In the embodiment of the invention herein illustrated, I have applied my present improvement to a saxophone in connection with an octave key mechanism previously devised by me, and disclosed in my prior application, Serial No. 617,952, filed February 9, 1923.

The invention may be said to consist in an octave key mechanism comprising a single lower octave hole and two upper octave holes, the latter holes controlling the highest notes of the register of the instrument, together with key mechanism adapted to change from the lower to the upper octave holes, and vice versa, and from one to the other of the upper octave holes automatically in the course of playing the instrument. The invention further comprises the combination of such upper octave holes and their key mechanism independent of the lower hole and the key mechanism therefor.

It should be understood that although the form of the invention herein illustrated and described in detail is particularly designed and adapted to a saxophone, I do not limit my claim to protection to this specific mechanism or its combination with a musical instrument of this species, but include all other mechanisms, combinations and instruments in which the same principles may be applied.

Referring to the drawings in which one