Aug. 28, 1945. A. JOHNSON 2,383,553

ELECTRICAL PICK-UP FOR WIND INSTRUMENTS

Filed Feb. 21, 1944 2 Sheets-Sheet 1

Fig. 1.

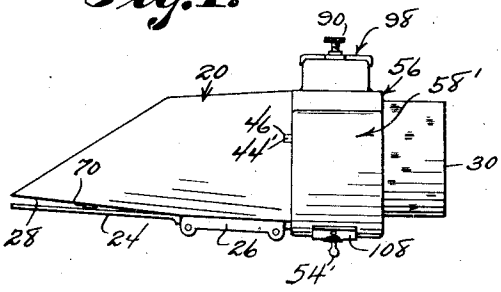


Fig. 2.

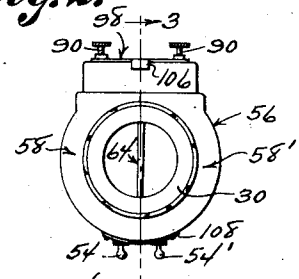


Fig. 3.

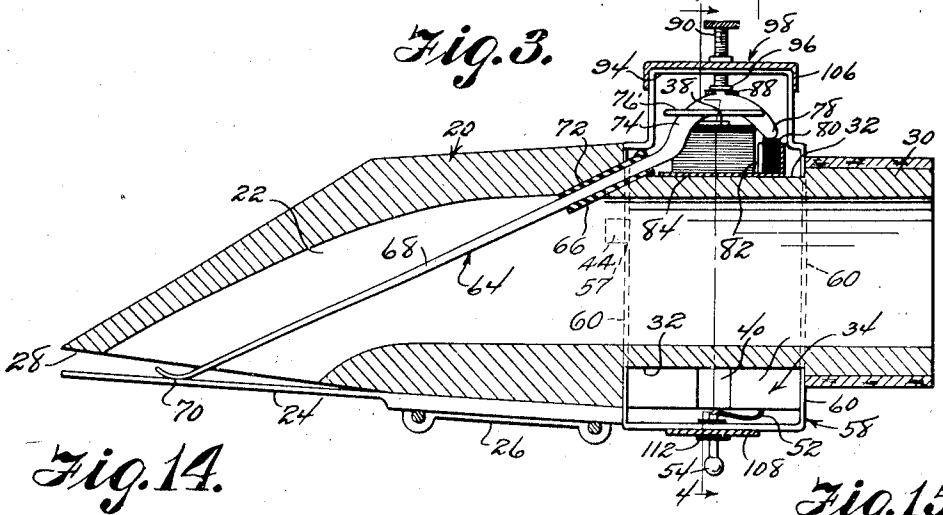


Fig. 14.

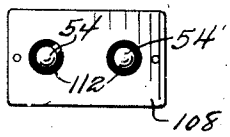


Fig. 15.

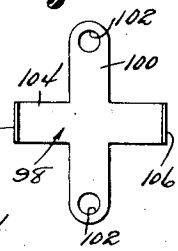


Fig. 12.

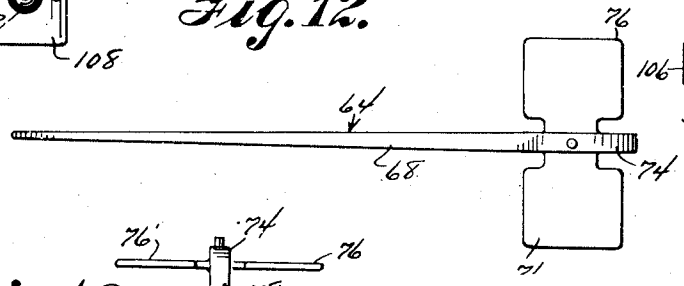
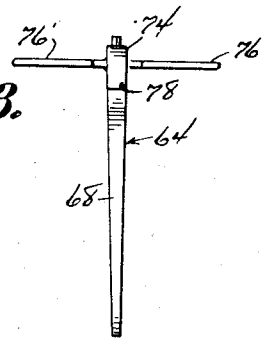


Fig. 13.



Alfred Johnson
INVENTOR.

BY
Victor J. Evans & Co.
ATTORNEYS

Aug. 28, 1945. A. JOHNSON 2,383,553

ELECTRICAL PICK-UP FOR WIND INSTRUMENTS

Filed Feb. 21, 1944 2 Sheets-Sheet 2

Fig. 4.

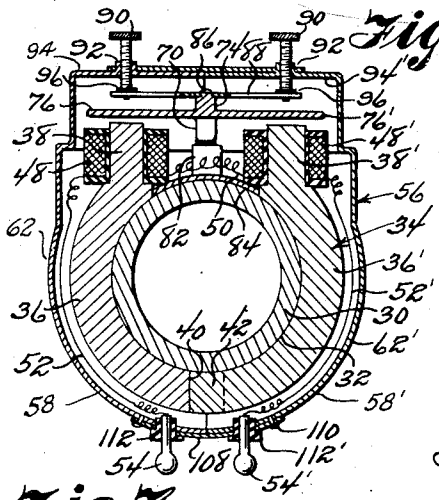


Fig. 5.

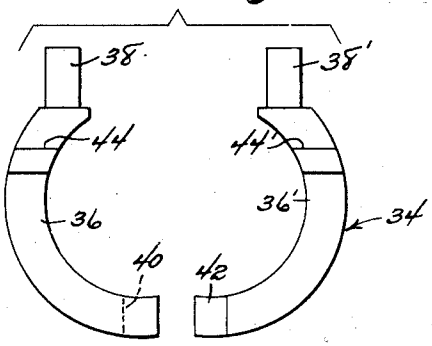


Fig. 6.

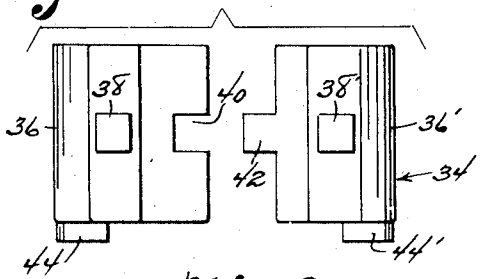


Fig. 7.

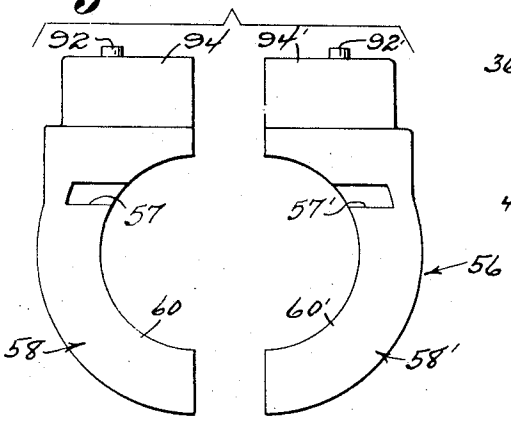


Fig. 9.

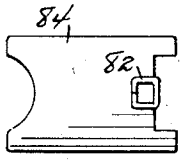


Fig. 8.

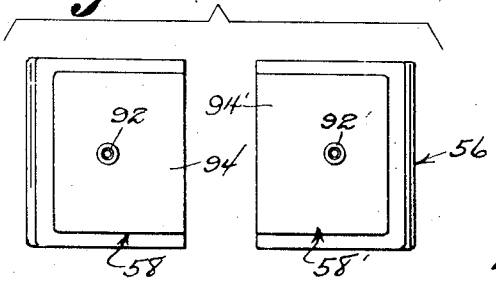
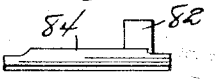


Fig. 10.



Fig. 11.



Alfred Johnson
INVENTOR.

BY
Victor J. Evans & Co.
ATTORNEYS

Patented Aug. 28, 1945

2,383,553

UNITED STATES PATENT OFFICE

2,383,553

ELECTRICAL PICKUP FOR WIND INSTRUMENTS

Alfred Johnson, Buffalo, N. Y.

Application February 21, 1944, Serial No. 523,337

10 Claims. (Cl. 84—383)

My invention relates to musical instruments of the reed type, and has among its objects and advantages the provision of an improved electrical pickup for connection with an amplifying system.

In the accompanying drawings:

Figure 1 is a side view of a mouthpiece showing my invention applied thereto.

Figure 2 of an end view of the mouthpiece viewed from the right of Figure 1.

Figure 3 is an enlarged sectional view along the line 3—3 of Figure 2.

Figure 4 is a sectional view along the line 4—4 of Figure 3.

Figure 5 is an end view of a permanet magnet comprising two sections separated for the sake of clearness.

Figure 6 is a top plan view of the structure of Figure 5.

Figure 7 is an end view of a sectional cover.

Figure 8 is a top plan view of the structure of Figure 7.

Figure 9 is a top plan view of a vibrator stabilizer.

Figure 10 is an end view of the vibrator stabilizer viewed from the right of Figure 10.

Figure 11 is a side view.

Figure 12 is a plan view of a vibrator.

Figure 13 is a combination plan and end view of the vibrator viewed from the right of Figure 12.

Figure 14 is a plan view of a terminal mount, and

Figure 15 is a plan view of a cover locking clip.

In the embodiment of the invention selected for illustration, I make use of a mouthpiece 20 such as is used in a clarinet, although the invention is equally well adapted to reed type mouthpieces employed in other types of instruments. This mouthpiece is provided with the usual air passage 22 and is provided with a reed 24 secured to the mouthpiece by a conventional plate 26. The reed 24 is in angular displacement with the face 28 of the mouthpiece 20 through which the air passage 22 passes.

The body 30 of the mouthpiece 20 is provided with a circumferential groove 32 within which is mounted a permanent magnet 34 comprising magnet sections 36 and 36'. The sections 36 and 31' provided with posts 38, 38', respectively and one section is provided with a recess 40 for the reception of a tongue 42 on the other section to restrain the two sections from relative axial displacement. The lower ends of the sections abut and the sections are provided with tongues 44 and 41', respectively, see Figure 1, which lie in recesses in the body 30 to restrain the section from rotation relatively to the body 30. One only of the recesses is shown, and designated 46.

Windings 48 and 48' are mounted on the respective posts 38 and 38', one post constituting the south pole of the magnet 34 and the other end constituting the north pole. The two windings 48 and 48' are connected by a wire 50, and the windings are connected by wires 52 and 52' leading to output prong terminals 54 and 54', respectively. These terminals provide means by which the magnetic pickup may be electrically connected with an amplifier of any well known construction (not shown).

The magnetic pickup structure is housed in a cover 56 comprising two similar sections 58 and 58'. The sections 58 and 58' are provided with end flanges 60 and 60' lying against the end faces of the groove 32, with one flange of each section bearing against one of the lugs 44, 44' to clamp its respective magnet section against the bottom face of the groove 32. To adapt them to bear against the lugs 44 and 44', the flanges 60 and 60' are provided with slots 57 and 57' as shown in Figures 3 and 7. The slots receive the lugs and the latter contact with the end walls of the slots. The annular walls 62 and 62' of the cover 56 are spaced from the magnet 34 to provide accommodation for the wires 52 and 52'.

A vibrator 64 is mounted in a resilient support 66 see Figure 3, which vibrator includes a resilient finger 68 extending into the air passage 22 and having a curved end 70 bearing against the reed 24. The support 66 preferably comprises rubber of tubular formation and is inserted through a diagonal bore 72 in the body 30. In Figures 12 and 13, the vibrator 34 includes a substantially half circular body 74 to which are fixedly connected armatures 76 and 76' lying in a common plane and slightly spaced from the respective posts or pole pieces 38 and 38', as in Figure 4. In Figure 3, the body 74 has its end 78 bearing on a resilient support 80, such as a rubber body supported in a socket 82 on a plate 84 lying against the bottom face of the groove 30 and between the spaced pole ends of the magnet sections 36 and 36'. The body 80 and its socket 82, together with the plate 84, constitute a stabilizer for the vibrator 64.

The shank 68 is preferably of one piece construction with the body 74, the body comprising soft iron which is also true of the armatures 76 and 76'. However the shank 68 is appropriately tempered for the sake of flexibility. In Figure 4,

the body 74 is provided with a pin 86 riveted to a bar 88. Adjusting screws 90 are threaded through bosses 92 and 92' on the top walls 94 and 94' of the cover sections 58 and 58'. Insulators 96 are interposed between the ends of the screws 90 and the bar 88. Thus the armatures 76 and 76' may be adjusted toward and away from the pole pieces 38 and 38' and maintained in proper alignment therewith through adjustment of the screws 92 since the resilient support 66 and body 80 provide sufficient yieldability for this purpose.

The cover sections 58 and 58' are held in assembled relationship with the mouthpiece through the medium of a clip 98 having arms 100 provided with openings 102 through which the pins 92 are projected. This clip is provided with two arms 104 lying flatwise against the walls 94 and provided with ends 106 which snap over the side faces of the sections 58 to restrain the sections from separation. Additional supporting means for the cover sections 58 comprise a plate 108, see Figure 4, which plate lies flatwise against the curved wall 62 and is detachably connected with the sections 58 by screws 110. Insulators 112 and 112' for the respective prong terminals 54 and 54' extend through the plate 108.

Vibration of the reed 24 imparts vibratory motion to the vibrator 64. The armatures 76 and 76' are therefore caused to move in the magnetic fields adjacent the two poles of the magnet 34. Thus the vibrations of the reed 24 are translated into electric oscillations through the medium of the electric pickup structure for reproduction in the amplifier circuit. The vibrator 64 may be accurately adjusted through the medium of the screws 90, both with respect to the correct alignment of the armatures 76 and the poles of the magnet 34 and for tone modifying purposes.

My invention is easily built into mouthpieces of conventional design. The instrument is played in the usual manner and does not, therefor, require the mastery of a new technique in order to play the instrument successfully. The mouthpiece is interchangeable with conventional instruments and is therefore easily substituted for the conventional mouthpiece.

Without further elaboration, the foregoing will so fully explain my invention, that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

I claim:

1. In a musical instrument mouthpiece having an air passage, the combination of a reed operatively associated with the air passage, a vibrator carried by said mouthpiece and operatively engaging said reed, a magnet having poles, connected windings on said poles, an armature fixed to said vibrator and located in the magnetic fields of said poles for translating reed vibrations into electrical oscillations for reproduction, and output terminals connected to said windings.

2. The invention described in claim 1 wherein said vibrator is resiliently mounted on the mouthpiece, and in which said armature comprises wings fixedly related to the armature and respectively lying in the magnetic fields of said poles.

3. The invention described in claim 1 wherein said vibrator is resiliently mounted on the mouthpiece, and in which said armature comprises wings fixedly related to the armature and respectively lying in the magnetic fields of said poles, and means for adjusting said wings relatively to said poles.

4. The invention described in claim 1 wherein said vibrator comprises a flexible shank and in which said armature comprises wings projecting laterally from the shank and lying in the respective magnetic fields, and resilient mounting means for the vibrator.

5. In a wind instrument of the type described, a mouthpiece body having an air passage, a reed operatively associated with said air passage, said body having a circumferential groove, a magnet comprising two sections each having a pole, a cover for said magnet and having engagement therewith for holding the sections in position in the groove, electrically connected windings on the respective poles, a vibrator resiliently mounted on said body and having a shank operatively engaging said reed, and an armature fixedly related to said shank and lying in the magnetic fields of the respective poles for translating reed vibrations into electrical oscillations for reproduction, and output terminals connected to said windings.

6. The invention described in claim 5 wherein means are provided for adjusting said armature relatively to said poles.

7. In a musical instrument, a mouthpiece body having an air passage, a reed operatively associated with said air passage, said body having a circumferential groove, a magnet mounted in said groove, said magnet comprising sections keyed one to the other and each provided with a pole, electrically connected windings on the respective poles, a vibrator comprising a shank engaging said reed and having an armature arranged in the magnetic fields of said poles for translating reed vibrations into electrical oscillations for reproduction, output terminals connected to said windings, a resilient support for said shank interposed between the latter and said body, said shank terminating in a curved end, a resilient body interposed between said curved end and said first mentioned body, a cover attached to said first mentioned body for holding the magnet in said groove, and screw means for adjusting said armature relatively to said poles.

8. The invention described in claim 7 wherein said cover is sectional, and means for detachably holding the sections in assembled relationship with said body.

9. The invention described in claim 7 wherein said armature comprises wings fixedly related to said curved end and respectively lying in said magnetic field, and adjusting screws threaded through said cover and engaging the respective wings for adjusting the latter relatively to the respective poles.

10. The invention described in claim 7 wherein said curved end and said armature are formed of soft iron, and in which said shank is tempered for flexibility.

ALFRED JOHNSON.