Jan. 16, 1940. J. WHITE 2,187,064

ARMATURE SUPPORT

Filed March 4, 1937

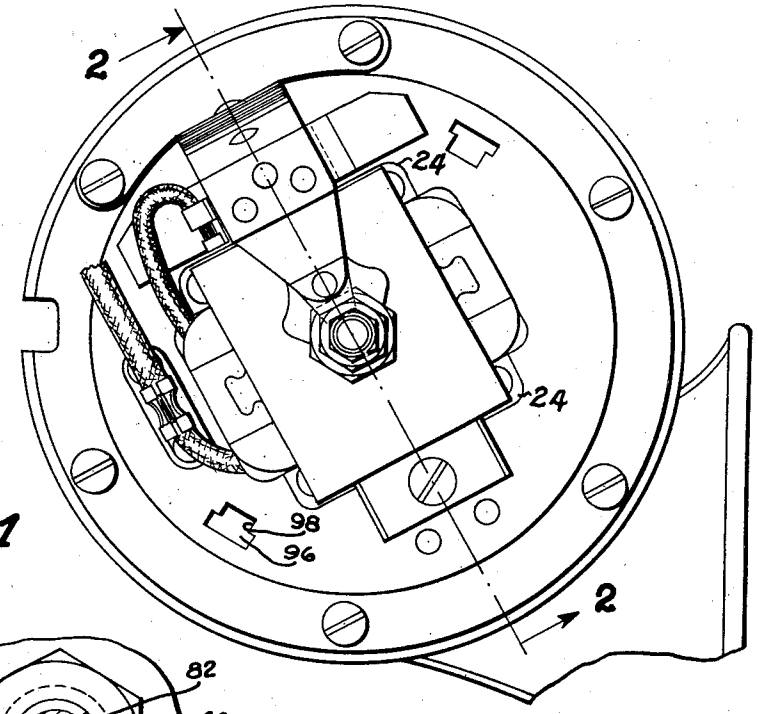


Fig. 1

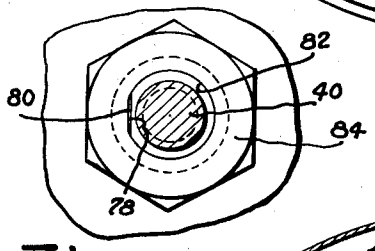


Fig. 4

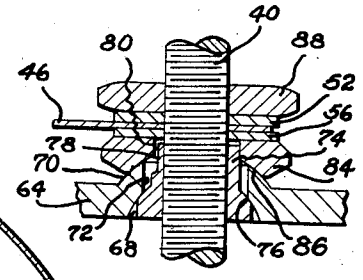


Fig. 3

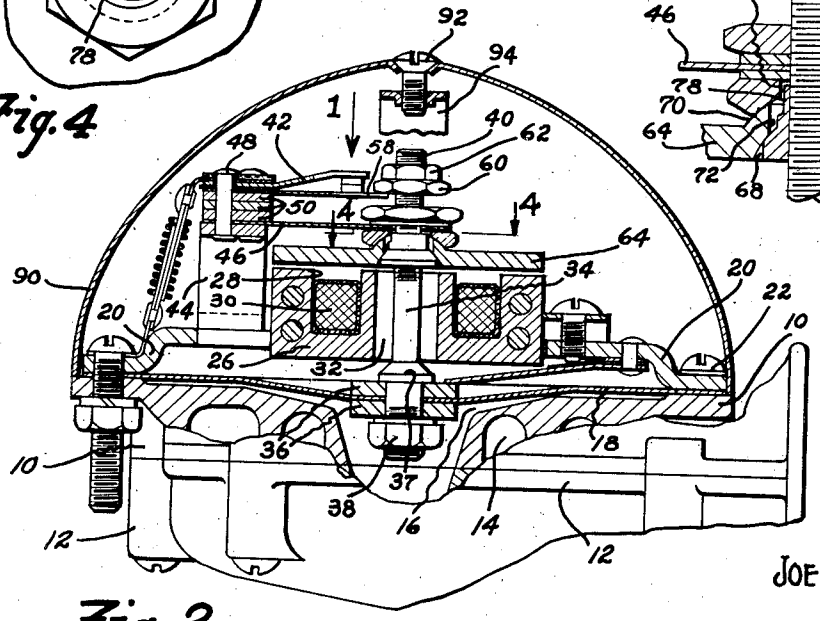


Fig. 2

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ARMATURE SUPPORT

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3 Claims. (Cl. 177—7)

This invention relates to sound signal devices of the vibratory type, and has for an object to improve supporting means for an armature in a vibration motor.

It is an object of this invention to provide an armature support that will be self aligning, and easily accessible for manual adjustment.

In sound signal devices of the vibratory type and particularly those known as air note horns, a collar member opening into an air column is disposed on the opposite side of the diaphragm from the actuating motor, and it is desired that this air column so constituted shall be in sealed relation, except for the bell of the projector, to the compression chamber on the working side of the diaphragm. In a construction of that character, having armature adjusting means, it has heretofore been necessary to provide a port through the casing or collar opposite the armature stud, by which adjustment of the air gap and armature spacing could be accomplished. It has also been necessary to provide a plug or other sealing means to close the port. It is therefore an object of this invention to provide armature adjusting means that will be readily accessible from the motor side of the diaphragm, whereby full adjustment of the armature and its air gap can be accomplished without disturbing the seal of the air column, and without disturbing the connection of the armature rod and the diaphragm.

In constructions of the aforementioned prior art devices, when making armature adjustments, it has been necessary to first remove the plug, make such adjustment as was deemed sufficient, replace the plug, and then sound the horn. If the adjustment was not correct then it was necessary to remove the plug, repeat the adjustment, and again replace the plug, before a second trial of the adjusted horn could be made. It was necessary to replace the plug each time before sounding the instrument, in order to restore the horn to actual conditions of use, so as to determine the correctness of the adjustment. It is therefore an object of this invention to provide means for armature adjusting means, that in no way disturb or interfere with the parts contributing to the definition of the air column.

These several objects have been accomplished by fashioning the armature with a centrally disposed semi-spherical like socketed aperture, and supporting it by a sleeve threaded upon the armature rod, the sleeve having a ball-like shoulder or flange for reception of the armature socket, and by providing an adjusting plate with non-rounded provisions engaging the sleeve, by which the sleeve may be turned upon the threaded stud. Any convenient cooperating means, as a lock nut, may be used for clamping the parts in adjusted position.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of the present invention is clearly shown.

In the drawing:

Fig. 1 is a top plan view of a sound signal device with the cover assembly removed, substantially as indicated by arrow 1 in Fig. 2.

Fig. 2 is a vertical section through the sound signal device, substantially as indicated by the line and arrows 2—2 of Fig. 1.

Fig. 3 is an enlarged detail view in section, illustrating the armature supporting and adjusting means.

Fig. 4 is an enlarged detail view with parts shown in section, substantially as indicated by the line and arrows 4—4 of Fig. 2.

Referring particularly to the drawing, 10 indicates a collar member cooperating with a cap 12 providing a normally closed air column 14, one end of which opens into a compression chamber 16 closed off by a diaphragm 18 clamped to the collar member 10 by a motor base 20 and screws 22.

Rigidly mounted upon the motor base 20 in any convenient manner, as by means of brackets 24, there is a magnet frame 26, notched at 28 to carry a magnet winding 30. The magnet frame is centrally apertured at 32 to allow for reciprocatory passage of an armature rod 34, rigidly connected to the diaphragm 18 by clamp washers 36, one of which engages a shoulder 37, and nut 38. The opposite end of the armature stud 34 is threaded at 40, receiving means later to be described for supporting an armature, and receiving means for actuating a circuit breaker 42. A bracket 44 is secured to the motor base 20, and supports one end of a spring 46 that guides the armature and its assembly, and also provides means for supporting the circuit breaker 42, all as is well known to those experienced in the art. Briefly, rivets 48 passed through sufficient insulators, and the circuit breaker mechanism, with spacers 50, and secure them to the bracket 44.

The armature spring 46 is apertured at its end to embrace the threaded end 40 of the armature rod, and is engaged on opposite sides by washers 52 and 56. One leaf 58 of the circuit breaker 42 extends in such close proximity to the threaded end 40 of the armature rod, as to be engaged by

a nut 60 threaded on the rod and maintained in adjusted position by clamp nut 62.

Disposed over the face of the magnet frame 26 there is an armature 64 that is fashioned at its central portion to provide an extrusion formed by a spherical recess 68 and a rounded shoulder 70 disposed about an aperture 72 somewhat larger than the cross-section of the threaded stud. Threaded upon the portion 40 of the stud there is a sleeve 74, that has a spherical shoulder 76 upon which the recessed portion 68 of the armature rests, and is capable of oscillation. For this purpose the reduced portion of the sleeve 74 is somewhat smaller in cross section than is the aperture 72 of the armature, and for that portion of the sleeve extending through the armature there is provided a flat 78 that matches with a rib 80 Fig. 4, extending across the edge of a central bore 82 of an adjusting plate 84, that in turn is recessed in a spherical sense on one side at 86 about its aperture so as to fit the rounded portion 70 of the armature.

In the order of assembly, the sleeve 74 is threaded upon the portion 40 of the stud, and is followed by the armature 64, such that the recess portion 68 rests upon the shoulder 76. Thence follows the adjusting plate 84 that is passed over the end of the sleeve 74 so that the rib 80 coincides with the flat or non-rounded portion 78 of the sleeve. Now comes the washer 56, the apertured end of the armature spring 46 and the second clamping washer 52, all of which are held in place when the proper adjustment is made, by a clamp nut 88 threaded upon the portion 40 of the stud.

With a device so constructed, adjustment of the armature upon the rod 34 is accomplished, if need be, by loosening the nut 88, and thence turning the adjusting plate 84. Turning the adjusting plate 84 upon the threaded stud 40, will also turn the sleeve 74 upon the threaded stud, and within the armature 64, and in so doing carrying the armature 64 along the threaded stud in the direction of movement of the adjusting plate 84. Upon completing the adjustment, sounding of the signal device will determine the sufficiency of the adjustment, and operation of the sound signal device will operate to line up the armature 64 with the magnet frame 26 so as to establish parallelism. The adjustment having been found to be correct or satisfactory, the clamp nut 88 is thence finally tightened to hold the parts in place, whereupon the adjustment is complete. At the conclusion of this, the storm cover 90 is replaced, and the holding screw 92 passed therethrough and threaded into the yoke 94 as is illustrated. A convenient way to support the yoke 94, and further accomplish accessibility to the armature adjustment, is to provide oppositely disposed notches at each end of the yoke so that when the ends of the yoke are passed through apertures 96 of the the motor base, the notches will engage the shoulders 98, and provide sufficient anchorage for the storm cover.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a sound signal having an oscillatable diaphragm, and a magnet frame in superposed but spaced relation, the combination comprising, an armature rod passing through an opening in the frame, an armature overlying the frame on the side opposite the diaphragm, and means universally supporting the armature from the rod, so that the armature may adjust itself into parallelism with the frame, including a ball faced sleeve threaded upon the rod, a cooperating socketed portion provided by the armature loosely embracing the sleeve, an adjusting plate non-rotatable with respect to the sleeve for varying the air space between the armature and frame, and a nut carried by the rod for securing the adjustment when accomplished, said nut being accessible only from the armature side of the frame.

2. In an armature support for a magnet motor, the combination comprising, an armature stud, a shouldered sleeve having a non-circular portion and being threaded upon the stud, an armature, a universal seat for the armature upon the sleeve shoulder, an adjusting plate surrounding one end of the sleeve and engaging the armature, said plate having non-circular provisions engaging the sleeve for altering the threaded relation of the sleeve and stud, and a clamp nut adapted to restrain relative movement between the sleeve and stud.

3. In an armature support for a magnet motor, the combination comprising, an armature stud, a sleeve providing a shoulder and having a screw threaded relation with the stud, an armature having an extrusion for seating on the sleeve shoulder and being universally oscillatable relative to the axis of the stud, said armature extrusion providing a shoulder surrounding the sleeve, an adjusting plate engaging the shoulder of the armature and providing means to thread the sleeve on the stud, and means for restraining relative movement between the sleeve and stud.

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