June 24, 1930. O. R. GRASS 1,766,992

PHONOGRAPH CONSTRUCTION

Filed May 31, 1924

Fig. 1

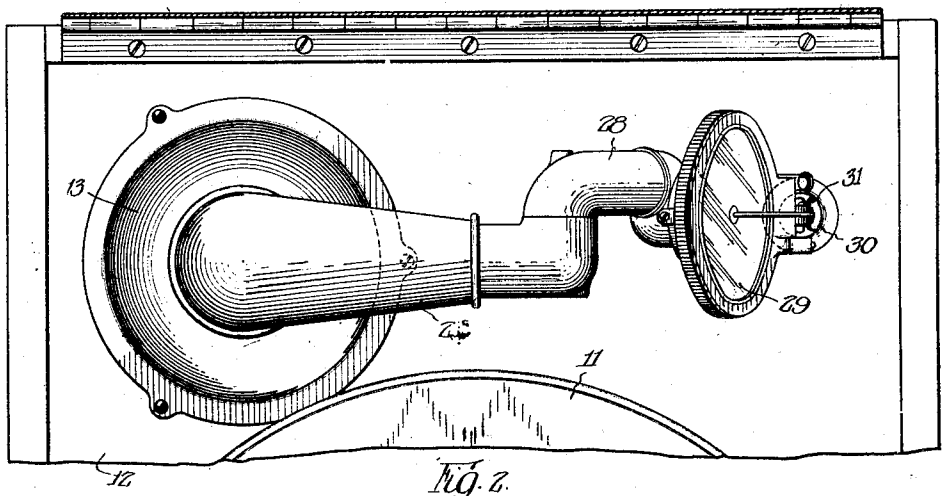


Fig. 2.

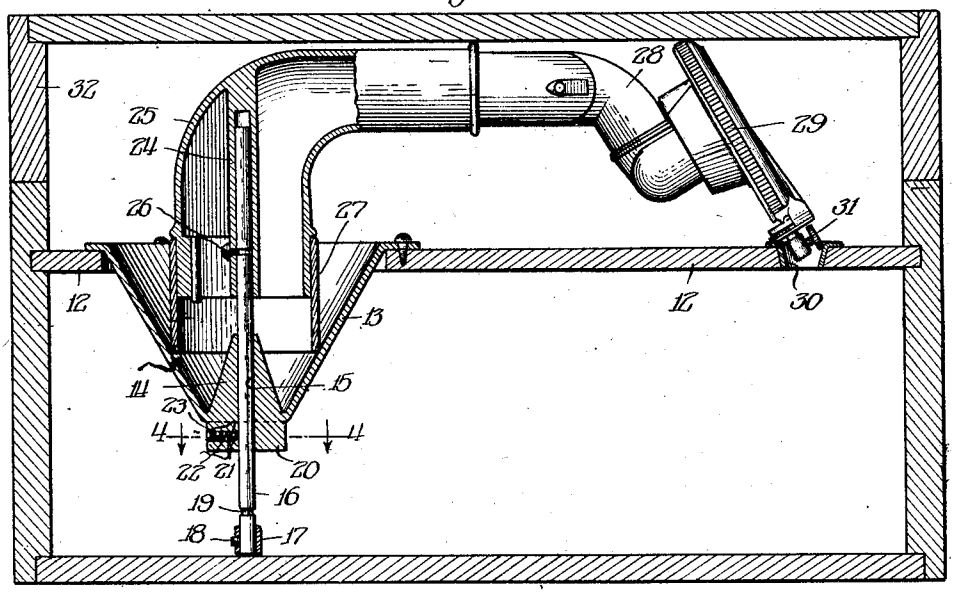


Fig. 3

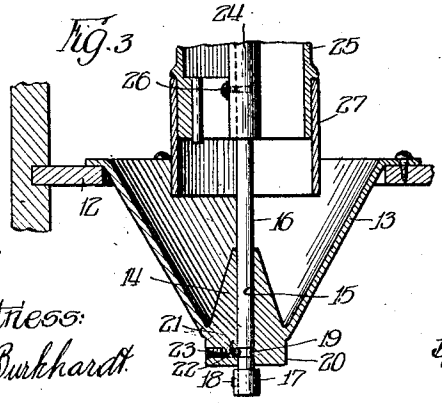
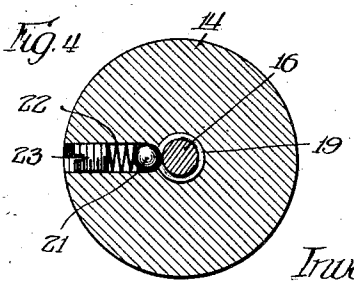


Fig. 4



Witness:
A. Burkhardt

Inventor:
Otto R. Grass,
By Wilkinson Huxley Byron & Knight
Attys.

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UNITED STATES PATENT OFFICE

OTTO R. GRASS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE ORO-TONE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

PHONOGRAPH CONSTRUCTION

Application filed May 31, 1924. Serial No. 716,898.

This invention relates to a new and improved phonograph construction and more particularly to a construction adapted for use upon phonographs of the portable type.

One of the important difficulties incident to the construction of phonographs of the portable type, consists in provision of means for retaining the tone arm and sound box in a fixed travelling position. These parts when in the operative position, take up considerable space and it has been customary to remove them and place them in a compartment for carrying purposes. Such designs are undesirable in that the construction is complicated to allow the removal and attachment and there is likelihood of the loose portion rattling around in carriage or becoming mislaid or lost.

A further usual difficulty in such construction lies in the fact that the cabinet must be enlarged to provide space for a carrying compartment for the tone arm.

It is an object of the present invention to provide a phonograph construction in which the tone arm may be readily and quickly moved from operative position to travelling position without removal from its support.

It is a further object to provide means preventing lateral movement of the tone arm when in travelling position.

It is an additional object to provide a simple sound amplifying chamber associated with such a tone arm.

It is also an object to provide a construction which is simple in design and operation, which occupies but small space and which is adapted for ready commercial production.

Other and further objects will appear as the description proceeds.

I have illustrated a preferred embodiment of my invention in the accompanying drawing, in which—

Figure 1 is a plan view of the tone arm supporting portion of the cabinet;

Figure 2 is an elevation of the part shown in Figure 1, portions being broken away to show the construction;

Figure 3 is a fragmentary view similar to Figure 2 but showing the tone arm raised to the operative position; and

Figure 4 is a section taken on line 4—4 of Figure 2.

The turntable 11 is located above the cabinet top or motor board 12 and is operated and controlled by any usual form of mechanism which forms no part of the present invention. The sound amplifying chamber 13 is secured to the member 12 and, as shown in Figures 2 and 3, is conical in shape with its wider end directed upwardly. The upwardly extending conical portion 14 is located concentrically of the member 13 and at its lower portion. This portion 14 is provided with the vertically extending opening 15 into which is fitted the tone arm supporting shaft 16.

The lower end of the shaft 16 carries the sleeve 17 held in place by set screw 18 which limits the upward movement of the shaft, as shown in Figure 3. Above the sleeve 17 the shaft 16 is provided with the circumferential recess 19. The lower portion 20 of the member 13 carries the ball 21 urged inwardly by spring 22 held in place by screw 23. The upper end of the shaft 16 is secured to the inner portion 24 of the tone arm 25 by means of the set screw 26. Tone arm 25 is provided with the downwardly extending skirt 27 which is located concentrically with the conical sound amplifying chamber 13. The tone arm 25 is connected by means of coupling 28 with the sound box 29. The sound box support or retaining member 30 is secured to the cabinet top or motor board 12.

The parts are shown in their travelling position in Figures 1 and 2. The skirt 27 engages the inner surface of the sound amplifying chamber 13 and prevents further downward movement of the tone arm. The needle receiving portion 31 of the sound box 29 is fitted into support 30, which prevents lateral movement of the tone arm. The top 32 of the cabinet is swung closed and latched and, as clearly shown in Figure 2, closely engages the top of the sound box and of the tone arm and thus prevents their vertical movement.

When it is desired to move the parts to the operative position, the lid 32 is raised

out of the way and the tone arm 25 is drawn upwardly until the sleeve 17 abuts the lower portion 20 of the member 13. The spring pressed ball 21 then engages the groove 19 and yieldingly maintains the tone arm vertically in its operative position. The sound box may be then swung over the turntable to play records in the usual manner.

When it is desired to restore the parts to the travelling position, the tone arm is swung horizontally to the position in which it is shown in Figure 1. Downward pressure is then applied to the tone arm and this unseats the ball 21 and the parts are moved to the position in which they are shown in Figure 2.

The conical sound chamber 13 serves to reflect upwardly and outwardly the sound waves which are directed downwardly into it. The reentrant conical portion 14 serves not only to support the shaft 16, but also to reflect outwardly the sound waves. This construction has been found particularly efficient and in spite of the relatively small size of the sound chamber, it affords a large volume of sound.

I claim:

1. In sound reproducing apparatus, a tone arm and sound box, a shaft extending from the tone arm, a sound amplifier and means carried by the amplifier yieldably engaging the shaft to support the tone arm in operative position and to permit the tone arm to be moved into the amplifier in inoperative position.

2. In sound reproducing apparatus, a tone arm and sound box, a shaft extending from the tone arm, a conical sound amplifier directed toward the tone arm and means carried by the amplifier yieldably engaging the shaft to maintain the tone arm in operative position, said means yielding to permit the tone arm to be moved into the amplifier to inoperative position.

3. In sound reproducing apparatus, a tone arm and sound box, a shaft extending from the tone arm, a fixed member having an opening therein slidably receiving the shaft, said shaft having a groove formed therein, and a spring pressed ball carried by the fixed member and adapted to engage the groove in the shaft to maintain the tone arm in operative position.

4. In sound reproducing apparatus, an upwardly opening conical sound amplifier having an opening centrally thereof, a tone arm, a shaft having one end thereof secured to the tone arm and the other end extending through the opening in the amplifier, and means for securing the shaft yieldingly in position in said opening, said means yielding to permit the shaft to be moved down through the opening to lower the tone arm to inoperative position.

5. In sound reproducing apparatus, an upwardly opening conical sound amplifier having an opening centrally thereof, a tone arm having a downwardly directed open end, a shaft having one end thereof secured centrally to the downwardly directed opening of the tone arm and the other end extending through the opening in the amplifier, and means for securing the shaft yieldingly in position in said opening.

6. In sound reproducing apparatus, an upwardly opening conical sound amplifier, a reentrant upwardly pointing conical portion centrally of the amplifier having an opening centrally thereof, a tone arm having a downwardly directed open end, a shaft having one end thereof secured centrally to the downwardly directed open end of the tone arm and the other end extending through the opening in the amplifier, and means for securing the shaft yieldingly in position in said opening.

Signed at Chicago, Illinois, this 26th day of May, 1924.

OTTO R. GRASS.