Aug. 24, 1943. C. E. COLE 2,327,620

EAR PROTECTOR

Filed April 13, 1942

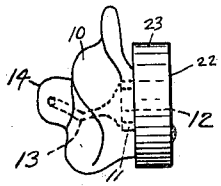


FIG. 2

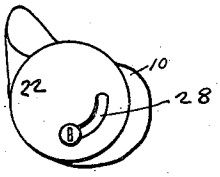


FIG. 1

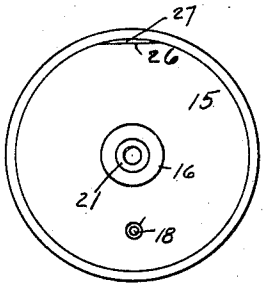


FIG. 3

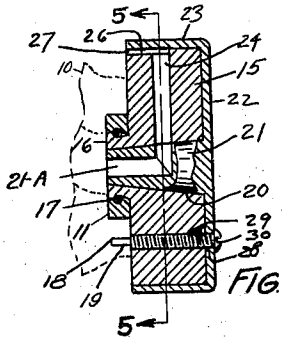


FIG. 4

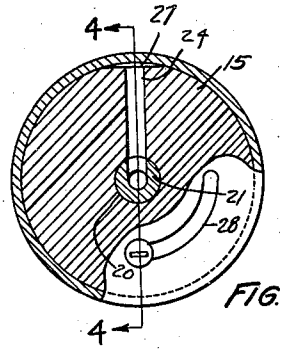


FIG. 5

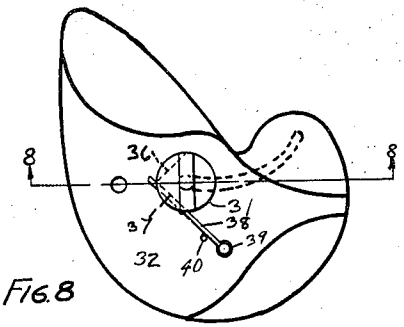


FIG. 8

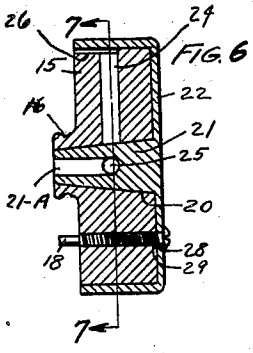


FIG. 6

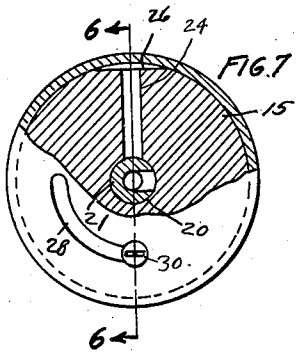


FIG. 7

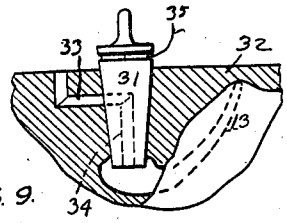


FIG. 9.

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EAR PROTECTOR

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Application April 13, 1942, Serial No. 438,724

3 Claims. (Cl. 128—151)

This invention relates generally to hearing devices, and particularly to an ear protector.

The main object of this invention is to provide a simple and highly efficient means for shutting out from the hearing mechanism of the ear, loud sounds which might otherwise be detrimental to the hearing mechanism.

The second object is to utilize an ear mold which hermetically fits the ear opening, as a means for supporting a closure which may fully or partially prevent the passage of sounds through the mold to the ear.

These and other objects are accomplished in the manner set forth in the following specification, as illustrated in the accompanying drawing, in which:

Fig. 1 is a front elevation of the device.

Fig. 2 is a side elevation of Fig. 1.

Fig. 3 is a rear elevation of the device.

Fig. 4 is a section taken along the line 4—4 in Fig. 5.

Fig. 5 is a section taken along the line 5—5 in Fig. 4.

Fig. 6 is a view similar to Fig. 4 but showing the parts in position to cut off sound.

Fig. 7 is a section taken along the line 7—7 in Fig. 6.

Fig. 8 is a plan of a modified form of the device.

Fig. 9 is a section taken along the line 8—8 in Fig. 8.

Before entering into an explanation of this invention, it must be understood that the basis thereof is the ear mold 10 shown in Figs. 1 and 2, which must be of a type made to exactly fit the ear opening of the wearer, this being usually accomplished by first making a wax impression of the ear and then forming a matrix in which is formed a plastic mold 10 which closely fits the ear opening and owing to its irregular contour, will not shake or fall out of position in the ear.

The member 10 is identical with those employed in the better types of hearing aids, and contains a metallic bushing 11 whose opening 12 is connected by the passageway 13 to the tip 14 which is inserted furthermost into the ear opening.

Referring particularly to my invention, same will be seen to consist of a circular disc 15 having a projecting button 16 adapted to snap into the bushing 11 thereby retained by the spring 17.

In order to hold the member 15 against rotation with relation to the member 10, a screw point 18 is embedded in the member 15 and fits loosely into an opening 19 in the member 10.

Extending axially through the member 10 is a tapering recess 20 in which is disposed a plug 21 which is integral with the cover 22 whose cylindrical portion 23 extends around the side of the disc member 15.

In the member 15 is formed a radial opening 24 which connects with the opening 25 in the plug 21 which in turn connects with the opening 21—A which extends along the axis of the plug 21. The member 15 is provided with a flattened side 26 at the outer end of the opening 24 to form a laterally extending passageway 27 through which sounds may enter and pass through the openings 24, 25 and 21—A into the ear when the parts are in the position shown in Figs. 4 and 5.

The cover 22 is provided with an arcuate slot 28 through which extends the body 29 of the screw 30 which thus serves to limit the relative movement of the member 21 and also to retain the plug 21 in position in its opening.

It will be understood that the illustrations made in Figs. 3 to 7 are very much enlarged for the purpose of better illustrating the invention.

The operation of the device is as follows:

When an artillery man, for example, or anyone desiring to protect his ears against extremely loud noises, wishes to do so, he has merely to turn the member 22 to the position shown in Fig. 6, thereby making it impossible for sounds to travel to the ear. He does this merely by rotating the member 21 and when he wishes to increase his ability to hear, he merely turns the member 21 toward the position shown in Fig. 4.

In the form of the device shown in Figs. 8 and 9, the valve plug 31 is fitted directly in the ear mold 32 and the canal 33 connects the passageway 34 of the plug 13 with the exterior of the ear mold. In this case a groove 35 is formed around the plug 31 and the groove 35 is provided with flat areas 36 and 37 against which bears the spring 38, one end of which is secured by the screw 39, and the intermediate portion of which is held by the pin 40.

The purpose of this construction is simply to insure the plug 31 being in either closed or open position. The operating key or handle 41 is formed on the outer end of the plug 31.

While it is a well known fact that it has been a common practice to insert plugs into the ear openings, such expedients are not entirely satisfactory as they do not completely fit the ear owing to its irregular shape, but with my device, an easily operable valve is provided which hermetically controls the ear opening, and this valve

is capable of being operated in any position from the wide open to the fully closed positions. I am aware that many modifications may be made in the details of the construction without departing from the spirit of this construction. I therefore do not intend to be limited to the precise forms shown herein, but intend to cover all such forms as fall fairly within the appended claims.

I claim:

1. The combination of an ear mold hermetically fitted into a given ear opening, said mold having a snap ring connection therein, a valve base mounted on said mold having a snap ring projection formed thereon adapted to occupy the snap ring connection on said mold, means for preventing the rotation of said base on said mold, a valve mounted in said base adapted to control the flow of sound waves to said mold, and stop means for limiting the positions of said valve in wide open and fully closed directions.

2. An ear protector consisting of a cylindrical base having a snap-on projection adapted to permit the mounting of said base on an ear mold, and having a tapering valve seat formed along the axis thereof extending through said projection, a valve plug occupying said base, said base and plug having radial openings formed therein adapted to register in one position of said plug, and to be out of register in another position of said plug, and means for rotating said valve plug having limit stops in the wide open and fully closed positions.

3. In a device of the class described, a cylindrical base having a snap-on projection on one side thereof along the base axis and having a tapering valve seat formed therethrough with the small end extending into said snap-on projection, a valve plug occupying said seat, a cap attached to said plug and extending around the edge of the base, said base and valve plug having radial openings therein adapted to register with each other or to be turned out of registering position, said base having a passageway for sound waves formed therein along the outer end of a radial opening in the direction of the snap-on side of the base.

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