July 24, 1928. 1,678,223

T. HUTNIKOW

SOUND PRODUCING DEVICE

Filed Nov. 30, 1925

Fig. 1

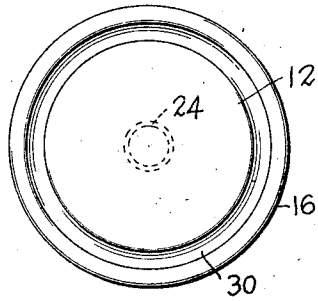
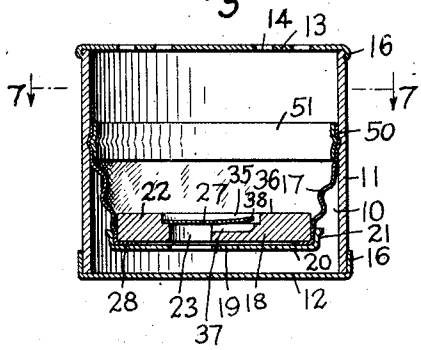


Fig. 6



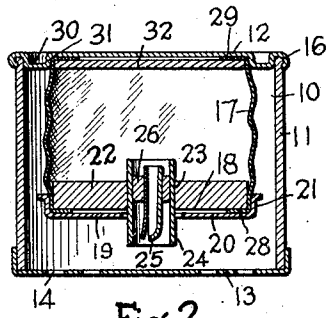


Fig. 2

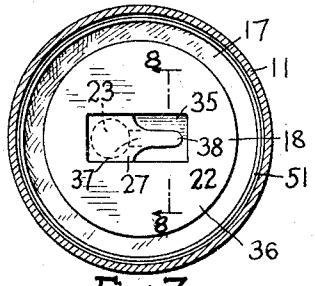


Fig. 7

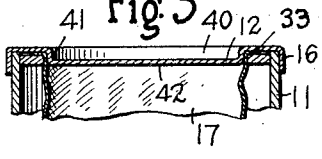


Fig. 3

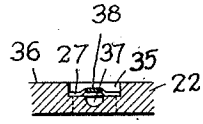


Fig. 8

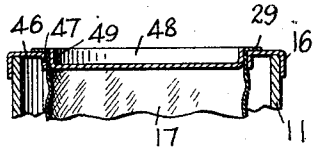


Fig. 4

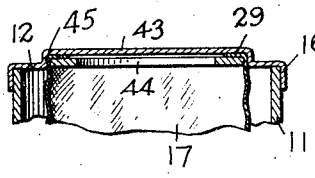


Fig. 5

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UNITED STATES PATENT OFFICE.

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SOUND-PRODUCING DEVICE.

Application filed November 30, 1925. Serial No. 72,098.

This invention relates to sound producing devices to be used in connection with toys, such as dolls and the like, and relates particularly to that type of such devices as employs a flexible bellows operated by the movement of a weight whereby air is forced through a sound producing reed. My invention contemplates particularly the provision of improved means for holding the fixed end of the bellows in place.

The various objects of the invention will be clear from the description which follows and from the drawings, in which,

Fig. 1 is a top plan view of a sound producing device embodying my invention.

Fig. 2 is a vertical section of the same showing one form of the means for securing the end of the bellows in fixed position.

Figs. 3, 4 and 5 are similar views of the fixed ends of the bellows showing modified forms of construction designed to fix the end of the bellows in place.

Fig. 6 is a similar view showing a modified form of my invention wherein the end of the bellows is held intermediately of the ends of the casing.

Fig. 7 is a horizontal section of the same taken on the line 7—7 of Fig. 6, and

Fig. 8 is a partial vertical section on the line 8—8 of Fig. 7 showing the arrangement of the reed and sound openings therefor.

In the practical embodiment of my invention I employ the usual casing 10 comprising a preferably cylindrical wall 11 made of any suitable material, such as cardboard or the like, and preferably closed at the ends thereof by the plates 12 and 13, one of which has suitable openings therein as 14 for the passage of air as will be clear from what follows.

The covers 12 and 13 are preferably made of sheet material, such as metal and are secured to the wall 11 in any suitable manner as by bending over the rims 16 thereof and forcing said rims into close contact with said wall near the ends thereof or by merely flanging said rims, if desired. A preferably flexible bellows 17 of the usual type is provided, said bellows being made preferably of rubberized fabric in the usual manner.

The movable sound producing head 18 substantially closes the movable end of the bellows and comprises an outer member as 19 having a flat surface 20 thereon and a flanged rim as 21 bent from said member substantially at right angles to said surface 20. The inner member 22 is made of suitable heavy material, such as metal, and is of such size and shape as to allow a forced fit between said member 22 and the inner surface of the flange 21. A suitable opening as 23 is formed in the members 20 and 22 into which may be inserted the tube 24, (Fig. 2) which carries a suitable sound producing reed as 25. Said reed is preferably mounted in a washer as 26 which prevents passage of air through the tube 24 excepting as said air is forced through the reed 25. The bellows end 28 is frictionally clamped into place between the members 20 and 22 when said members are forcibly assembled.

In that modification of my invention shown in Figs. 6, 7 and 8, the tube 24 is dispensed with, but over the opening 23 is mounted a flat reed 27, preferably of substantially flat sheet material, in such a manner as to cause a sound when the air passes through the opening 23 in the proper direction. A depression 35, larger than the opening 23 is made in the interior surface 36 of the head 18, into which the reed 27 is forced and maintained. A substantially semi-cylindrical opening 37 is made directly underneath the narrowed vibratory end 38 of the reed, which opening communicates with the main opening 23, whereby air passes through the openings 23 and 37 to produce sound by vibrating said end 38.

It will be seen that on the expansion and collapse of said bellows 17, air moving into or out of said bellows passes through the opening 23, and that the reeds or sound producing members may be arranged so as to cause the moving air to produce a sound in its passage in either direction.

The fixed end 29 of the bellows is secured in place to the closure member 12 and in spaced relation to the ends of the casing by means of a clamping ring or disc. Referring particularly to Fig. 2, the closure member 12 is formed with a preferably U-shaped channel as 30 therein, the wall 31 of which is made of sufficient height to receive the disc or washer 32. The end 29 of the bellows having been arranged in contact with the inner surface of said wall 31, the disc 32 is forced into place, frictionally clamping said end 29 in position. It will be understood that the diameter of the disc 32 is such as to allow a forced fit between the outer wall

of said disc and the inner surface of said wall 31.

In that form of closure member shown in Fig. 3, the end 33 of the bellows is preferably out-turned and the closure member is formed with a depressed central portion 40 whereby a substantially cylindrical wall 41 is formed. The inner surface of the ring or washer 42 engages the outer surface of wall 41 and clamps the end 33 of the bellows frictionally therebetween. In Fig. 5, the central portion 43 of the member 12 is upraised and the washer 44 is forced inside of the inner cylindrical surface of the wall 45 with the bellows end therebetween. In Fig. 4, the central portion of the closure member 46 is entirely omitted and the inner peripheral portion thereof is depressed to form the cylindrical wall 47. In place of the ring or washer I prefer in this construction to employ a cup-shaped member 48 having a wall 49 adapted to be forced inside of the wall 47 with the bellows end held therebetween.

Referring to Fig. 6, instead of spacing the fixed end 50 of the bellows inwardly of the end 16 of the casing, said end is spaced intermediately of the ends of said casing and preferably near the middle thereof. By reason of this arrangement, I am enabled to use a bellows much shorter than that which would ordinarily be required, that is, substantially half the length of the casing. The end 50 of the bellows is fixed in position by means of the cylindrical ring 51, the outer diameter of which is substantially equal to the inner diameter of the casing. Said ring fits the casing tightly enough to hold the bellows end 50 frictionally therebetween, but, if desired, the ring may be forced into the material of the casing to a slight extent as by means of the crimp or bead 52 to insure that no relative movement can take place. By means of the construction just described, the bellows head is allowed to move completely past the ring 51 on the collapse of the bellows and back past said ring again in the expansion of the bellows.

It will be seen that I have provided structure for efficiently fixing one end of the bellows in place independently of and in spaced relation to the ends of the casing, and that said structure, including as it does a pair of substantially cylindrical walls of substantially the same diameter, forms a simple and economical means for clamping the flexible bellows end therebetween.

It is not intended that this invention be limited to the specific structure shown, as said structure is merely illustrative of my invention, and it will be obvious that many changes therein may be made within the scope and spirit of this invention and falling within the range of equivalents included in the appended claims.

I claim:

1. In a sound producing device, a cylindrical casing of uniform diameter, a flexible tubular bellows wall within said casing having an open end fixed to the inner face of the casing wall intermediate the ends thereof, a weighty head closing the other end of said tubular wall and movable through the open end thereof to positions adjacent the opposite ends of the casing, and a sound producing element operated by a flow of air in the movement of said weighty member.

2. In a sound producing device, a cylindrical casing of uniform diameter, a flexible tubular bellows wall within said casing having an end thereof extending longitudinally on the inner face of the casing wall intermediate of its ends, means for fixedly attaching said end of the tubular bellows wall to the casing wall at a point intermediate the ends thereof, a weighty head of appreciably less diameter than the internal diameter of the casing closing the other end of said tubular bellows wall and movable by gravity through the first named end thereof to opposite sides of the point of attachment of said tubular wall to the casing wall, and a sound producing element operated by a flow of air in the movement of said weighty member.

3. In a sound producing device, a casing, a bellows within said casing having a flexible tubular wall provided with a weighty gravity movable head at one of its ends, the other end of said tubular wall being open and extending longitudinally upon the inner surface of the casing wall at a point intermediate the ends thereof, and an attaching member coacting with said latter end of the tubular wall and permanently securing the same to the casing wall, said attaching member permitting of the folding of the flexible wall upon itself and the movement of said weighty head from a position at one side thereof to a position at the opposite side of said member, and a sound producing element operated by a flow of air in the movement of said weighty member.

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