March 19, 1957 G. WINTRISS 2,785,507

ONE-PIECE PNEUMATIC SOUND MAKER WITH VIBRATING REED

Filed Feb. 24, 1953

Fig. 1

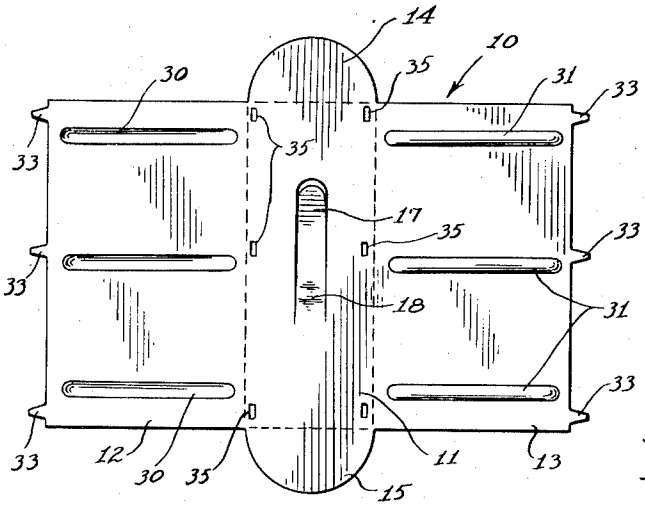


Fig. 2

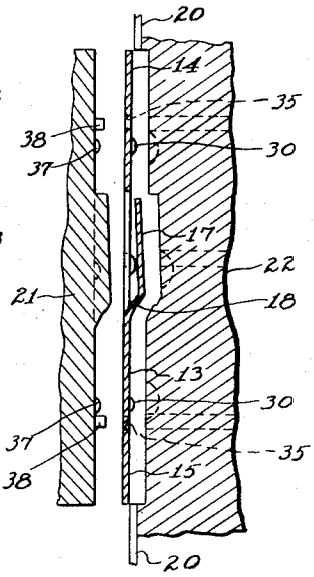


Fig. 3

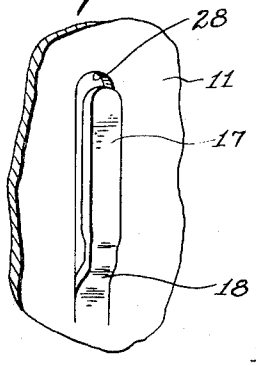


Fig. 4

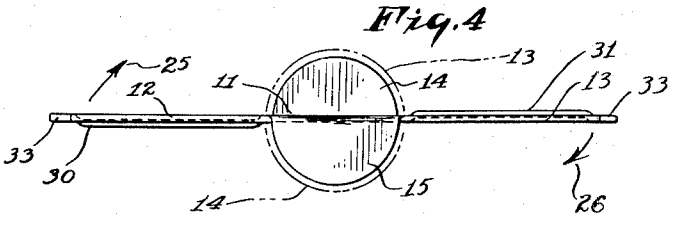


Fig. 5

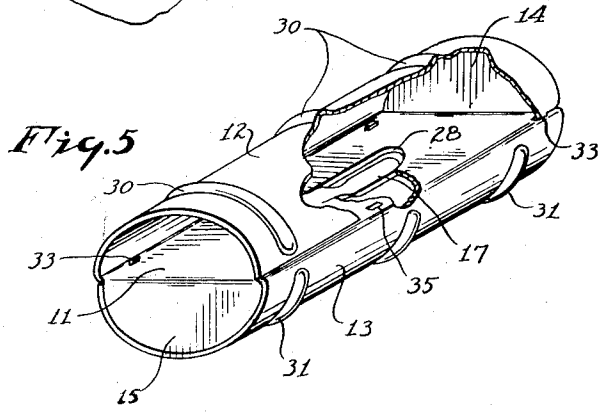
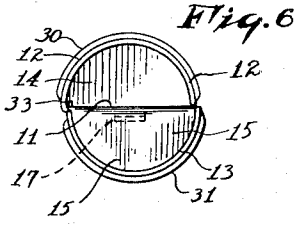


Fig. 6



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ONE-PIECE PNEUMATIC SOUND MAKER WITH VIBRATING REED

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Application February 24, 1953, Serial No. 338,226

9 Claims. (Cl. 46—180)

This invention relates to pneumatic reed noise makers such as are used with horns, rubber toys, and other articles, for producing noise when air moves into or out of the article. Such noise makers are commonly referred to as "voices."

It is an object of the invention to provide an improved construction and method of manufacturing reed noise makers of this character so as to reduce their cost. This is particularly important in the case of toys so that reed noise makers can be used with low cost toys.

One feature of the invention relates to the construction of the noise maker, including the vibrating reed, from a one-piece blank, and another feature relates to the punching of the blank and the striking of the reed in a single operation.

Other objects, features and advantages of the invention will appear or be pointed out as the description proceeds.

In the drawing, forming a part hereof, in which like reference characters indicate corresponding parts in all the views;

Figure 1 is a plan view of a blank and reed embodying this invention,

Figure 2 is a side elevation of the blank shown in Figure 1, with the punching and forming dies shown diagrammatically,

Figure 3 is an enlarged, perspective view of the reed and the portion of the blank immediately surrounding the reed,

Figure 4 is an end view of the blank shown in Figure 1, but with the opposite end sections bent upwardly, and downwardly, respectively,

Figure 5 is a perspective view, partly broken away and in section, showing the completed pneumatic noise maker of this invention, and

Figure 6 is an end view of the structure shown in Figure 5.

The blank **10** shown in Figure 1 is punched from sheet metal stock which may be brass, steel, or other material depending upon the nature of the noise maker which is to be constructed from the blank. Brass is commonly used, with a thickness of from 0.002 to 0.010 inch. Thicknesses of about 0.005 inch are well suited for most pneumatic noise makers of the kind to which this invention relates.

The blank **10** includes a main panel **11** and side panels **12** and **13** which extend from opposite sides of the main panel. There are end sections **14** and **15** extending from opposite ends of the main panel **11**. A reed **17** is struck from the main panel, preferably at a center region of the main panel. This reed is punched from the sheet on three sides but one end is left connected to the panel **11**. The position of the reed **17** with respect to the panel is best shown in Figure 2.

The portion of the reed near its connection to the panel, which portion may be referred to as the "neck" **18** of the reed, is preferably of reduced thickness so as to make the reed vibrate more freely. This reduced thickness of

the neck **18** is obtained by coining the reed at the neck, the amount of coining being determined by the intended pitch of the noise maker.

In order to reduce the manufacturing cost to a minimum, the blank **10** is punched from sheet stock **20**, between dies **21** and **22**, and the reed **17** is struck from the blank and coined in the same operation and by the same dies **21** and **22** that punch the blank from the sheet stock.

The end section **14** is bent upwardly and the other end section **15** is bent downwardly, as shown in Figure 4. The side panel **12** is then bent upwardly as indicated by the arrow **25**, and is arched across the top of the main panel **11** as indicated by the dot-and-dash lines. The other side panel **13** is bent downwardly, as indicated by the arrow **26** and is arched under the main panel **11** into the position indicated by dot-and-dash lines.

This produces the construction shown in Figure 5. The panels **12** and **13**, together with the end sections **14** and **15**, form a housing in which the main panel **11** is a partition. The panel **12**, arched across the top of the main panel **11**, forms a tunnel for air which passes the reed **17** and through the opening **28** which is formed by the striking out of the reed. This tunnel is closed at one end by the end section **14**. A similar tunnel under the main panel **11** is formed by the panel **13** and this lower tunnel is closed at one end by the end section **15**.

In order to obtain this construction, it is necessary that the side panels **12** and **13** be wider than the main panel **11** so that when the side panels are bent across the main panel, they contain enough material to form an arch with clearance under it for the passage of air. In order to have the end sections **14** and **15** close the tunnels formed by the side panels **12** and **13**, it is necessary that the free edges of each of the end sections **14** and **15** have a length equal to at least the width of the side panels **12** and **13**. The end sections can be larger than this, but the resulting construction is not so neat or compact as that disclosed in the drawing.

In order to make the invention with metal that is springy, corrugations **30** and **31** are formed in the panels **12** and **13**, respectively, at the time that the blank is cut out between the dies **21** and **22**. In the construction illustrated, there are three corrugations in each of the panels **12** and **13**, but a different number can be used, depending upon the length of the panels and springiness of the metal.

Another expedient that is used, when constructing the invention of springy metal, is the provision of prongs **33** along the outer edges of the panels **12** and **13**. Slits **35** are formed in the main panel **11** in position to receive the prongs **33** of the side panels **12** and **13**. For example, when the panel **12** is bent upwardly and arched over the top of the main panel **11**, the prongs **33** extend into the slits **35** on the right-hand side of the main panel **11**. Similarly, when the side panel **13** is bent downwardly and arched under the main panel **11**, the prongs **33** project upwardly through the slits **35** on the left-hand side of the main panel **11**.

Ridges **37** and punches **38** on the die element **21** project into the complementary depressions in the other die element **22** to form the corrugations **31** and slits **35**.

Since the effort of the arched panels **12** and **13** to spring back to bends of longer curvature is not a straight upward pull on the prongs **33**, it has been found unnecessary to bend these prongs over in order to have them effectively hold the arched-over panels in place. Friction of the prongs **33** against the slits **35** is sufficient to hold the arched-over panels in the positions shown in Figures 5 and 6. After the sound maker is mounted in a toy or other device with which it is to be used, it is always located in a holder, and this holder prevents

any subsequent opening up of the arched panels 12 and 13, regardless of vibration or other working conditions to which the invention may be subject.

For special installations, the invention can be made with only one side panel, and modifications of the invention can be made with the side panels bent to shapes other than circular, and with the end sections polygonal. Terms of orientation are, of course, relative and various changes and modifications can be made without departing from the invention as defined in the claims.

I claim:

1. A pneumatic sound maker blank including a main panel with a reed made of material from the main panel and still connected with the main panel at one end of the reed, side panels extending from opposite sides of the main panel, each of the side panels being substantially wider than the main panel for bending in opposite directions into positions arching across the main panel to form air passages on opposite sides of the main panel and the reed, and end sections extending from opposite ends of the main panel, the section at one end of the main panel being of a size when bent downwardly to close the end of the space between the main panel and an arched side panel arched across the under side of the main panel, and the section at the other end of the main panel being of a size when bent upwardly to close the end of the space between the main panel and an arched side panel arched across the upper side of the main panel.

2. The method of making a pneumatic sound maker which comprises forming a one piece sheet metal blank with a main panel and a side panel extending from at least one side of the main panel, striking a reed from the main panel, leaving the reed connected with the sheet metal blank at one end of the reed, and thereafter bending the side panel upwardly and arching it across the main panel to form a tunnel for air across a surface of the main panel from which the reed is struck.

3. The method of manufacturing a pneumatic sound maker as described in claim 2, characterized by punching the blank from sheet stock and striking the reed from the main panel in the same operation that punches the blank from the sheet stock.

4. The method of manufacturing a pneumatic sound maker as described in claim 2, characterized by punching the blank from sheet stock and striking the reed from the main panel in the same operation that punches the blank from the sheet stock, and further characterized by coining the reed near its connection with the main panel and in the same operation that punches the blank from the sheet stock.

5. The method of making a pneumatic sound maker which comprises punching, from sheet stock, a one piece blank having a main panel, side panels extending from opposite sides of the main panel and of greater width than the main panel, and end sections extending from opposite ends of the main panel with the free end of each of the end sections a curved edge having a length substantially equal to the width of one of the side panels, and striking a reed from the material of the main panel with one end of the reed still connected to the panel, the striking of the reed being performed in the same operation as the punching of the blank from the sheet stock, and thereafter bending one side panel upwardly and arching it across the main panel to form a tunnel for air across the surface of the main panel from which the reed is struck, similarly bending the other side panel downwardly and arching it across the under side of the main panel to form a tunnel for air, and bending one end section upwardly and the other end section downwardly to close the different tunnels at different ends of the sound maker.

6. A pneumatic noise maker comprising a sheet metal main panel with a reed made from the material of the main panel and still connected with the main panel at one end of the reed, two side panels, one of which is of one-piece construction with each side edge of the main panel, one of the side panels being arched over the top surface of the main panel, and the other of said side panels being arched under the surface of the main panel, circumferentially extending corrugations in the sheet metal in both of the arched side panels for stiffening the arched panels against opening up of the arched form of the panels.

7. A one piece sheet metal, pneumatic sound maker including a main panel with side panels on opposite sides, one of the side panels extending upwardly from its juncture with the main panel and then in an arch over the main panel to the other side of the main panel to form an air passage over the main panel, and the other side panel extending downwardly from its juncture with the main panel and then in an inverted arch under the main panel to the other side of the main panel to form an air passage over the main panel, and a reed made of the sheet metal of the main panel and connected with the main panel at one end of the reed between the air passages, the reed being of one piece construction with the main panel and the other parts of the sound maker.

8. The sound maker described in claim 7 with end sections extending from opposite ends of the main panel and large enough to close the end of the space between the main panel and the arched side panel, one of the end sections extending upwardly and the other end section extending downwardly.

9. A pneumatic sound maker comprising a single piece of sheet metal having a main panel, a reed made of the sheet metal of the main panel and separate from the main panel except at one end of the reed, the end of the reed adjacent its connection with the main panel being of reduced thickness to increase the flexibility of that end of the reed, side panels extending from opposite sides of the main panel, one of the side panels extending upwardly from its juncture with the main panel and then in an arch across the top of the main panel to form an air passage on one side of the main panel, and the other side panel extending downwardly and then in an inverted arch under the main panel to form an air passage on the other side of the main panel.

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