Jan. 17, 1956 J. H. BACON 2,730,920

MUSICAL WHISTLE

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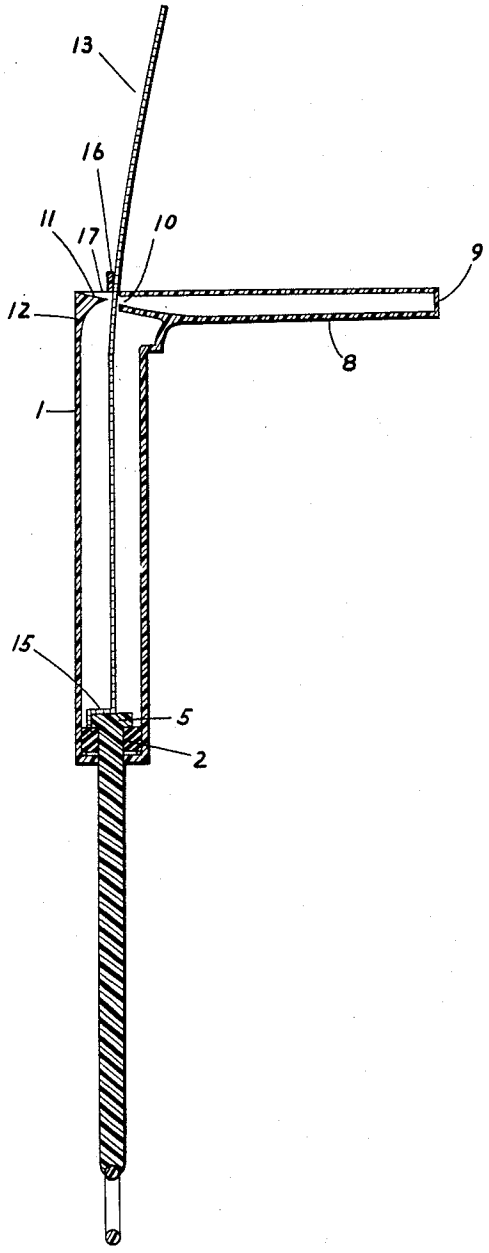


FIG. 2

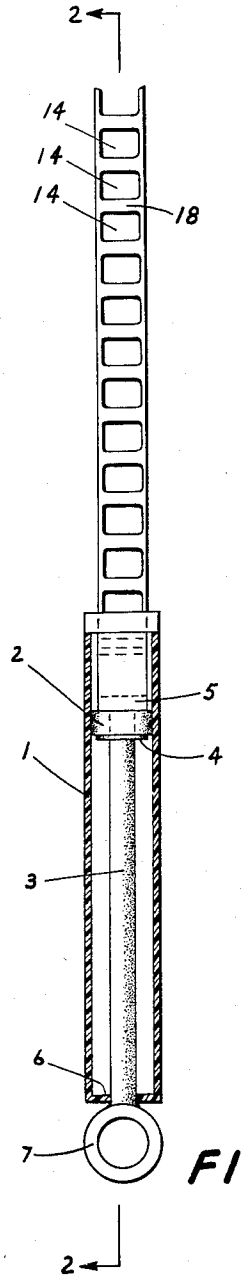


FIG. 1

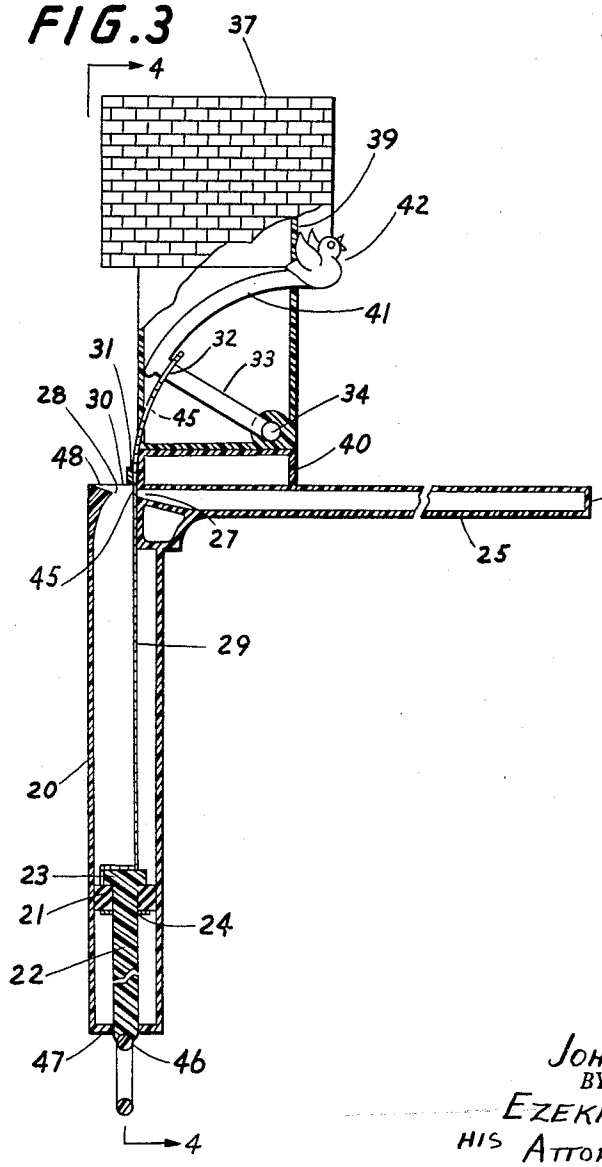
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MUSICAL WHISTLE

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FIG. 3



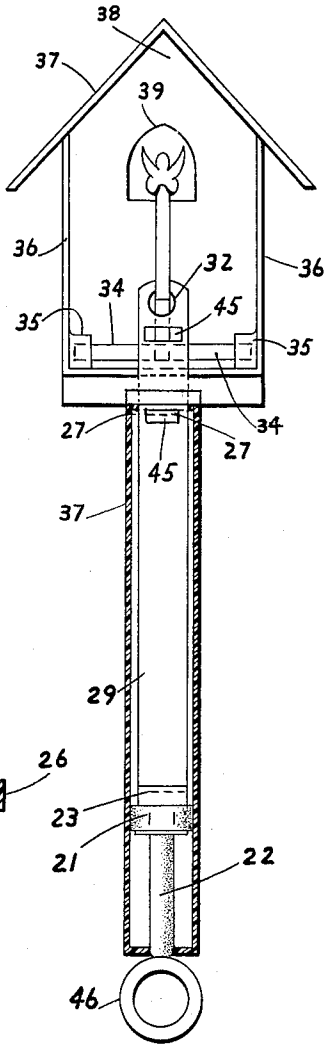


FIG. 4

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MUSICAL WHISTLE

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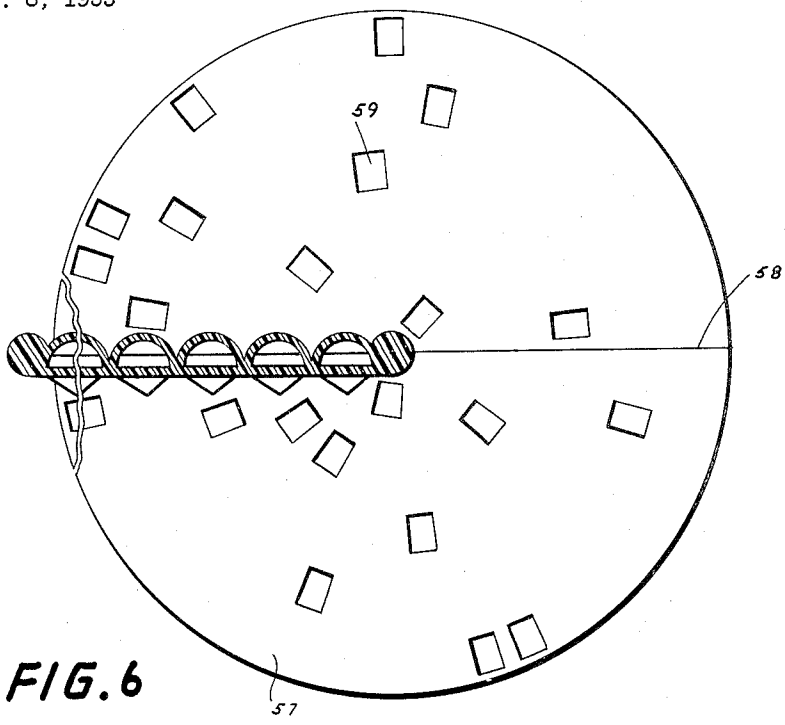


FIG. 6

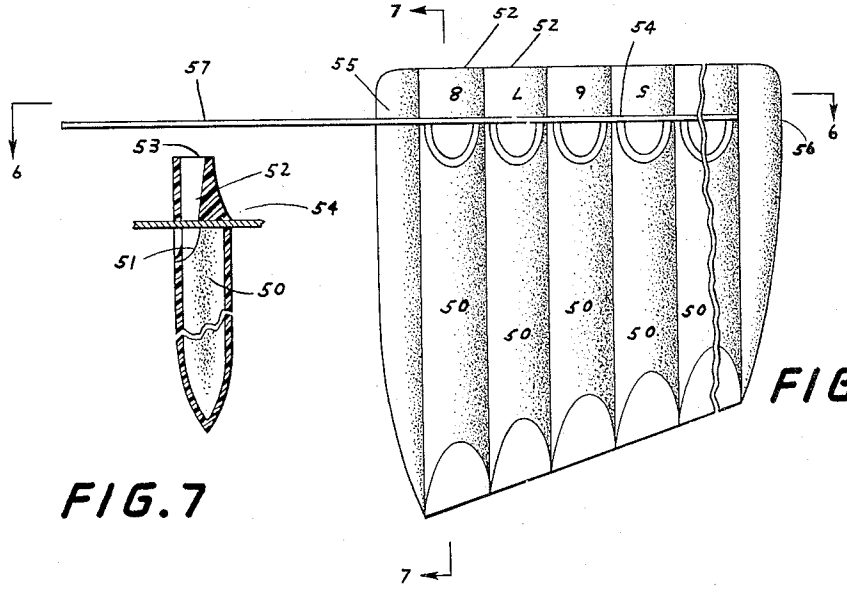


FIG. 7

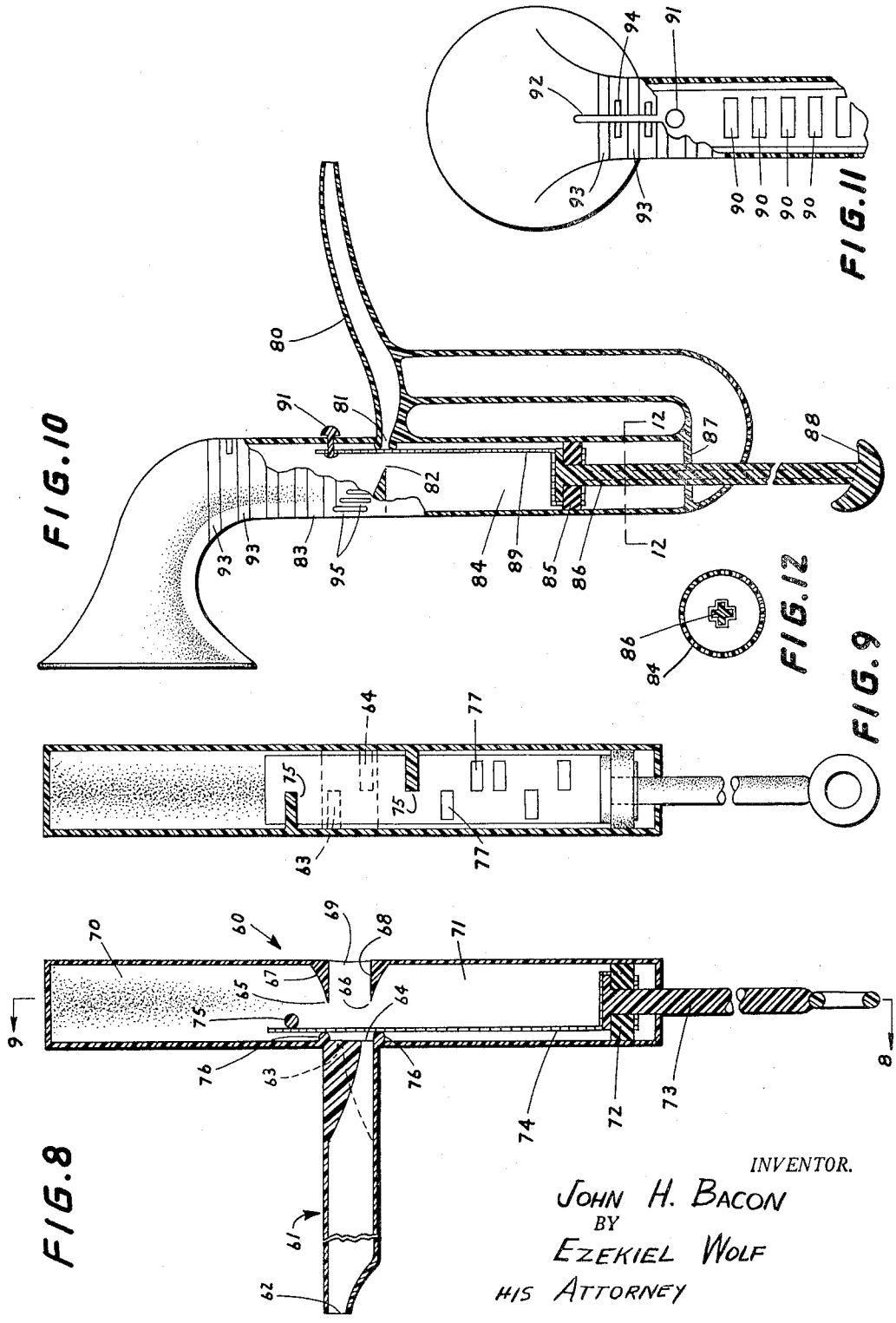
FIG. 5

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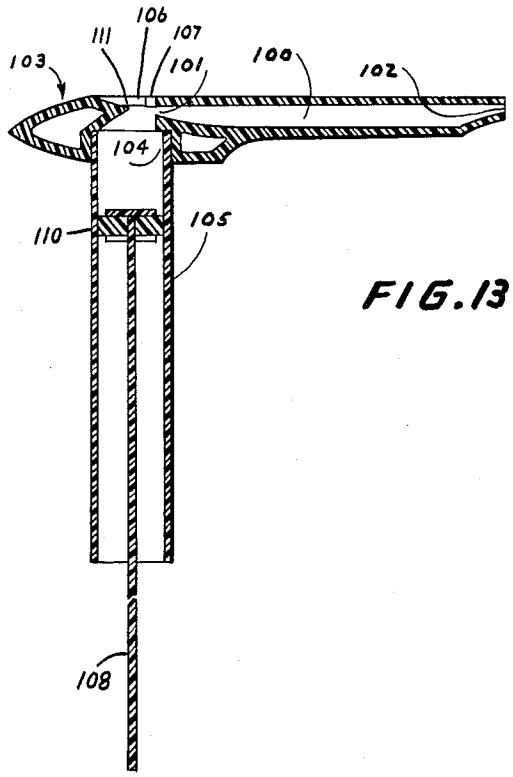


FIG. 13

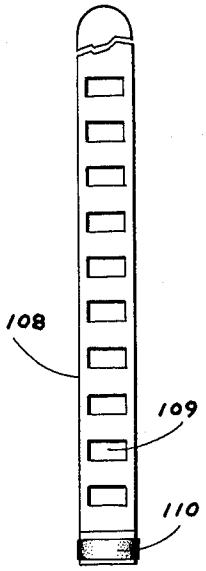


FIG. 15

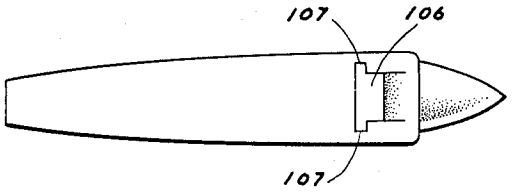


FIG. 14

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2,730,920

MUSICAL WHISTLE

John H. Bacon, Wellesley Hills, Mass.

Application February 8, 1955, Serial No. 486,815

20 Claims. (Cl. 84—380)

The present invention relates to a whistle capable of playing a specific note over selected periods of time.

It is an object of the present invention to provide an inexpensive mouth operated whistle capable of playing specific and selected notes for selected periods of time. In this connection it is further an object of this invention to provide means within the whistle for permitting selected notes to be distinctly played at spaced time intervals even though the operator continues to blow into the whistle between the sounding of successive notes.

It is further an object of the invention to provide means within the whistle whereby selected notes may be played for desired time intervals and further to provide means by which notes may be played in a preselected order.

Another object of this invention is to provide means for deflecting the flow of air from the air blade or knife edge, thus causing the whistle to be quiet over selected periods of time, even though the operator is still blowing into the air conduit.

Another object of the present invention is to provide a whistle in which particular tunes may be played with distinct notes sounded over selected time intervals, by operation of a simple control mechanism.

Further it is an object of the present invention to provide a whistle in which notes may be distinctly played in rapid succession whereby a Morse code type of signal may be imitated.

In the present invention, the essential features include a whistle having means for passing a stream of air over the mouth of a resonant chamber, onto an air stream splitting edge so positioned as to cause a resonant whistle sound dependent upon the size of the resonant chamber. Also included in this structure are pistons which may vary the size of this resonant chamber. Controlled by the movement of these pistons are air deflecting elements which may be moved between the air jet and the knife edge, whereby the air jet is deflected around the air blade or knife edge in such a manner that the whistle sound is completely stopped.

This particular feature does not depend on an absolute interruption of the air jet as does the ordinary air admission valve found on player organs, pianos and the like. Nor is this deflecting element positioned in the same place as or to operate as, an admission valve usually found in such player organs etc., but rather operates on the principles of air deflection, whereby the air entering the whistle is not cut off, but is merely deflected from the air stream splitting edge of the whistle. This particular feature permits the use of a less expensive construction to obtain a musical instrument capable of playing distinct selected and timed notes.

These and further advantages and objects of the present invention will be more clearly understood when considered in connection with the accompanying drawings in which:

Figure 1 is a cross sectional elevation of the invention,

Figure 2 is a view taken along the lines 2—2 of Figure 1,

Figure 3 shows a fragmentary cross sectional side elevation of a modification,

Figure 4 shows a view taken substantially along the lines 4—4 of Figure 3,

Figure 5 shows a top plan view of another modification of the invention, while,

Figure 6 illustrates a cross sectional view taken along the lines 6—6 of Figure 5,

Figure 7 is a fragmentary cross sectional view taken substantially on the line 7—7 of Figure 6,

Figure 8 is a cross sectional elevation of a further modification,

Figure 9 is a cross section taken substantially on the line 9—9 of Figure 8,

Figure 10 illustrates a modification of the invention embodied in the shape of a horn in fragmentary cross section,

Figure 11 illustrates a fragmentary cross sectional rear view of the horn illustrated in Figure 10,

Figure 12 is a cross sectional view taken on the line 12—12 of Figure 10,

Figure 13 is a cross sectional elevation of a still further modification,

Figure 14 is a top plan view of the modification shown in Figure 13, and,

Figure 15 is an elevation of one of the elements in the modification of Figure 13.

In the present invention, the various parts of the whistle may be made of a variety of materials, but preferably of a plastic such as styrene or acetate, with the exception of the air deflecting mechanism which is preferably made of a strip of metal. This deflecting mechanism may, however, also be made of plastic. Additionally, the piston should be made of a resilient non-binding material such as sponge rubber or the like.

In the version illustrated in Figures 1 and 2 there is provided a resonant chamber 1 preferably cylindrical in cross section. Slidable within this chamber is a piston member 2 formed of a resilient non-binding material such as rubber or the like. This piston 2 is fixed on a shaft 3 by means of a metal washer 4, positioned below the piston, and an enlarged head 5 formed at the top of the shaft 3. This shaft 3 extends through the lower end of the chamber or tube 1, passing through a close fitting opening in the bottom 6. The lower end of this shaft 3 may be terminated in a handle preferably in the form of a ring 7. This shaft is freely slidable along the length of the chamber 1 and provides means for varying the size of the cavity at the upper end of the tube. Positioned at the upper end of this tube is an air conduit 8 having an opening 9 at one end which serves as an air inlet mouth piece. The other end of this air conduit 8 tapers to a narrow constricted opening 10 often called a plate of air. Positioned parallel and directly opposite this constricted opening 10 is an air stream splitting edge 11, often called the lip, extending for at least the length of the constricted opening 10. This lip or knife edge 11 tapers at its lower side 12 into the resonant chamber 1. The lip 11 is so positioned as to split air impinging on it from the opening 10 into two streams, one towards the resonant chamber 1 and one upwardly through the opening 17. Thus, as an operator blows into the mouthpiece 9 the air passing through the opening 10 will be caused to vibrate and generate a whistle sound dependent upon the resonant frequency of the chamber 1, at that particular time. A flat elongated member 13 formed with a selected number of openings 14, and preferably made of metal is positioned with its lower end 15 fixed by any suitable means to the top of the piston 2 or the cap member 5. The upper end of this elongated member passes between the constricted opening 10 and the knife edge 11, close to the opening 10. A bar or projecting member 16 ex-

tending across the open top 17 of the resonant tube 1 serves to guide this elongated flat plate member 13 upwardly in its proper position. Thus, as the shaft 3 is raised and lowered by the operator, the openings 14 and their intermediate spacing elements 18 come successively into alignment with the constricted opening 10 and the knife edge 11. When an opening 14 is aligned with the constricted opening 10 and knife edge 11, air blown from the mouth piece will pass freely and unimpeded to the knife edge 11 and will cause the whistle to sound without any interference. When the spacing element 18 between the holes 14 aligns with the constricted opening 10 and knife edge 11, air passing through the air conduit 8 will hit this element 18 and be deflected away from the knife edge 11. Under these circumstances, the deflection of this air is sufficient to prevent the resonating of the whistle, and consequently prevents the emission of any sound. It has been found, that the width of these intermediate strips 18 between the holes 14 may be quite narrow and if desired may be in the range of a thirty-second of an inch or even less. If close enough to the opening 10, these strips may be substantially the width of a thin wire. As the particular note sounded is a function of the length of the resonant chamber 1, which in turn is determined by the position of the piston, it may readily be seen that by properly selecting the positions of the holes 14 and their relations with one another, an entire scale of notes or more may readily be played when the piston is raised and lowered. It will also be clear from an examination of these drawings that the size of the openings 14 may be varied relative to one another to obtain a note of relatively different time duration. Thus an operator may, by blowing into the mouthpiece 9, over a period of time and by simultaneously raising and lowering the shaft 3, play any preselected series of notes for relatively selected lengths of time, thus permitting simple tunes or scales to be played.

In the modification illustrated in Figures 3 and 4 there is shown a whistle in which the resonant tube 20 is provided with a piston 21. This piston 21 is mounted on the shaft 22 by means of a cap element 23 formed at the top of the shaft 22 and a fixed washer 24 positioned below the piston 21. An air conduit tube 25 having an open end forming a mouth piece 26 at one end narrows to a constricted opening 27 at the other end. This air conduit 25 is positioned at the upper end of the resonant tube 20 with its constricted opening 27 aligned directly opposite an air blade or knife edge 28 formed slightly more than the width of the constricted opening 27. A flat elongated deflecting plate 29 fixed at its lower end to the top of the piston 21 extends through the open top 30 of the whistle at a point close to the constricted opening 27 and is guided in this position by a cross piece 31 extending over the opening 30. The upper end of this plate 29 is provided with an opening 32 through which a lever arm 33 extends. The lower end of this lever arm is fixed to a shaft 34 which extends in a plane at right angles to the shaft 33. The ends of this shaft 34 are fixed in recesses 35 which serve as bearings for the shaft 34. These bearings 35 are formed on the inner side walls 36 of a housing shaped to appear as a bird house, having a roof 37 and front wall 38 with an opening 39 in the front wall. The base of this bird house is fixed by means of the supporting element 40 to the upper side of the air conduit 25.

At the upper end of the shaft 33 is fixed an arcuate sector 41 extending forwardly and terminating in a bird-like figure 42 which is preferably representative of a cuckoo bird. This cuckoo bird 42 is positioned to project through the opening 39 as the lever arm 33 is rotated. Formed in the plate 29 are a pair of openings 45 which are selectively spaced along the length of the plate 29. In this arrangement the arc or rotation of the lever 33 is limited on its upstroke by the handle 46, which comes into contact with the bottom 47 of the resonant tube, and on its downstroke it is limited on its downward movement when the end of the arcuate sector 41 comes into contact with the top 48 of the resonant tube.

In the operation of this modification, the operator continuously blows into the mouthpiece 26 and simultaneously moves the handle 46 up and down its full stroke length. Consequently, the cuckoo bird 42 moves in and out of the house while the hole 45 is moved alternately into alignment with the constricted opening 27 and knife edge 28 at the end of each stroke. This results in a simulated cuckoo bird sound while the bird pops in and out of the house. If desired, spring tension may be applied to the piston, as for example by placing a helical expansion spring between the lower surface of the piston 21 and the bottom 47 of the resonant tube to maintain a normal starting position for the whistle so that the notes will be sounded in their proper sequence.

In Figures 5, 6 and 7 there is illustrated a modification of the invention designed primarily to play specific tunes. In this modification, there are arranged a plurality, but preferably eight resonant tubes 50 of various fixed sizes, preferably arranged in scalar form. These resonant tubes are each provided with a knife edge 51, and air conduit passage 52, having an open end 53 forming the mouthpiece. The air conduit passage 52 is designed to permit air passing through to impinge on the edge 51. The resonant tube sections 50, are separated from the mouth piece sections 52 by a slot 54 extending entirely across and through each of the elements forming the separate resonant tubes. Connecting sections 55 and 56 extend across the ends of this slot 54 at either side of the whistle connecting the contiguous mouth pieces 52 to the contiguous tubes 50. These connecting elements 55 and 56 are preferably shaped with a circular cross section and serve as an axis for the disc 57. This disc 57 is split along one of its radii at 58 to allow it to be slipped on to one of the connecting segments 55 or 56. This disc 57 has a diameter and thickness sized to permit it to pass through the slot 54 and to rotate without binding. As illustrated in Figure 6, the disc is provided with a plurality of holes 59 of various sizes arranged to align successively a predetermined selected sequence with each of the resonant tubes. Thus as the operator blows through all eight mouthpieces simultaneously, and rotates the disc, the air will be allowed to pass through the mouthpiece on to the knife edge 51 of each resonant tube in a selected sequence at time intervals. It will be seen that by proper arrangement of these holes, specific tunes may be played. It should also be noted that it is quite possible in this arrangement to play several notes at a time, thus providing for chords and further providing means for playing notes of different relative time duration.

In Figures 8 and 9 there is illustrated a whistle utilizing a fixed resonant chamber in connection with a resonant chamber of variable sizes. In this construction, a tube generally designated 60 has extending from its center portion an air conduit 61. This air conduit is open at one end forming a mouth piece 62. The end of the conduit 61 adjacent to the tube 60 is split in two halves forming two constricted openings 63 and 64 at different levels and at different points of vertical alignment in the tube 60. These constricted openings are formed by wedge shaped sections formed on either half and at opposite sides of the air conduit 61. Opposite these constricted openings 63 and 64 are knife edges 65 and 66 at the ends of projections 67 and 68. These projections 67 and 68 border an opening 69 in the tube 60. The knife edges 65 and 66 define respectively the lower and upper limits of the fixed resonant tube 70 and the variable resonant tube 71. Thus air passing through the constricted opening 63 will be diverted, part through the opening 69 and part upwardly into the resonant chamber 70, while air passing through the opening 64 will be diverted by the knife edge 66, part through the opening 69 and part downwardly into the variable chamber 71.

Positioned in the variable chamber **71** is a slidable piston **72** having a shaft **73** fixed thereto with a substantially flat elongated control plate **74**, fixed at its lower end by suitable means to the piston **72**. This control plate **74** extends longitudinally through the variable tube **71** into the fixed tube **70** at a point close to the constricted openings **63** and **64**. It may be held properly in position between the pins **75** and the projections **76**, on the walls of the tubes **70** and **71**. This control plate is provided with a plurality of selectively spaced holes **77** aligned in two distinct columns with each column positioned to align with one of the constricted openings **63** or **64**. Thus as the shaft **73** is raised and lowered, the openings **77** will come into alignment at selected times with the openings **63** and **64**. On an upward stroke, it is possible to play notes of increasingly high frequency together with notes having a lower frequency, the lower frequency resonating from the chamber **71**.

The principle illustrated in the modification of Figure 8 may be used in a whistle wherein a plurality of tubes each of different fixed resonance are arranged adjacent one another. Each tube would be provided with an individual plate corresponding with plate **74**, but all operated simultaneously from a single control arm. Air may be provided in a jet stream from a manifold arrangement at the open end of the tubes.

In Figures 10 and 12, there is illustrated a still further modification of the invention in the form of a bent tubular musical instrument. In this modification, the air conduit and mouthpiece **80** terminate in a constricted air opening **81** which is positioned directly opposite the knife edge **82** formed on the wall of the tube **83**. This tube **83** has the resonant chamber **84** formed at its lower end. Within this resonant chamber **84** is positioned the piston **85** and shaft **86**. The shaft **86** has a X-shaped cross section as illustrated in Figure 12. This shaft **86** extends through an opening in the plate **87** adapted to receive the shaft **86** and out through the bottom of the horn. A handle **88** is provided at the lower end of this shaft.

This X cross section of the shaft **86** prevents its rotation within the resonating chamber **86**. At the upper end of the piston **85** is secured a plate **89** adapted to slide vertically with the movement of the piston **85**. This plate **89** is provided with a plurality of holes **90** spaced at uniform distances and of uniform sizes and so selected as to successively align themselves with the opening **81** and knife edge **82** whereby distinct notes may be played.

The upper end of this plate **89** has affixed to it a button **91** which preferably projects through a longitudinal slot **92** in the casing of the tube **83**. This button **91** guides the vertical movement of the plate **89** and also successively aligns itself as a note with the bars **93** imprinted on the outside of the case **83**. These bars **93** and the intermediate markings **94** are so arranged as to represent the five lines and four spaces of the musical staff. By proper selection, and positioning of the holes, **90**, and arrangement of these lines **93**, the button **91** may be aligned in this staff to indicate the particular note being played.

A plurality of openings **95** are provided above the knife edge **82** to permit the ready outward passage of air from the horn.

In Figures 13, 14 and 15 there is illustrated a still further modification of this invention. In this modification, the air conduit **100** and mouthpiece **102** terminates in a constricted air jet opening **101**, aligned with the knife edge **111**. These elements are fixed in an upper housing generally designated **103**. Positioned below the air jet opening and knife edge **101** and **102**, is a cylindrical opening **104** in which has fixed in it an extruded tube **105** open at both ends.

As will be noticed in Figure 14 the upper opening **106** of the housing **103** is generally rectangular in shape with two aligned slots **107** extending from the two corners of this rectangular opening **106** closest to the constricted opening **101**. These aligned slots **107** are sufficiently wide

enough to receive the elongated plate **108** when it is inserted downwardly from the top of the whistle. This plate **108** is provided with a plurality of aligned openings **109** passing therethrough and is provided at one end with a piston **110** secured by suitable means. This piston **110** may as illustrated slide vertically with its piston **110** upward within the tube **105** thus permitting the variable whistle sounds to be blown on the whistle as the plate **109** is raised and lowered. If the operator on the other hand wishes to obtain a signal much like the Morse code signal, the plate **108** is removed from the tube **105** and is inserted through the opening **106** with its sides extending into the slots **107**. The whole whistle is then inverted to an up-side-down position so that the weight of the plate **108** will normally allow it to fall out of this slot **107**. By raising and lowering the plate **108** rapidly with the finger while blowing into the whistle, a very rapid intermittent whistle sound similar to that of a radio transmission of Morse code may be obtained.

By removing this plate altogether from the whistle, the operator may obtain a steady whistle sound of constant frequency.

This whistle may also be operated by holding the whistle with the resonant tube **105**, downwardly, and inserting the plate **108** upwardly through the resonant tube so that the upper end of the plate **108** projects through the opening **106** with its sides fitting into the slots **107**. The operator may thus grasp the plate **108** from above and raise and lower it to selected positions as desired. To facilitate the operation of the whistle, when used in this manner, a series of markings may be molded or otherwise formed on the outside of the tube **105** to indicate to the operator the particular note being played. Such markings may take the form as the markings illustrated at **93** in Figure 10.

Having now described my invention, I claim:

1. A bird call whistle of the type described comprising an air conduit terminating in a constricted opening, a resonant tube with one open end, said end having a knife edge aligned with said constricted opening to deflect air passing through said opening, a slidable elongated member having a hole formed therein positioned between said opening and said edge and extending longitudinally of and into said resonant tube, and means for selectively positioning the hole in and out of alignment with said edge and opening whereby the flow of air may be selectively deflected from the knife edge.

2. A bird call whistle of the type described comprising an air conduit terminating in a constricted opening, a resonant tube with an open end, said end having a knife edge aligned with said mouth opening to deflect air passing through said opening, a piston positioned within said tube for varying the length of the tube, means adapted to be intermittently positioned between said opening and said edge to deflect the flow of air from said knife edge and members connecting said means and piston for operation of said means through the movement of said piston.

3. A bird call whistle of the type described comprising an air conduit terminating in a constricted opening, a resonant tube with one open end, said end having a knife edge aligned with said constricted opening to deflect air passing through said opening, a piston positioned within said tube for varying the size of the tube, an elongated member having a hole formed therein positioned between the opening and the edge, said elongated member fixed at one end to said piston and adapted to move with it whereby the hole may be brought in and out of alignment with the opening and edge, at selected positions of said piston.

4. A whistle having an air conduit terminating in a constricted opening and an aligned air deflecting edge, means for selectively stopping the whistle sound comprising a slidable elongated plate having a plurality of aligned and spaced holes formed therein positioned between the opening and edge, and means for longitudinally sliding

said plate whereby the holes and spaces between them successively align with the opening and edge for selectively deflecting the flow of air from the edge.

5. A whistle of the type described comprising an air conduit terminating in a constricted opening, a resonant tube with one open end, said end having an air deflecting edge aligned with said constricted opening to deflect air passing from said opening, a slidable piston positioned in said tube, a slidable elongated plate having a plurality of aligned and spaced holes formed therein positioned between the constricted opening and edge, said plate fixed at one end to said piston and adapted to move with it whereby said holes and spaces between them may be successively aligned with said constricted opening and edge at selected positions of said piston.

6. A bird call whistle of the type described comprising an air conduit terminating in a constricted opening, a resonant tube with one open end, said end having a knife edge aligned with said constricted opening to deflect air passing through said opening, a piston positioned within said tube for varying the length of the tube, an elongated member having a plurality of holes formed therein positioned between the opening and the edge, said elongated member fixed to said piston at one end, and adapted to move with it and having a figure secured at its other end, whereby the figure will be animated on movement of the piston and said holes may be brought in and out of alignment with the opening and edge at selected positions of said piston.

7. A whistle as set forth in claim 3, having a lever arm pivoted at one end and fixed at its other end to the upper end of said plate whereby said lever arm will pivot upon sliding the piston.

8. A whistle as set forth in claim 7, wherein a figure is fixed to the end of said lever arm.

9. A whistle as set forth in claim 7 having a bird fixed to the end of said lever arm and a bird house having an entrance formed therein through which the bird is adapted to be moved as the piston is operated.

10. A whistle as set forth in claim 17 wherein a musical staff is formed about said elongated opening and said guide means cooperates with said staff to indicate relative positions of said piston.

11. A bird call whistle of the type described comprising an air conduit terminating in a constricted opening, a resonant tube having an open end with an air deflecting edge aligned with the opening, a piston positioned within the tube, a plate adapted to be positioned between the constricted opening and edge whereby air from the conduit may be deflected from the edge, and means interconnecting said plate and piston for simultaneously moving said piston along said tube and positioning the plate between the opening and edge during selected intervals of said piston movement.

12. A bird call whistle of the type described comprising an air conduit terminating in divided constricted openings, a pair of resonant tubes both having an open end and an air deflecting edge at said end with the edges aligned each with one of said constricted openings, a piston positioned in one of said tubes for varying the length of the tube, an elongated strip having spaced holes formed therein positioned between said constricted openings and said edges, said strip secured at one end to said piston and adapted to move with it whereby said holes may be moved successively between said openings and said edges.

13. A whistle as set forth in claim 12 wherein said constricted openings are staggered and said holes are formed on either side of the center of said elongated strip whereby the constricted openings may each be aligned with holes on opposite sides of the strip.

14. A bird call whistle of the type described having an air conduit terminating in a constricted opening and an aligned spaced air deflecting blade, a resonant tube open at both ends with its upper end fixed below said conduit and air deflecting blade and in alignment with the space between said last two mentioned elements, an elongated control plate having a plurality of holes formed therein and a piston affixed to one end, said piston adapted to be inserted within the tube to vary the size thereof, and said plate adapted to be inserted through said space between said conduit and blade whereby said holes may successively be aligned with said conduit and blade.

15. In a whistle as set forth in claim 3 said resonant tube positioned at right angles to said air conduit with the open end below said opening and edge, and with said elongated member extending longitudinally of and into said resonant tube.

16. A whistle as set forth in claim 3, wherein said air conduit and resonant tube forms a portion of a casing, said casing being shaped in the form of a bent tubular musical instrument.

17. A whistle as set forth in claim 15, wherein said casing is provided with an elongated slot and guide means, guide means fixed at one end to said elongated member and projecting through said slot.

18. A whistle as set forth in claim 11 wherein said resonant tubes are longitudinally aligned with their open ends adjacent one another and said elongated strip extends into both of said tubes.

19. A whistle as set forth in claim 13, wherein means are provided at the space between said conduit and blade for guiding said plate and longitudinal movement therebetween.

20. A whistle as set forth in claim 3 having a handle member secured at one end to said piston and extending out of an end of said tube.

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