A. W. SCHREINER.

RESONATOR.

APPLICATION FILED DEC. 12, 1917.

1,328,059.

Patented Jan. 13, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

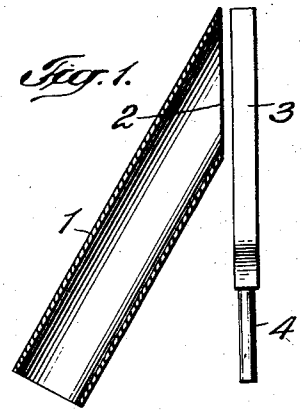


Fig. 2.

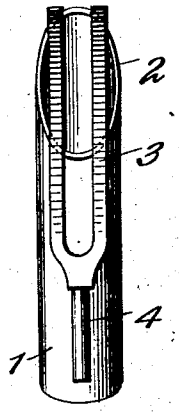


Fig. 3.

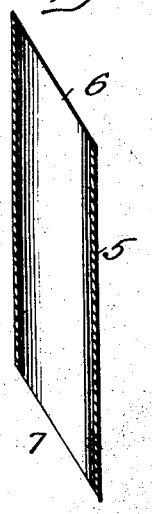


Fig. 4.

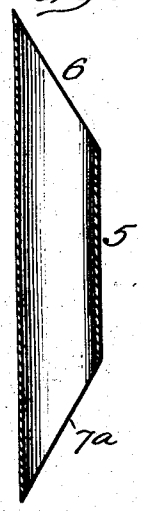


Fig. 5.

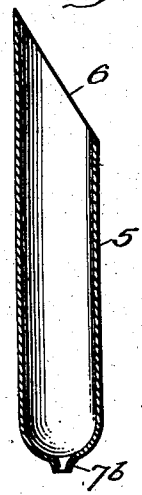


Fig. 6.

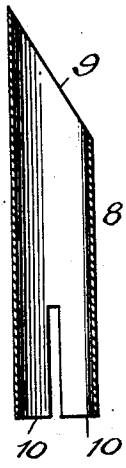


Fig. 7.

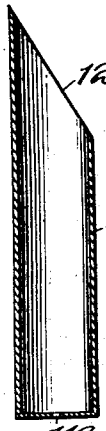


Fig. 8.



Fig. 9.

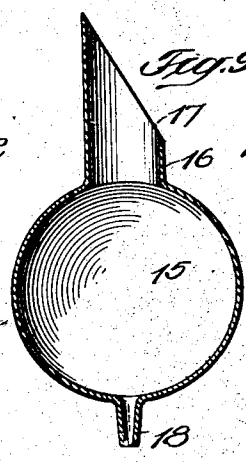


Fig. 10.

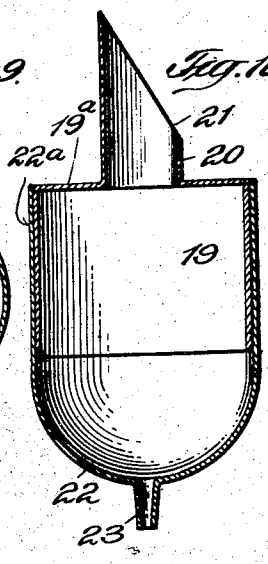
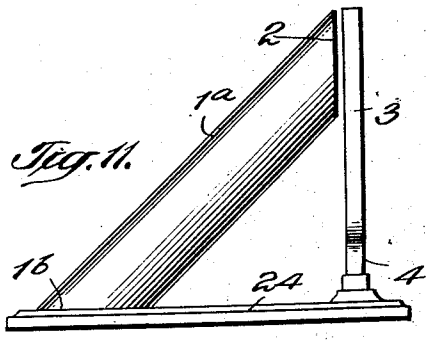


Fig. 11.



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2 SHEETS—SHEET 2.

Fig. 12.

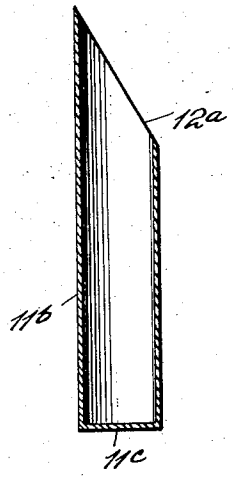


Fig. 13.

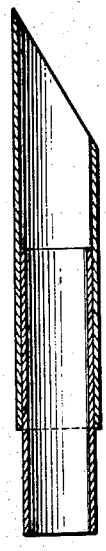
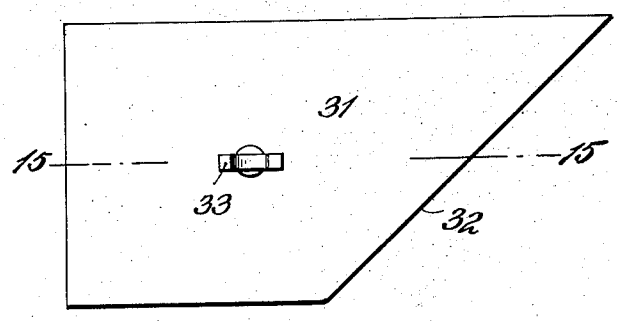


Fig. 14.



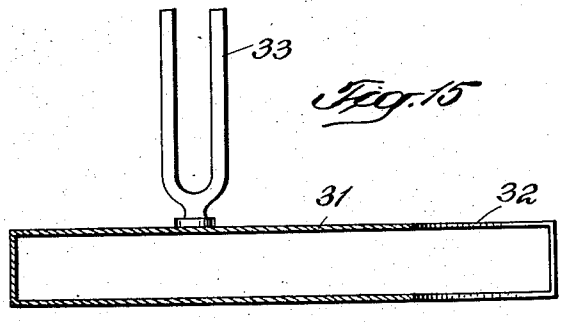


Fig. 15.

Fig. 16.

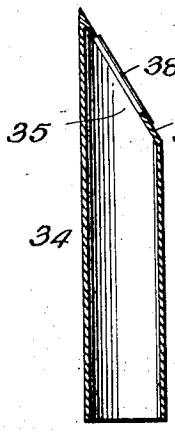
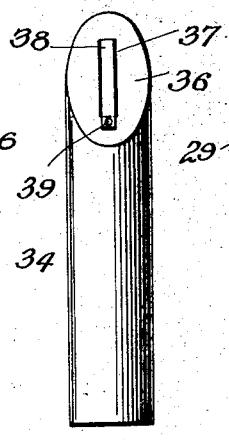


Fig. 17.



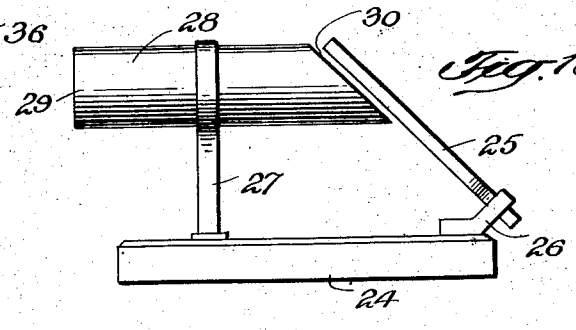


Fig. 18.

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UNITED STATES PATENT OFFICE.

ARTHUR W. SCHREINER, OF BROOKLYN, NEW YORK, ASSIGNOR TO STANDARD SCIENTIFIC COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

RESONATOR.

1,328,059. Specification of Letters Patent. Patented Jan. 13, 1920.

Application filed December 12, 1917. Serial No. 206,722.

To all whom it may concern:

Be it known that I, ARTHUR W. SCHREINER, a citizen of the United States, and resident of the borough of Brooklyn, in the county of Kings, city and State of New York, have invented certain new and useful Improvements in Resonators, of which the following is a specification, reference being had therein to the accompanying drawing.

My present invention relates to a resonator for use in connection with a tuning fork, reed, bar, or other tone-producing device. One object is to increase the amount of resonance so that a louder tone will be produced or emitted than is possible with those forms of resonators now on the market. Another object is to direct the sound. The invention consists essentially in cutting off one end of the resonator with a long diagonal or shearing cut so as to allow a greater surface of the tuning fork, reed or vibrating body to be located opposite or attached to this open end of the resonator, and thus to agitate the air in the resonator and give a greater resonance than is possible in those cases where the resonator is cut at right angles and the area of the opening which is used in distributing the air is very much smaller, it being understood that the body of the resonator may partake of a great variety of forms, as round, square, oval, rectangular, etc. And the invention also comprises numerous details and peculiarities in the construction, combination and arrangement of the parts substantially as will be hereinafter described and then more fully pointed out in the claim.

In the accompanying drawing illustrating my invention:—

Figure 1 is an edge view of an ordinary tuning fork and a vertical section of a tubular resonator placed close to said fork and having one end thereof cut off diagonally in accordance with my present invention.

Fig. 2 is a front elevation of the same, the view being at right angles to the view in Fig. 1.

Fig. 3 is a longitudinal section of a tubular resonator having both ends provided with diagonal cuts, but with said cuts in parallel planes, the object of thus having both ends cut in this manner being that one is used for emitting a greater volume of sound and of directing same at right angles to the plane of the cut.

Fig. 4 is a similar longitudinal section of a resonator tube with both ends formed with diagonal cuts, but said cuts extending in opposite directions.

Fig. 5 is a longitudinal section of another form of resonator tube having one end provided with a diagonal cut and the other formed with a bulb having a central perforated nipple.

Fig. 6 is a longitudinal section of a resonator tube having one end provided with a diagonal cut and the other slitted to form an integral tuning fork.

Fig. 7 is a longitudinal section of another form of resonator tube having one end provided with a diagonal cut, and the other closed by a head having a central perforation.

Fig. 8 is a side view of a combined tuning fork and resonator tube having a diagonal end.

Fig. 9 is a cross-section of a Helmholtz resonator provided with a diagonal cut on one side, and a small nozzle at the other side.

Fig. 10 is a cross-section of an adjustable form of resonator having a cylindrical body provided with a diagonally cut tube, said cylindrical body telescoping with the cylindrical part of a semi-globular form provided with a central nozzle.

Fig. 11 is a side view of a resonator device consisting of a stand which carries a tuning fork thereon, and alongside thereof a diagonally-cut resonator tube which is secured at its opposite end to the stand so that the ear or mouth or orifice of the resonator tube may be in close proximity to the tuning fork.

Fig. 12 is a longitudinal section of a modified form of tubular resonator, similar to the form in Fig. 7, but showing one end entirely closed.

Fig. 13 is a sectional view of a tubular resonator having telescoping parts.

Fig. 14 is a plan view of a resonator box carrying a tuning fork.

Fig. 15 is a cross-section of the same on the line 15, 15 of Fig. 14.

Fig. 16 is a longitudinal section and Fig.

17 an elevation of a tubular resonator having its diagonally cut end provided with a slotted cover having a reed placed therein, usually for organs or organ pipes.

Fig. 18 is a side view similar to Fig. 11 of a resonator device consisting of a stand on which is a vertical upright carrying a horizontal resonator tube having a diagonally cut end near which is a tuning fork in an inclined position supported by a holder fixed in the base or stand.

Similar characters of reference designate corresponding parts throughout the different figures of the drawing.

In the drawing I have shown a large number of different forms of resonators in order to explain how widely my invention may be applied for use. In all of these forms the essential idea of the invention appears, which is that of a diagonal cut across one or both ends of the resonator instead of the ordinary right angled cut which is commonly found in resonators. Although I have shown such a large number of forms, I do not wish to be restricted to these, as it is obvious that the invention may be used still more extensively, with a still wider range of application, since the essential idea is that of the inclined or diagonal cutting of the end of the resonator tube, so as to provide a larger opening than otherwise, or an opening of larger area, and thus give a greater area for the disturbance or vibration of the air the result of which will be more resonance and a louder tone. The tuning fork shown is given simply as an example of a vibrating body. Such body may be single or with any number of arms or members.

It will be obvious by referring to Figs. 1 and 2 that the prongs 3 of the tuning fork 4 when placed opposite a diagonally-cut end 2 of a resonator tube 1 will expose a greater surface of said prongs to such a diagonally-cut opening than to an opening cut straight across at right angles, since the diagonal cut will be of greater area than the cross cut. Therefore, the ear or mouth of the resonator at 2 will give a greater resonance to the tone, for there will be a greater vibration of air, and the tone of the tubular resonator will be considerably magnified over what it would be if the resonator ear were cut straight across and not on an incline.

The form 5 of the resonator tube shown in Figs. 3, 4 and 5 has the diagonal cut 6 at one end, while the opposite end is variously formed in the manner respectively indicated at 7, 7^a, and 7^b.

In Fig. 6, 8 denotes a resonator tube having a diagonal opening 9 at one end while the opposite end is formed with prongs 10 to furnish a tuning fork of a particular pattern. The tube 11 in Fig. 7 has a diagonal opening 12, and the opposite end is closed except for the central perforation 11^a. In Fig. 12 the tube 11^b has a diagonal opening 12^a at one end, while the other end 11^c is entirely closed.

In Fig. 8 the tube 13 carries the tuning fork 12 supported thereon, while the diagonal end 14 of tube 13 produces a magnified tone, because it exposes a considerable air surface to the air to intensify the tone.

A Helmholtz resonator is shown in Fig. 9 with my improvement applied thereto. It consists of a globe or sphere 15, having a tubular extension 16 with a diagonally-cut end 17, while opposite to the tubular resonating member 16 the globe 15 is provided with a nozzle 18. In this way I am enabled to take any well known form of resonator, and providing it with my present improvement, expose a larger surface to the air and thereby intensify the tone.

In Fig. 10, I show a resonator, which is similar to the Helmholtz resonator, and is called commonly a Universal resonator. Instead of having a globular member 15 it has a semi-globular member 22 provided with a nozzle 23 similar to the nozzle 18, said semi-globular member 22 being formed integral with a cylindrical portion 22^a, which is entered by a telescoping cylinder 19 having a head 19^a on one end which carries a tubular resonator member 20 formed with a diagonally-cut opening 21, which is located opposite to the aforesaid nozzle 23 with which the semi-globular member 22 is provided. The head 19^a of the cylinder 19 has a rabbeted edge which fits over the end of the cylindrical member 22^a when the cylinder 19 is pushed into the cylinder 22^a its full distance as shown in Fig. 10.

A very convenient form of device is shown in Fig. 11 consisting of a stand 24 on which is mounted a tuning fork 4 having prongs or tines 3. Said stand 24 also carries a tubular resonator tube 1^a mounted in an inclined position on the stand 24 at 1^b, said tube 1^a having a diagonal opening 2 which is opposite to the prongs of the tuning fork 3. In Fig. 18 a similar arrangement is displayed except that the tuning fork is there mounted in an inclined position, while the resonator tube is carried in a horizontal position and is of a somewhat different form from that shown in Fig. 11. Thus on the stand 24 is a tuning fork 25 carried in an inclined position on a holder 26 which is affixed to the stand 24, and on the same stand at a short distance from the holder 26 is a stand 27 which carries in a horizontal position a tubular resonator 28 having one end cut square off at 29 and either closed or open, while the other end 30 is cut off on a diagonal plane and exposes a mouth of considerable area immediately contiguous to the tines or prongs of the tuning fork 23 which lie parallel in Fig. 18 to the plane of the said diagonal opening 30.

In Figs. 14 and 15 instead of a tubular resonator I show an example of a resonance box 31 having a general square or rectangular form and closed on all sides except one which is cut off with a long diagonal or shearing cut at 32, providing a mouth of enlarged area which is similar to the diagonal-cut off ends of the tubular resonator shown in some of the other figures of the drawings. Box 31 may obviously be of any suitable material and size and form, and on it is mounted a vibrating body, as for example the tuning fork 33 having any number of prongs. The vibration of said fork will obviously have its tone magnified by reason of the diagonally cut opening 32.

In Figs. 16 and 17 I show a still further form of the invention adapted for pipe organs or organ pipes of various kinds, in that a reed is employed in a diagonally cut off end. In said Figs. 16 and 17 34 denotes a tubular resonator having a diagonally cut off end 35 closed in part by a plate 36. Said plate or cover 36 has therein a longitudinal slot 37 in which is mounted a reed 38 by a pin, screw or rivet at 39. The reed 38 vibrates in the slot 37 and the tone thereof is intensified or magnified by reason of the fact that the cover 36 is located in the opening 35 which is of a larger area than if it were cut square across.

In all of these different forms of the same idea exists; viz., that of employing a resonating member having a diagonal cut on at least one end or portion thereof which provides an opening of enlarged area whereby the tone of the resonator is increased so that the device has a greater resonance.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

In an acoustically tuned resonator, a body portion of suitable volume, having a receiving end, and a diagonally cut emitting end, adjoined thereto, substantially as described.

In testimony whereof I hereunto affix my signature.

ARTHUR W. SCHREINER.