E. H. OVERHOLT.

SIGNAL HORN.

APPLICATION FILED FEB. 9, 1914.

1,180,524. Patented Apr. 25, 1916.

Fig. 1.

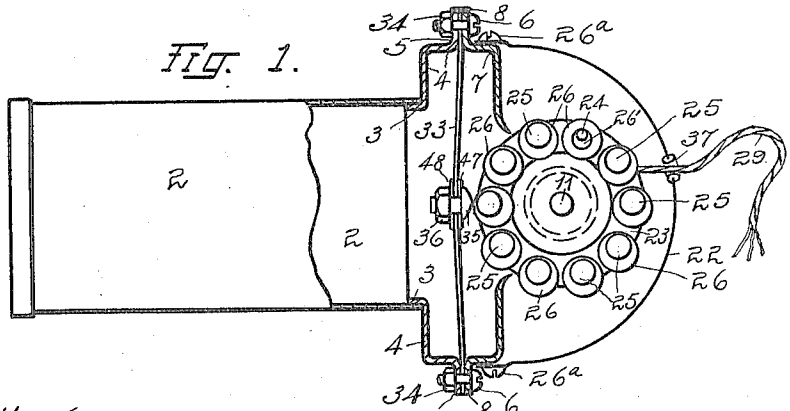


Fig. 3.

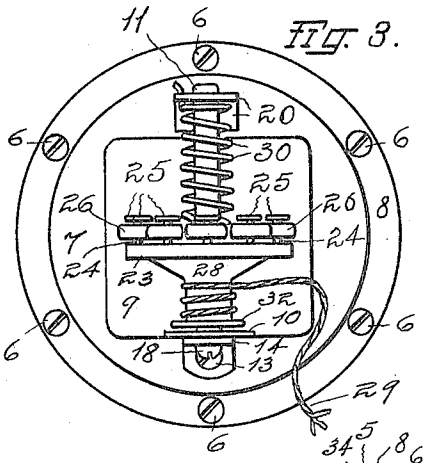


Fig. 2.

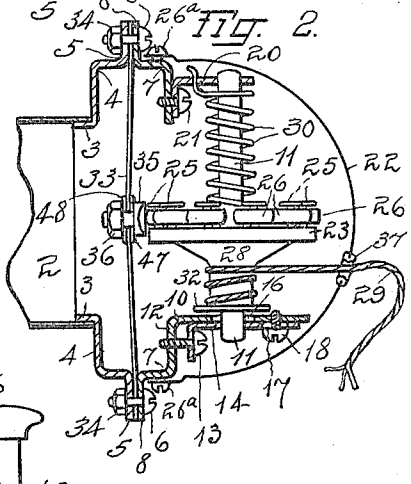


Fig. 4.

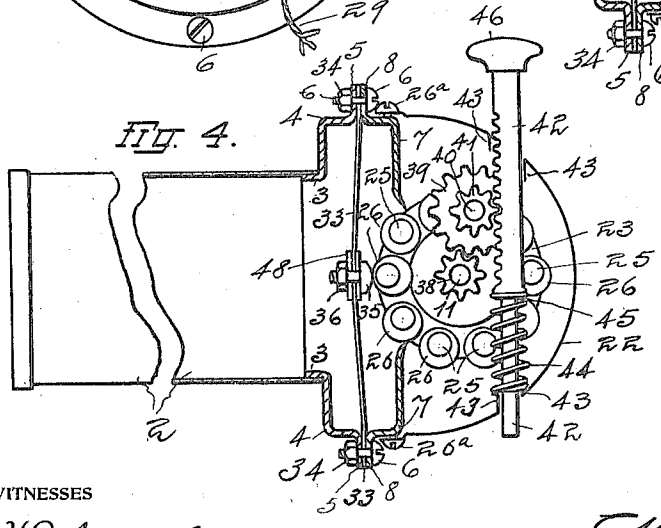
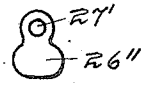


Fig. 5.



WITNESSES

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SIGNAL-HORN.

1,180,524. Specification of Letters Patent. Patented Apr. 25, 1916.

Application filed February 9, 1914. Serial No. 817,561.

To all whom it may concern:

Be it known that I, EDWARD H. OVERHOLT, a citizen of the United States, and a resident of Galesburg, in the county of Knox and State of Illinois, have invented a new and useful Signal-Horn, of which the following is a specification.

The invention relates to that class of horns in which a sounding member or diaphragm is caused to vibrate in order to produce an alarm.

A type of this general class is shown and described in my copending application Serial No. 800,316 (granted Feb. 16, 1915, as Patent No. 1,128,816), and the present invention embodies and comprises improvements on the class of devices therein disclosed.

One of the principal objects of the invention is to provide novel means for causing the diaphragm or sounding-member to vibrate.

Another object is to provide novel means for setting said means in action.

A still further object is to provide novel mechanism, manually actuable, for imparting rotatory-revoluble movements to the means comprehended in the second recited object, and for automatically restoring the elements to normal positions.

Summarily stated, the objects of the invention are to generally improve the construction, and to increase the utility, durability, efficiency and tone-quality of horns of this character.

In the following specification I shall refer to certain structures which might be adopted in the practice of my invention, but have by no means attempted to specify all which may be employed, the object and intent of this description being mainly to instruct others to carry out the invention in the forms at present preferred by me and to enable them to fully comprehend its nature and general character; and I desire it to be distinctly understood that specific mention by me of some modifications is in no wise intended to exclude others not referred to but which reside within the spirit and scope of the invention, viewed in its broadest aspect, and as defined in the appended claims.

In the accompanying drawings: Figure 1 is a side elevation, partly in section, of one preferred embodiment of my invention; Fig. 2, an edge elevation, partly in section, showing the same elements as are illustrated in Fig. 1; Fig. 3, a rear end view, the cap removed; Fig. 4, a view similar to Fig. 1, but another form of diaphragm-actuating means being here shown; and Fig. 5, a face elevation of a modified type of hammer enlarged with reference to the other figures.

Coming now to a detailed description of said drawings, and referring to the several elements and parts thereof, where necessary, each by a distinguishing reference numeral, 2 designates a horn which may be of any suitable character, shown as frictionally secured on the axial, annular projection 3 of a cupped stamping 4 having an annular peripheral flange 5 provided with a series of openings for the reception of the stems of bolts 6.

7 indicates a companion stamping provided with a peripheral flange 8 having a series of openings corresponding to those above noted in the stamping 4. For convenience the stampings 4 and 7 may be termed casing rings. The ring 7 is cut away as indicated at 9 to provide a central opening, and one of the cut (but not cut away) portions is turned rearwardly to form an ear 10 (Fig. 2) having an elongated slot 16 in which one end of a shaft 11 (presently more specifically referred to) may move.

12 designates a vertically standing intermediate portion, provided with a threaded aperture for the engagement of the stem of a set-screw 13 which first passes loosely through the vertical arm of an L-shaped adjusting bracket 14 having an aperture 15 in which one end of the shaft 11 has a bearing.

17 designates an elongated slot in the bracket 14, and 18 indicates a locking screw the head of which is somewhat larger than the width of said slot and the stem of which engages a threaded aperture in the ear 10.

20 designates an L-shaped bracket, its vertical arm secured by a screw 21 to the corresponding arm of the ring 7 and its horizontal arm provided with a bearing for the shaft 11.

22 indicates a cap secured to the ring 7 by screws 26ª or in any other suitable manner.

Fixed on the shaft 11 is a disk 23, having pins 24 projecting parallel with its axis and each provided with an enlarged head 25.

26, 26 are annular disks or hammers having each a central opening 26′ substantially larger than the diameter of the pin 24 on which it is pivoted, but smaller than the head 26. In order that the hammers will

not strike in the same spot (whereby a notch would quickly become worn therein, resulting in a less impulse being imparted thereto) I make the hammers or strikers quite thin relatively to the length of the exposed portion of the stem, whereby they will slide from end to end thereof and the blows will be hap-hazard or distributed throughout the entire length of the anvil face.

In Fig. 5 I have shown a modified type of hammer, 26″, the opening 27′ in which is very slightly greater in size than is the pin 24 on which it is pivoted.

28 is a spool or reel which may be either integral with or secured to the disk 23.

30 designates a coil spring one end of which engages an aperture in the bracket 20 and the other end of which engages the disk 23.

29 represents a cord wound on the spool 28, its convolutions being opposite those of the spring 30.

32 designates a spool-end.

33 indicates the diaphragm or sounding-member, its border clasped between the annular flanges of the rings 4 and 7 and preferably perforated by the bolts 6, which latter are secured by nuts 34. The diaphragm is preferably made of a composition which is resilient, non-metallic, non-rustable, non-corrosible, water-proof and a non-conductor of electric current.

35 designates an agitator or anvil, its constricted stem piercing the diaphragm at its center. 36 indicates a nut threaded on said shank.

To operate the instrumentalities above described, the operator will draw quickly or jerk the free end of the cord 29 (which passes freely through an eye 37 in the cap 22) to impart rapid rotary movement to the disk 23, whereby revoluble movement will be imparted to the hammers 26, and the rapidity of the movement will cause them to fly outward, centrifugally, and strike the anvil 35. Being loosely mounted on the pins 24 the hammers will be thrown toward the shaft 11, instantly upon striking said anvil, and their forward movement will carry them past the latter immediately they rebound. In striking the anvil the hammers depress or flex the diaphragm, as indicated in Figs. 1, 2 and 3, its normal position being perpendicular. However, they are so mounted on the pins 24 that even though the movement imparted to the disk or rotor 23 be insufficient to impart to them centrifugal movements, they will nevertheless strike the anvil and flex the disk, but less forcibly and to a lesser extent than when the disk is rapidly rotated. As each hammer releases from the anvil the resiliency of the sounding-member will cause it to reflex or return to or beyond its normal position, to bring the anvil into position ready for operation by the next succeeding hammer. These intermittent and successional blows of the hammers produce a resultant movement on the anvil and thereby on the diaphragm, (which rebounds accordingly) to produce sound waves of greater or lesser volume and duration, controllable at will, and dependent upon the rapidity of movement which the operator imparts to the rotor 23. When the cord has been drawn upon to the desired extent, to produce an alarm of the desired duration, it is freed, whereupon the spring 30, the coils of which were increased by the movements above described, will uncoil to its normal position and in so doing the hammers will again act upon the anvil as above described, and the elements will be returned to their normal positions, ready for another operation by means of the cord 29.

The operation of the modified form of hammers 26′ will be evident.

Reference is now to be had to Fig. 4, wherein I have shown a rotor-actuating pinion 38 secured on the shaft 11. 39 designates a spur wheel in mesh therewith and fixed on a shaft 40 mounted in bearings in the cap 22. 41 represents a pinion also fixed on the shaft 40 and actuated by a rack 42 reciprocally mounted in bearings 43 in the cap. 44 is a rack-return spring coiled upon the reduced stem of the rack 42, one of its ends resting against the shoulder 45 thereof and its other end taking against the inturned ends of the bearings 43. The operation of these means is as follows: By pressing on the rack-head 46 the teeth of the rack 42 will cause the pinion 41 to rotate and impart like rotatory movement to the spur 39 which will impart contrary rotatory movement to the actuating pinion 38, and through the instrumentality of the shaft 11 this will be transmitted to the rotor 23 which will carry and operate the hammers 26 in the manner hereinbefore described.

When the rack has been released, or when the pressure thereon has ceased, the spring 44 which was by such pressure compressed between the bearing-ends 42 and shoulder 45 will exert its stored energy to return the rack to its normal position, and in so returning it will impart to the gear wheels above recited movements in a contrary direction to that above described, and the hammers will strike the anvil and flex the diaphragm in the evident manner, the reflexing movements thereof imparting creating sound waves and further returning the anvil to position for contact by the next succeeding hammer.

Being non-metallic and preferably of fiber, all danger of crystallization of the central portion of the diaphragm is eliminated. In order to further preserve the latter from injury, washers 47, 48 are interposed, the first between said diaphragm and

the head of the anvil and the other between the nut 36 and said diaphragm. Being a non-conductor of electricity, it will not be affected thereby. Being rust proof it will not be injured by moisture. Being non-corrosive, acids (frequently contained in cleaning and polishing preparations) will not affect it.

The volume of the sound waves may be primarily determined by adjustments of the screws 13 and 18 to adjust the bracket 14 and thereby the shaft 11 to bring the hammers into the desired relationship to the vibrator 35.

Many of the details and combinations illustrated and hereinbefore described are not essential to the invention, broadly considered. All this will be indicated in the claims hereof, wherein the omission of an element or the non-inclusion of reference to the detail features of the elements mentioned is intended to be a formal declaration of the fact that the omitted elements or features are not essential to the invention covered by the claims.

Having thus described my invention and having set forth its objects, purposes, operation and advantages, I claim as new and desire to secure by Letters Patent the following, to-wit:

1. In a horn, a diaphragm, means in which it is held, an anvil having an elongated tapered face, means for securing the anvil to said diaphragm, a rotor arranged at a right angle to said diaphragm, manually actuable means for actuating it in one direction, a spring for actuating it in the contrary direction, a plurality of pins fixed axially of and to said rotor, each pin comprising a head and a stem, and anvil strikers mounted one on each pin, each of said strikers provided with an aperture much larger than the cross section of the pin on which it is mounted and smaller than the diameter of said head, and the length of the exposed portion of said stem much greater than the thickness of the striker, whereby the latter has free play both centrifugally and laterally.

2. In a device of the nature described, a horn-engaging casing-ring, a cap-carrying ring secured thereto, the last recited ring cut away at its median portion and bent to form an arm, a shaft-bearing bracket secured to said cap-carrying ring, a shaft-bearing bracket adjustably secured to said arm, a shaft seated in the bearings indicated and in a slot in said arm, a diaphragm held between said rings, an anvil secured thereto, a rotor fixed on said shaft, centrifugally actuated strikers carried thereby, a pinion fixed on said shaft, a spur-wheel in mesh therewith, a shaft on which said spur-wheel is fixed, a pinion fixed on the last recited shaft, and a rack for actuating the last recited pinion.

3. In a device of the nature described, a horn-engaging casing-ring, a cap-carrying ring removably secured thereto, the last recited ring cut away at its median portion and bent to form an arm, a shaft-bearing bracket secured to the cap-carrying ring, a shaft-bearing bracket adjustably secured to said arm, a shaft seated in the bearings indicated and in a slot in said arm, a diaphragm held between said rings, an anvil secured thereto, a rotor fixed on said shaft, centrifugally actuated strikers carried thereby, a pinion fixed on said shaft, a spur-wheel in mesh therewith, a shaft on which said spur-wheel is fixed, a pinion on the last recited shaft, a rack for actuating the last recited pinion in one direction, and a spring for actuating it in the contrary direction.

4. In a device of the nature described, a horn, a ring having a peripheral flange and having a projection arranged parallel to the axis of said horn, said horn engaged with said projection, a second ring having a peripheral flange, a diaphragm the edge of which rests between said flanges, means for securing said flanges together, an anvil secured to the diaphragm, a pair of brackets carried by the last recited ring, a shaft mounted in bearings in said brackets, a rotor fixed on said shaft, a pinion fixed on said shaft, a spur-wheel meshed therewith, a shaft on which said spur-wheel is fixed, a pinion fixed thereon, and a rack for actuating the last recited pinion.

5. In a device of the nature described, a horn, a ring having a peripheral flange and having a projection arranged parallel to the axis of said horn, said horn engaged with said projection, a second ring having a peripheral flange, a diaphragm the edge of which rests between said flanges, means for securing said flanges together, an anvil secured to the diaphragm, a pair of brackets secured to the last recited ring, a shaft mounted in bearings in said brackets, a rotor fixed on said shaft, a pinion fixed on said shaft, a spur-wheel meshed therewith, a shaft on which said spur-wheel is fixed, a pinion fixed thereon, a rack for actuating the last recited pinion in one direction, and means for actuating it in the contrary direction.

6. In a device of the nature described, a horn-engaging casing-ring, a horn engaged thereby, a cap-engaging casing-ring, a cap engaging it and provided with shaft-bearings, a diaphragm arranged between said rings, means for securing said rings together, an anvil secured to said diaphragm, a pair of brackets secured to said cap-carrying ring, a shaft mounted in bearings in said brackets, a rotor fixed thereto, strikers carried by said rotor, a pinion also fixed on said shaft, a shaft mounted in the bearings in the cap, a spur-wheel thereon and in mesh with said pinion, a pinion fixed on the

last recited shaft, and a rack reciprocatable in oppositely arranged apertures in said cap and adapted to actuate the last recited pinion.

7. In a horn, a disk-like diaphragm, annuli between which it is secured, one of said annuli provided with arms, an anvil secured to the diaphragm, a rotor, centrifugally actuated, loosely mounted strikers carried by the rotor and adapted to successionally strike said diaphragm, a shaft on which said rotor is fixed, a bracket secured to one of said arms and having a bearing for one end of said shaft, an adjusting-bracket secured to the other of said arms and provided with a bearing for the other end of said shaft, a second shaft, a spur-wheel thereon and in mesh with said pinion, a pinion on the last recited shaft, and a rack for actuating the last recited pinion.

In testimony whereof I hereunto sign my name, this 5th day of February, 1914, in presence of two subscribing witnesses.

EDWARD H. OVERHOLT.

Witnesses:
ROSE SANBURG,
MARY M. STABLEIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."