

N. C. ODDO.  
 AUTOMOBILE HORN.  
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1,066,038.

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Fig. 1.

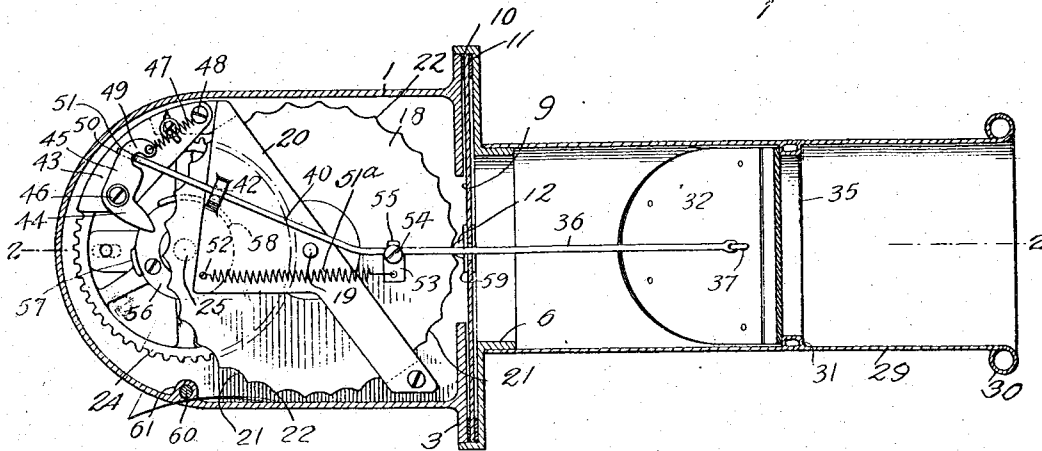


Fig. 2.

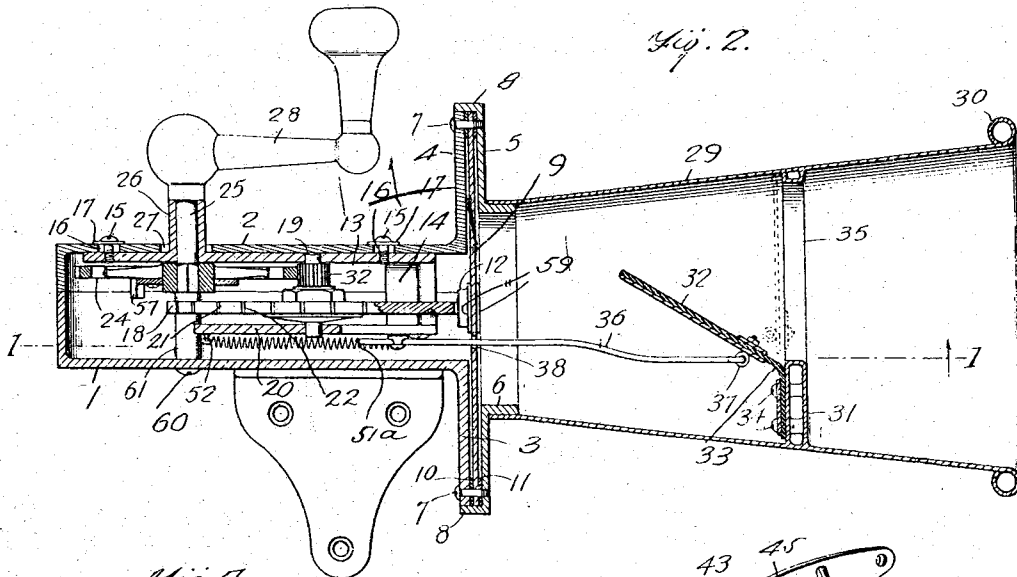
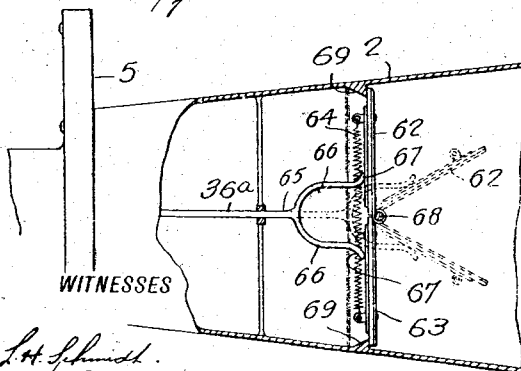
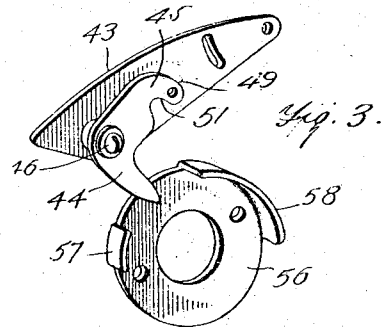


Fig. 4.



INVENTOR

NICOLL C. ODDO

BY *Munn & Co.*

ATTORNEYS

*L. H. Schmidt.*  
*O. E. Tramor*

# UNITED STATES PATENT OFFICE.

NICOLL C. ODDO, OF MIDDLETOWN, NEW YORK.

## AUTOMOBILE-HORN.

1,066,038.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, NICOLL C. ODDO, a citizen of the United States, and a resident of Middletown, in the county of Orange and State of New York, have invented certain new and useful Improvements in Automobile-Horns, of which the following is a specification.

My invention is an improvement in automobile horns, and has for its object the provision of mechanism for initiating a series of rapidly succeeding air vibrations, together with mechanism for controlling and modulating the vibrations to produce sound waves resembling the human voice as it is modulated by the lips.

In the drawings:—Figure 1 is a section on the line 1—1 of Fig. 2, Fig. 2 is a section on the line 2—2 of Fig. 1, Fig. 3 is a detail perspective view of the valve actuating mechanism, and Fig. 4 is a transverse section of the intensifier showing a modified form of valve.

In the present embodiment of the invention, a two part casing is provided, consisting of the sections 1 and 2, each of the said sections being approximately cup shaped and fitting at its edges against the other section. Each section 1 and 2 is provided with a lateral flange 3 and 4 respectively, and a disk 5 having a central laterally extending nipple 6 is secured to the flanges by means of screws 7.

The disk 5 is provided with a lateral marginal flange 8 extending in the opposite direction to the nipple 6, and the said flange fits outside of the flanges 3 and 4 of the casing sections. A diaphragm 9 is arranged between the disk 5 and the flanges 3 and 4, the said diaphragm extending across the opening at that end of the casing 1—2 adjacent to the disk 5, and the said diaphragm 9 is held in place by the screws 7 before mentioned. Gaskets 10 and 11 are arranged on opposite sides of the diaphragm between the flanges 3 and 4 and the disk 5, and a lug or projection 12 is secured to the center of the diaphragm, the said lug being rounded from side to side as shown more particularly in Fig. 1.

A supporting frame consisting of a base 13 and laterally extending arms 14 is adjustably secured to the casing section 2, by means of screws 15, which are passed through enlarged openings 16 in the casing section, and are threaded into the base 13 to adjustably

hold the said base to the casing section 2. The enlarged openings 16 are provided to permit adjustment of the supporting frame toward and from the diaphragm. A washer 17 is arranged between the head of each of the screws 15 and the outer face of the casing section 2 to cover the openings 16 whatever the position of the supporting frame 13.

A disk or wheel 18 is secured to a stub shaft 19, whose ends are journaled in the base 13 of the supporting frame and in a plate 20 secured to the arms 14 and held in spaced relation by the said arms. The wheel 18 is provided with a plurality of arc-shaped cuts or notches 21, and the junction of the said cuts or notches form teeth 22, the said teeth being adapted to engage the lug 12, before mentioned, to produce a succession of vibrations of the diaphragm when the wheel is turned.

A pinion 32 is secured to the stub shaft 19, and the said pinion is in mesh with a gear wheel 24 on an operating shaft 25, which is journaled in a bushing 26, extending laterally from the base 13 of the supporting frame through an opening 27 in the section 2. The opening 27 is of greater diameter than the bushing, so that the bushing will not interfere with the adjustment of the supporting frame, before mentioned. A crank 28 is secured to the shaft 25 at the outer end of the bushing and it will be evident that when the crank is turned, the wheel 18 will be rotated rapidly to produce a series of rapid contacts between the teeth 22 and the lug 12, whereby to vibrate the diaphragm 9.

An intensifier in the shape of a horn 29 of tapering form, and of suitable material as for instance metal, has its inner end engaged with the nipple 6, the said inner end being slipped outside of the nipple to hold the horn in place. The outer end of the horn is provided with a bead 30 for stiffening the same, and an annular frame 31 is arranged transversely of the horn somewhat nearer the outer end than the inner. A valve 32 is hinged to the frame by means of a hinge 33 of rubber, a portion of the said hinge being secured to the frame by screws 34, and the other portion being secured to the valve 32. It will be noted from an inspection of Fig. 2 that the opening 35 of the annular frame is eccentric to the horn, and that the valve 32 at its free edge will rest upon the inner face of the frame when the

valve is closed. Mechanism is also provided for opening and closing the valve at regular intervals, the said mechanism comprising a rod or link 36, connected at one end to an eye 37 on the valve, and moving through an opening 38 in the diaphragm 9. The upper end of the rod or link is bent angularly as indicated at 40 in Fig. 1, and the said portion slides through a bearing 42 on the plate 20, before mentioned. An extension plate 43 is arranged at the end of the casing 1—2 remote from the diaphragm 9; and the elbow lever 44—45 is pivoted at 46 to the said extension plate. A coil spring 47 has one of its ends connected with the screw 48 that holds the extension plate to the base 13 of the supporting frame and its other end is connected to a lug 49 on the arm 45 of the elbow lever.

The portion 40 of the rod is provided at its upper end with a lateral arm 50 that engages a notch 51 in the arm 45 in such manner that when the elbow lever is swung in a manner to be presently described, the rod is forced downwardly to close the valve 32. The rod is moved upwardly by means of a coil spring 51<sup>a</sup> having its upper end connected to a pin 52 on the plate 20 and its lower end connected to one end of an arm 53, secured to the rod by means of a screw 54. The outer end of the arm is bent laterally as shown at 55 and the rod is engaged between the lateral lug 55 and the head of the screw 54.

A cam wheel 56 is secured to the shaft 25 on the inner side of the gear wheel 24, and the said cam wheel is provided with two laterally bent cam portions or lugs 57 and 58, the portion 58 being of greater extent than the portion 57. The said portions or lugs of the cam are designed to engage the end of the arm 44 to swing the elbow lever 44—45 on its pivot 46 whereby to force the rod 36—40 downwardly to close the valve 32.

The lug 12 is provided with oppositely arranged washers 59, a washer being arranged on each side of the diaphragm, and the sections 1—2 of the casing are held together by a screw 60, the said screw passing through lugs 61 on the inner side of the section.

In operation, when the crank 28 is rotated, the gear wheel 24 will rotate the shaft 19 through its connection with the pinion 23. The toothed wheel 18 will also be rotated rapidly, and the teeth by their engagement with the lug 12 of the diaphragm 9 will produce a series of rapidly succeeding vibrations of the diaphragm. The vibrations of the diaphragm will set up a series of air vibrations which when they impinge upon the ear will be transformed into sound. The cam portions of the cam wheel 56 will cause the valve to be opened and closed, thus modulating the sound, in somewhat the same

manner as the lips modify speech. By loosening the screws 15, the toothed wheel 18 may be adjusted toward and from the diaphragm to vary the extent of the vibrations of the same. It will be evident that the farther the diaphragm must move away from the wheel to permit the teeth 22 to pass, the stronger will be the vibration.

In Fig. 4, a modified form of valve is shown. The said valve consists of two sections 62 and 63, held normally in the position shown by means of a spring 64. The rod 36<sup>a</sup> corresponding to the rod 36 of Figs. 1 and 2 is provided at its lower end with a fork 65, and each of the arms 66 of the fork is provided with a laterally extending portion 67 adapted to bear against one of the sections 62 or 63 of the valve. The sections are hinged at 68 to each other, and to the horn or intensifier. The spring 64 normally holds the valve sections in the same plane, with their free edges resting upon the rib or shoulder 69, and it will be evident that when the rod is moved toward the valve, the sections 62 and 63 will be moved toward each other as shown in dotted lines to open the bore of the intensifier.

I claim:—

1. A device of the character specified, comprising a casing having at one end an opening and having a laterally extending flange at the opening, a plate provided with a central nipple registering with the opening, an intensifying horn having one end engaged with the nipple, a diaphragm arranged between the plate and the flange and extending across the opening of the nipple, said diaphragm having a transversely rounded lug on its inner face, a disk mounted to rotate in the casing, said disk having teeth for engaging the lug to vibrate the diaphragm when the disk is rotated, a frame arranged transversely of the intensifying horn and provided with an eccentric opening, a valve hinged to the frame at one side and adapted to close the opening, a rod connected with the valve at one end, an elbow lever arranged adjacent to the toothed disk, the rod having an angular portion engaging one of the arms thereof, a spring normally holding the valve open, a cam wheel having cam portions for engaging the other arm of the elbow lever to move the rod against the resistance of the spring, a pinion co-axial with the disk and secured thereto, a gear wheel journaled in the casing and engaging the pinion, and a crank outside of the casing connected to the gear wheel for turning the same, the cam wheel being secured to the gear wheel co-axial therewith.

2. A device of the character specified, comprising a casing having at one end an opening and having a laterally extending flange at the opening, a plate provided with

a central nipple registering with the opening, an intensifying horn having one end engaged with the nipple, a diaphragm arranged between the plate and the flange and extending across the opening of the nipple, said diaphragm having a transversely rounded lug on its inner face, a disk mounted to rotate in the casing, said disk having teeth for engaging the lug to vibrate the diaphragm when the disk is rotated, a frame arranged transversely of the intensifying horn and provided with an eccentric opening, a valve hinged to the frame at one side and adapted to close the opening, a rod connected with the valve at one end, an elbow lever arranged adjacent to the toothed disk, the rod having an angular portion engaging one of the arms thereof, a spring normally holding the valve open, a cam wheel having cam portions for engaging the other arm of the elbow lever to move the rod against the resistance of the spring, and a common means for rotating the disk and the cam wheel.

3. A device of the character specified, comprising a casing having an opening, a diaphragm secured across the opening and provided on its inner face with a lug at approximately the center of the said face, a toothed wheel journaled in the casing adjacent to the diaphragm and in position for the teeth to engage the lug when the wheel is rotated, means for rotating the wheel, an intensifier at the opening, and means in the intensifier for modulating the air vibrations set up by the diaphragm, said means comprising a valve arranged transversely of the intensifier, an elbow lever pivoted in the casing and having one arm connected with the valve for opening and closing the same when the lever is rocked, a spring normally holding the valve open, and means operated by the wheel rotating means for closing the valve at predetermined intervals and for varying periods of time.

4. A device of the character specified, comprising a casing having an opening, a diaphragm secured across the opening and provided on its inner face with a lug at approximately the center of the said face, a toothed wheel journaled in the casing adjacent to the diaphragm and in position for the teeth to engage the lug when the wheel is rotated, means for rotating the wheel, an intensifier at the opening, and means in the intensifier for modulating the air vibrations set up by the diaphragm, said means comprising a valve arranged transversely of the intensifier, a spring normally holding the valve open, and means operated by the wheel rotating means for closing the said valve at predetermined intervals and for varying lengths of time.

5. A device of the character specified, comprising a casing having an opening, a dia-

phragm secured across the opening and provided on its inner face with a lug at approximately the center of the said face, a toothed wheel journaled in the casing adjacent to the diaphragm and in position for the teeth to engage the lug when the wheel is rotated, means for rotating the wheel, an intensifier at the opening, and means in the intensifier for modulating the air vibrations set up by the diaphragm, said means being operated by the wheel rotating means.

6. A device of the character specified, comprising a casing having an opening, a diaphragm secured across the opening and provided on its inner face with a lug at approximately the center of the said face, a toothed wheel journaled in the casing adjacent to the diaphragm and in position for the teeth to engage the lug when the wheel is rotated, means for rotating the wheel, and means operated by the wheel rotating means for modulating the air vibrations set up by the diaphragm.

7. In a device of the character specified, a diaphragm provided with a lug on one face, a disk having teeth for engaging the lug, means for rotating the disk, and means for modulating the air vibrations set up by the diaphragm, said means comprising an intensifier, a valve in the same, and means operated by the disk rotating means for closing the said valve at predetermined intervals for varying lengths of time.

8. In a device of the character specified, a diaphragm provided with a lug on one face, a disk having teeth for engaging the lug, means for rotating the disk, and means for modulating the air vibrations set up by the diaphragm, said means comprising an intensifier, and means operated by the disk rotating means for occluding the intensifier at predetermined intervals and for varying lengths of time.

9. In a device of the character specified, a diaphragm provided with a lug on one face, a disk having teeth for engaging the lug, means for rotating the disk, and means operated by the disk rotating means for modulating air vibrations set up by the diaphragm.

10. A device of the character specified, comprising a casing having at one end an opening and having a laterally extending flange at the opening, a plate provided with a central nipple registering with the opening, an intensifying horn having one end engaged with the nipple, a diaphragm arranged between the plate and the flange and extending across the opening of the nipple, said diaphragm having a transversely rounded lug on its inner face, a disk mounted to rotate in the casing, said disk having teeth for engaging the lug to vibrate the diaphragm when the disk is rotated, means for rotating the disk, a supporting frame in

which the disk and the rotating means are mounted, means for adjusting the said frame toward and from the diaphragm, and means operated by the disk rotating means for modulating the air vibrations, set up by the diaphragm.

11. A device of the character specified, comprising a casing having an opening, a diaphragm arranged transversely of the opening, means in the casing for vibrating the diaphragm, an intensifier on the opposite side of the diaphragm from the casing, and means operated by the diaphragm vibrating

means for modulating the air vibrations produced by the diaphragm.

12. A device of the character specified, comprising a casing having an opening, a diaphragm at the opening, means in the casing for vibrating the diaphragm, and means operated by the said vibrating means for modulating the air vibrations produced by the diaphragm.

NICOLL C. ODDO.

Witnesses:

C. E. TRAINOR,  
SOLON C. KEMON.

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