R. E. LONG.

AUTOMOBILE HORN.

APPLICATION FILED JAN. 9, 1911.

1,019,673.

Patented Mar. 5, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

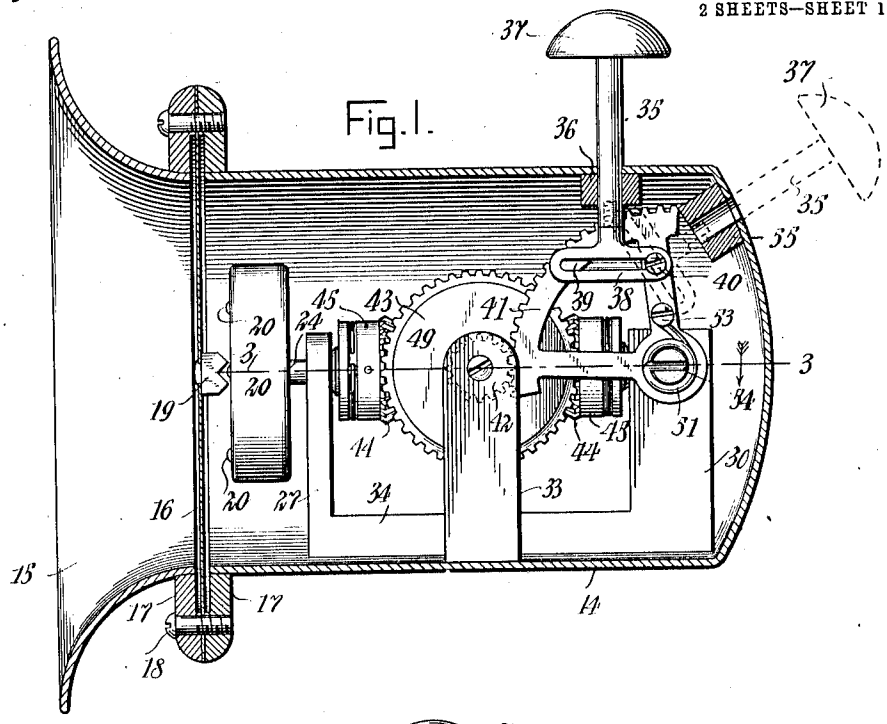
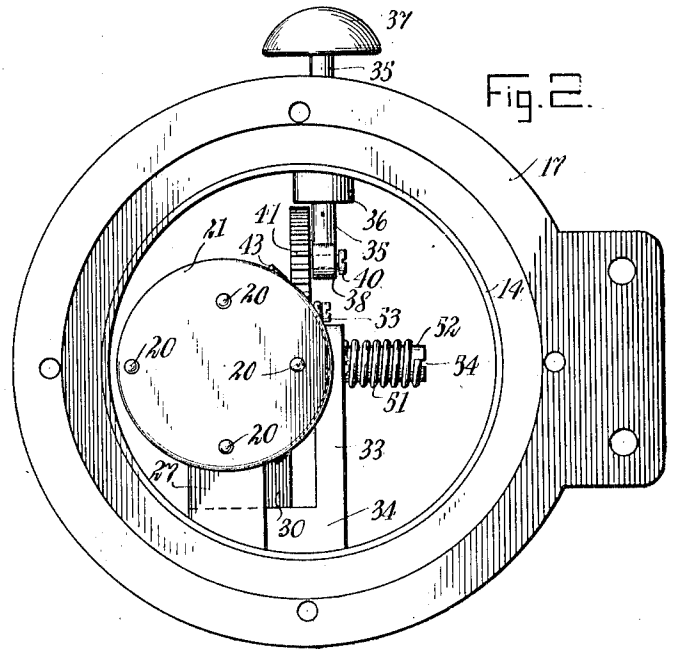


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

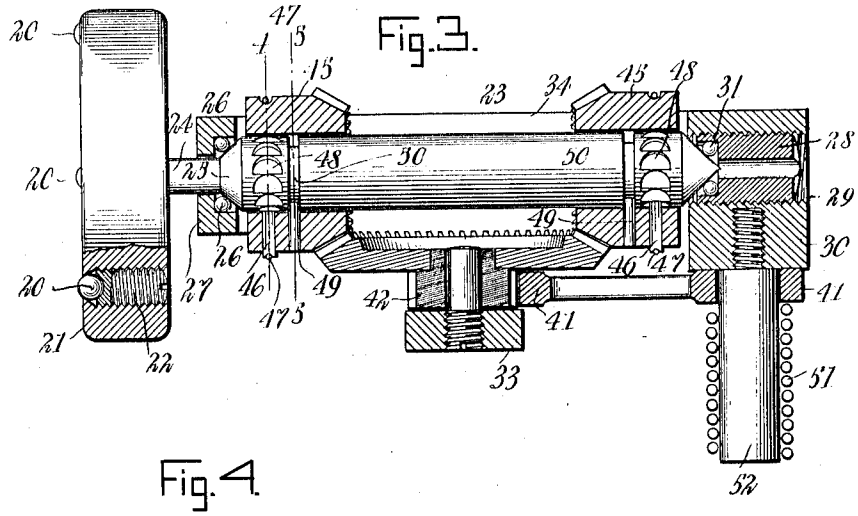


Fig. 4.

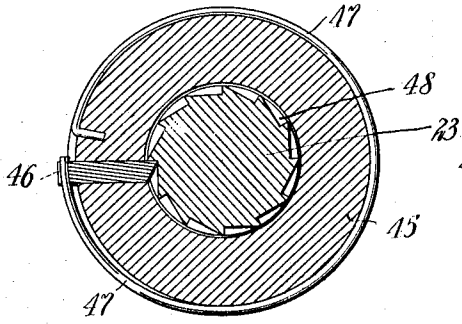


Fig. 5.

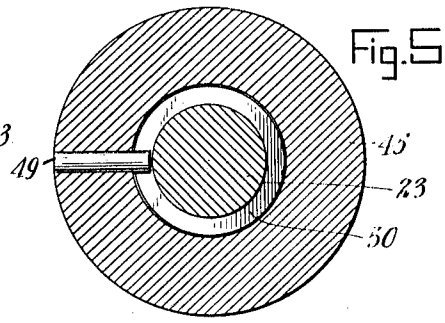


Fig. 6.

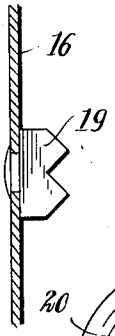


Fig. 7.

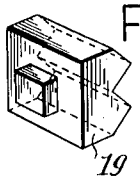


Fig. 9.

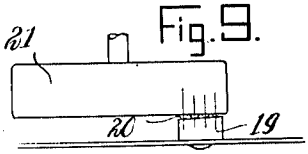
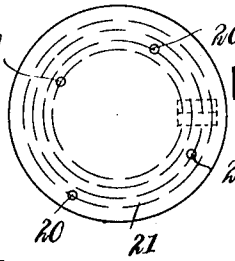


Fig. 8.



WITNESSES

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UNITED STATES PATENT OFFICE.

ROBERT E. LONG, OF NEW YORK, N. Y.

AUTOMOBILE-HORN.

1,019,673. Specification of Letters Patent. Patented Mar. 5, 1912.

Application filed January 9, 1911. Serial No. 601,612.

To all whom it may concern:

Be it known that I, ROBERT E. LONG, a citizen of the United States, and a resident of the city of New York, borough of the Bronx, in the county and State of New York, have invented a new and Improved Automobile-Horn, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to provide a hand-operated mechanism for vibrating the diaphragm of a mechanically operated horn, said mechanism being arranged to affect a continuous sound; to provide a picker device for the picker tooth of a diaphragm adapted to wear said tooth evenly and to extend the area thereof; to provide means for varying the tone and intensity of the sound produced by the horn; and to reduce the wear on the pickers.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a vertical longitudinal sectional view of a horn constructed and arranged in accordance with the present invention; Fig. 2 is an end view of the horn, the bell mouth and diaphragm being removed; Fig. 3 is a longitudinal horizontal section, taken on the line 3—3 in Fig. 1; Fig. 4 is an enlarged detail view in cross section, taken on the line 4—4 in Fig. 3; Fig. 5 is an enlarged detail view in cross section, taken on the line 5—5 in Fig. 3; Fig. 6 is an enlarged detail view, showing a fragment of the diaphragm and a double picker tooth mounted thereon; Fig. 7 is a detail view in perspective of the double picker tooth employed by me in the present invention; and Figs. 8 and 9 are diagrammatic views showing the relation of the paths of the vibratory pickers in connection with the picker tooth.

As shown in the drawings, the horn is provided with a body portion 14, a bell mouth 15 and a diaphragm 16. The body portion 14 and the bell mouth 15 are provided with bolting flanges 17, 17 adapted to receive screws 18, and to clamp in holding relation between the said flanges the diaphragm 16. This construction is in all essential respects the same as that now known in the art. The diaphragm as at present constructed is provided with a picker tooth having a single projection and extended within the chamber formed by the body of the horn. In the present invention this is varied in that I employ a picker tooth which is provided with a double extension spaced apart to conform with the oscillation of the diaphragm and of the tooth bearing section thereof.

In the present condition of the art various devices have been employed, such as star wheels or other similar contrivances, for striking upon to deflect the tooth 19 to cause the same to pulsate the air contained within the bell mouth, and to vibrate the bell mouth structure in harmony, and thus produce sound waves emanating from the said horn or the bell mouth thereof.

In the present invention the pickers 20, 20 consist of small steel balls which are extended from the face of a relatively heavy rotary disk 21, as seen best in Fig. 3 of the drawings. The projection of the pickers 20 beyond the face of the disk 21 is governed by the area of the perforations opening therefrom. The perforations are tapered or cut, as shown in Fig. 3, the opening through the surface of the disk being the contracted end of the cup or cone for receiving the picker. In each perforation is formed a screw thread, being provided to receive a screw 22, the end whereof is cupped to form a seat for the picker 20. By reason of this arrangement, as each of the pickers 20 strikes the picker tooth 19, the stroke being off the rotary center of the picker, the picker is slightly rotated. In this manner there is constantly presented for impact upon the picker tooth a different portion of the surface of the said picker. Due to the fact that the longitudinal extension of the tooth is not parallel with the radii of the disk, an axial rotation is also produced on the picker. The result of the two rolling actions on the pickers is that the entire spherical surface of each of the pickers is presented for impact upon the tooth 19.

By reference to Fig. 8 of the drawings it will be seen that the disposition of the pickers 20 is such that each strikes upon a different portion of the surface of the tooth. In this manner the central grooving of the tooth so common to devices of this character is avoided, the wear being distributed over a greater area on the tooth 19. It will be understood that these parts are not rigidly

accurate in their relation, and the variation of position is sufficient to break down any intermediate walls between the paths formed by the said pickers. By the employment of pickers which are doubled, as shown best in Figs. 6 and 7 of the drawings, the double impact is imparted by each of the pickers in its passage over the said tooth, thus increasing the volume of the sound produced.

The disk 21 is rigidly mounted upon a shaft 23. The shaft 23 is reduced at the forward end to form an extension 24 to which the disk 21 is directly connected. Intermediate the main shaft 23 and the extension 24 is formed a cone 25 to bear upon the balls 26, 26 which constitute the bearing for the said shaft. The race for the balls 26 is formed in a bracket 27 and in the end of an adjustment screw 28. The adjustment screw 28 is extended through a threaded perforation 29 formed in a bracket 30. The balls 31 mounted in the recess formed in the screw 28 receive the cone 32 of the shaft 23 to form a combined supporting and thrust bearing for the said shaft 23. The brackets 27 and 30, as well as the bracket 33, are integrally formed and extended upward from a base plate 34, the under side whereof is shaped to conform to the interior of the body portion 14 to which it is rigidly secured. The shaft 23 is rotated when the plunger 35 is reciprocated, the rotation of the said shaft being constant in one rotary direction during the depression as well as the lift of the said plunger 35. The plunger 35 is guidably mounted in a perforation formed in the block 36, and is provided at the upper end with a hand button 37 and at the lower end with an elongated attachment loop 38. In the loop 38 is formed a slot 39 to receive in sliding relation therein a sliding pin screw 40. The depression of the plunger 35 results in the rotation or rocking of a gear segment 41. The segment 41 is tooth engaged with a pinion 42. The pinion 42 is rigidly connected with a large bevel gear wheel 43 in the manner as shown best in Fig. 3 of the drawings. The bevel gear wheel 43 is tooth engaged with the bevel gear wheels 44, the teeth whereof are formed on the barrel hubs 45 provided on each of the wheels 44. The wheels 44, 44 are loosely mounted on the shaft 23, and are operatively connected with said shaft to move in the same rotary direction by means of ratchet pins 46, 46. The pins 46, 46 are extended through the hubs 45 and are seated by springs 47, 47. The pins 46, 46 are alined with the tooth-like indentations 48, 48, the pitch whereof at both ends of the shaft 23 is in the same direction. The indentations are inclined backward to avoid the said pins when the shaft is rotating in a direction relatively opposite to the rotary direction of either of the said wheels 44. The wheels 44 are maintained from shifting on the shaft 23 by means of guide pins 49, 49. The pins 49, 49 extend into annular grooves 50, 50 with which the said shaft is provided.

By reason of the arrangement whereby the wheel 43 engages on opposite sides of its rotary center the wheels 44, 44, opposite rotary directions are simultaneously imparted to the said wheels. This results in that when one of the said wheels 44 is rotated in the designed rotary direction of the shaft 23 it engages, by means of the ratchet pin 46 with which it is provided, the indentations 48 and rotates the said shaft 23. At the same moment the wheel 44 at the opposite end of the shaft 23 is rotating in the opposite direction, the pin 46 rotating backward over the indentations, permitting the shaft to rotate freely within the said wheel. When, however, the wheel 46 is reversed in its rotary direction the disengaged wheel of the former action engages the shaft 23 to continue or maintain the rotation thereof formerly imparted by the wheel 44 at the opposite end of the shaft.

The segment 41 is lifted after being depressed by the plunger 35, lifting therewith the said plunger by means of a coiled spring 51. The coiled spring 51 is rotated upon the guide pin 52, which guide pin forms a bearing for the segment 41. The free end of the spring 51 is anchored by means of a screw pin 53 to the segment 41, while the opposite end of the said screw is extended through a slot 54 formed in the end of the guide pin 52. Thus it will be seen that when the operator, by placing his hand or foot upon the button 37, depresses the plunger 35, he thereby rotates the disk 21, causing the pickers 20 mounted thereon to successively and rapidly impinge upon the tooth 19 to vibrate the diaphragm 16. Further, when the operator releases the plunger 35 the spring 51 lifts the same, reversing the rotation of the transmission gear wheel, the disk 21 continuing the effect upon the diaphragm and producing thereby a constant series of sound waves. These operations of the plunger may be so closely allied as to form a continuous blast.

I have shown in Fig. 1 of the drawings, and in dotted lines thereon, an alternative operation position for the plunger 35 and the button 37. It is to provide for mounting the plunger in this manner that I have provided a second block 55. It will be understood in this connection that the construction and arrangement of the plunger 35 may be extensively varied, and that there may be substituted for the said plunger any convenient form of hand operated mechanism.

In some instances I incline the upper edge

of the tooth 19 to vary the degree of the extension of the said tooth within the path of the pickers 20, 20. The object in so constructing the teeth is to form a variation in the extent of the vibration of the diaphragm produced by the various pickers, and to further vary the intensity of the impact of the pickers on the said tooth. In doing this I accomplish two purposes; first, I form a wailing tone in the sound produced on the diaphragm; second, I produce a wave-like effect in the cicada-like sounds produced in horns of this character. The combined result of these two effects is peculiar to the present instrument.

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

1. An automobile horn, comprising a diaphragm; an elongated projection rigidly mounted on said diaphragm at near the center thereof; a rotary member having a plurality of extensions adapted to impinge upon said projection at different portions of the area thereof; and means for rotating said rotary member.

2. An automobile horn, comprising a diaphragm; an elongated projection rigidly mounted on said diaphragm at near the center thereof; a rotary wheel disposed adjacent said diaphragm; a plurality of extended tooth-like members adapted to impinge upon said projection at different sections of the length of said projection; and means for rotating said wheel.

3. An automobile horn, comprising a diaphragm; an elongated projection rigidly mounted on said diaphragm at near the center thereof; a weighted wheel disposed adjacent said projection having a surface corresponding with said projection; a plurality of striker members mounted on said wheel at intervals circularly disposed, said striker members being arranged to impinge upon the said projection at different sections of its area; and means for rotating said wheel.

4. An automobile horn, comprising a diaphragm; an elongated projection rigidly mounted on said diaphragm at near the center thereof; a weighted disk disposed approximately parallel with said diaphragm and eccentric thereto; a plurality of striker members extended from the surface of said disk to impinge upon said projection, each of said striker members being arranged to impinge upon a different section of said projection; and means for rotating said disk.

5. An automobile horn, comprising a diaphragm; an elongated projection rigidly mounted on said diaphragm at near the center thereof; a weighted rotary disk disposed in parallel relation to said diaphragm and having a series of perforations formed therein at intervals thereon, said perforations being removed from the center of said disk and each at a different distance therefrom; a plurality of striker balls rotatively mounted in said perforations adapted to strike on said projection when said disk is rotated; a plurality of seat devices for said balls disposed in said perforations to hold the said balls in position; and means for rotating said disk.

6. An automobile horn, comprising a diaphragm; an elongated projection rigidly mounted on said diaphragm at near the center thereof; a weighted rotary disk disposed in parallel relation to said diaphragm and having a series of screw threaded perforations formed therein at intervals thereon, said perforations being removed from the center of said disk and each at a different distance therefrom; a plurality of striker balls rotatively mounted in said perforations adapted to strike on said projection when said disk is rotated; a plurality of screws registered with the threads in said perforations and having cup-shaped ends to form seats for said balls to regulate the projection of the said balls beyond the surface of said disk; and means for rotating said disk.

7. An automobile horn, comprising a diaphragm; an elongated projection rigidly mounted on said diaphragm at near the center thereof; a weighted disk disposed approximately parallel with said diaphragm and eccentric thereto; a plurality of striker members extended from the surface of said disk to impinge upon said projection, each of said striker members being arranged to impinge upon a different section of said projection; means for rotating said disk, including a reversibly rotating driving wheel and a driven shaft rigidly connected to said disk; and a translating mechanism connecting said wheel and said shaft for continuously operating said shaft in one rotary direction.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT E. LONG.

Witnesses:
E. F. MURDOCK,
PHILIP D. ROLLHAUS.