A. N. PIERMAN.

ALARM.

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Fig. 1

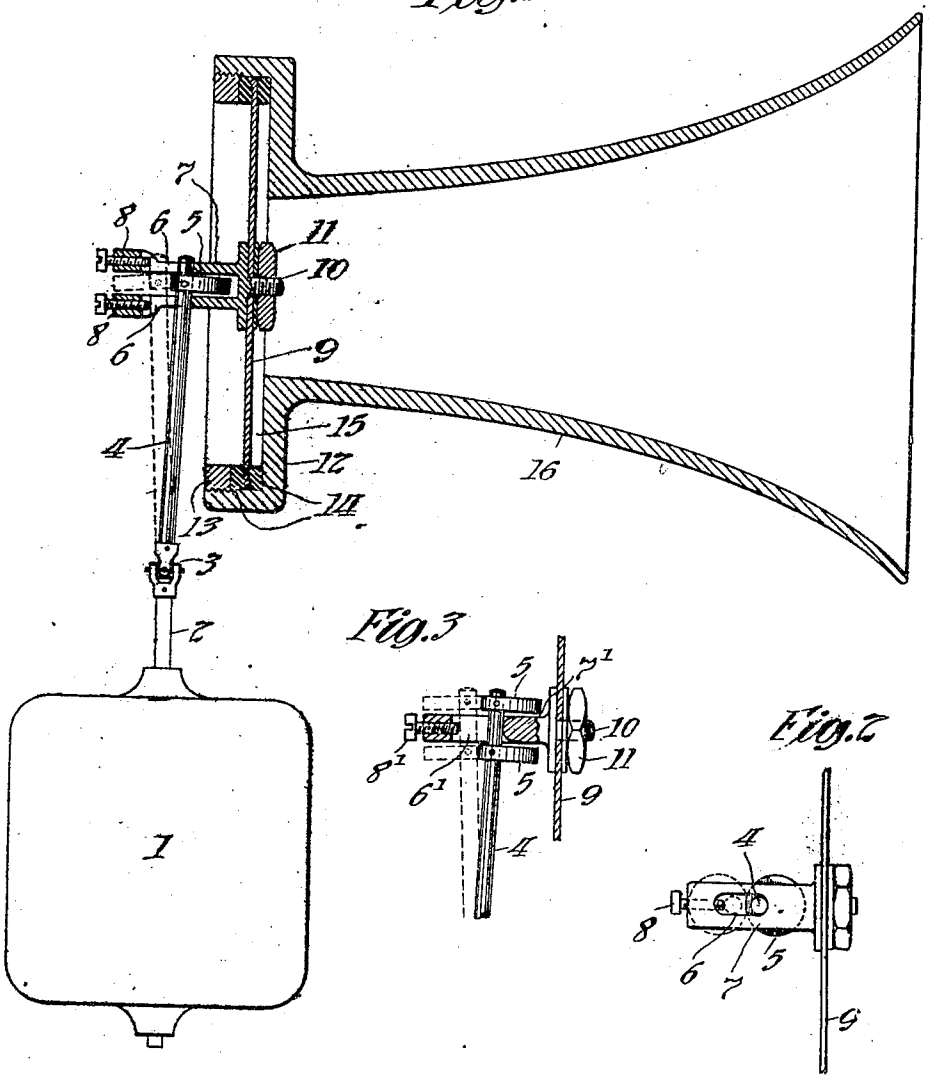


Fig. 3

Fig. 2

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UNITED STATES PATENT OFFICE.

ALEXANDER N. PIERMAN, OF NEWARK, NEW JERSEY.

ALARM.

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To all whom it may concern:

Be it known that I, ALEXANDER N. PIERMAN, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have made a certain new and useful Invention in Alarms, of which the following is a description.

My invention relates to alarms adapted more particularly for use on vehicles such as automobiles, street cars, etc., to give warning of the approach thereof, and in which a diaphragm or other vibratory means is caused to vibrate so as to produce a loud sound, an amplifier being preferably used for strengthening the same.

According to my invention, a rotary member which may be driven by an electric motor is caused to impart rapidly recurring hammer blows to the vibratory means, the arrangement being such that a minimum amount of energy is required to produce the desired result.

My invention consists of the features hereinafter set forth and claimed, and in order that the same may be more fully understood, reference is hereby made to the accompanying drawing of which—

Figure 1 is a side elevation, partly in section, of an apparatus embodying my invention; Fig. 2 is a plan of the upper end of the rotary hammer and parts associated therewith; and Fig. 3 is a side elevation, partly in section, of a modification of the invention.

Referring to Fig. 1, the motor 1, which may be a small electric motor capable of being driven by one or two dry cells, is provided with the usual armature shaft 2 upon the upper end of which, and connected thereto by a universal joint 3, is an extension 4 which acts as a hammer. A weight 5 is fixed to the extension 4 near its upper end, said weight being applied eccentrically with respect to the axis of rotation of said extension so as to unbalance the same and cause it, when rapidly rotated, to oscillate with considerable violence to and fro within the slot 6 formed in the block or anvil 7 and deliver hammer blows alternately upon one end of the slot and upon the adjusting screws 8, which are threaded in said block adjacent the other end of said slot. The strength or intensity of the blows thus delivered may be controlled and regulated by varying the positions of said screws 8, the shortening of the path traveled by the extension 4 causing a weakening of the blows delivered thereby.

The anvil block 7 is secured directly to the center of a diaphragm 9, preferably of steel, by means of the threaded stud 10 and nut 11. The diaphragm 9 is clamped within the body 12 by means of a ring 13 threaded in said body, brass rings 14 being mounted on either side thereof, as shown. A resonance chamber 15 is formed in said body adjacent the diaphragm and an amplifying horn 16 communicates therewith.

The device shown is operated as follows: The motor controlling circuit being closed by a suitable push button or switch, the motor shaft 2, and extension 4 are caused to rotate at a rapid rate, whereby the latter delivers hammer blows in alternate directions with respect to the anvil block 7 thereby causing the diaphragm to be powerfully actuated and producing an extremely loud and continuous roar as long as the circuit is closed. Upon opening the circuit the motor stops and the sound ceases.

Many modifications of my invention will be apparent, the essential feature being the provision of means for delivering rapid hammer blows with respect to the vibratory means.

In the device of Fig. 3, the anvil block 7′ is provided with a slot 6′ arranged in alinement with the axis of the diaphragm. An adjustable screw 8′ limits the outward movement of the hammer 4. Eccentrically mounted weights 5′ are secured to the hammer above and below the anvil block, the latter being secured to the center of the diaphragm 9 by the stud 10 and nut 11. The method of operation of this device is the same as that of Figs. 1 and 2. The structure of Fig. 3 possesses the advantage that the impact of each blow of the hammer is delivered in the direction of the axis of the diaphragm whereby lateral stresses and distortion of the diaphragm are avoided and its life prolonged.

What I claim is:

1. In an alarm, an unbalanced rotary member, a vibratory member, and stationary guiding means for causing the rotary member to oscillate in a plane and deliver hammer blows with respect to the vibratory member, substantially as described.

2. In an alarm, a vibratory member,

means including an oscillatory rotary hammer and a guide to constrain said hammer from movement in certain directions and to permit the same to oscillate in a plane substantially perpendicular to the plane of the vibratory member and deliver blows with respect thereto at rapidly recurring intervals and alternately in opposite directions, and means for rotating said hammer, substantially as described.

3. In an alarm, an oscillatory diaphragm, a rotary member, means for rotating the same, means for causing the same to oscillate in a plane during rotation, and an anvil for receiving blows from said rotary member and transmitting same to said diaphragm, substantially as described.

4. In an alarm, an unbalanced rotary member, means for driving the same, vibratory means, and a connection between said vibratory means and said rotary member which causes the latter to deliver hammer blows with respect to the former, substantially as described.

5. In an alarm, a rotary member carrying a weight eccentric thereto, means for driving the same, vibratory means, and a connection between said vibratory means and said weighted member which receives hammer blows from the latter and transmits the same to said vibratory means, substantially as described.

6. In an alarm, an unbalanced rotary shaft having a weight eccentric thereto, vibratory means, a slotted block connected thereto, said shaft being so mounted as to oscillate within said slot and deliver blows alternately in opposite directions with respect thereto, substantially as described.

7. In an alarm, an unbalanced rotary shaft having a weight eccentric thereto, vibratory means, a slotted block connected thereto, said shaft being so mounted as to oscillate within said slot and deliver blows alternately in opposite directions with respect thereto, and one or more adjusting screws for receiving the hammer-blows and varying the intensity thereof, substantially as described.

8. In an alarm, a rotary shaft, an oscillatory extension connected thereto by a pivotal joint so as to be laterally movable out of alinement therewith, a slotted block which receives the free end of said extension, and vibratory means connected to said block, substantially as described.

9. In an alarm, an electric motor including an armature shaft, an oscillatory extension jointed to said shaft so as to be laterally movable out of alinement therewith, a slotted member which receives the free end of said extension and vibratory means secured to said slotted member, substantially as described.

10. In an alarm, a vibratory member, a rotary hammer, means including a stationary guide for causing said hammer to oscillate in a plane and deliver blows with respect to the vibratory member, and an adjustment for varying the intensity of the hammer blow, substantially as described.

11. In an alarm, a vibratory member; a rotary hammer, means including a stationary guide for causing said hammer to oscillate in a plane and deliver blows with respect to the vibratory member, and means for varying the distance through which the hammer oscillates, substantially as described.

12. In an alarm, a vibratory member, a rotary hammer, means including a stationary guide for causing said hammer to oscillate in a plane and deliver blows with respect to the vibratory member at rapidly recurring intervals, means for rotating said hammer, and means for amplifying the vibrations of said vibratory member, substantially as described.

13. In an alarm, a diaphragm, a rotary oscillating hammer arranged to deliver hammer blows with respect thereto, the impact of said blows being exerted in a direction which substantially coincides with the axis of the diaphragm, and means for operating said hammer, substantially as described.

14. In an alarm, an electric motor including an armature shaft, an unbalanced member connected thereto so as to be rotated thereby, vibratory means, and guiding means for causing said unbalanced member to oscillate and to deliver hammer blows with respect to said vibratory means, substantially as described.

15. In an alarm, the combination of a diaphragm and electrically operated means for actuating the same, comprising an oscillatory rotary hammer, stationary means for guiding said hammer for oscillation in a plane, an electric motor having a rotary armature shaft and a connection between said shaft and said hammer, substantially as described.

16. In an alarm, a vibratory member, an oscillatory rotary hammer, stationary means for guiding said hammer for oscillation in a plane, and electrically operated means for rotating said hammer, substantially as described.

This specification signed and witnessed this 14 day of August 1911.

ALEXANDER N. PHERMAN.

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