A. B. SILVIA.

DIAPHRAGM HORN OPERATING MEANS.

APPLICATION FILED FEB. 28, 1921.

1,384,977. Patented July 19, 1921.

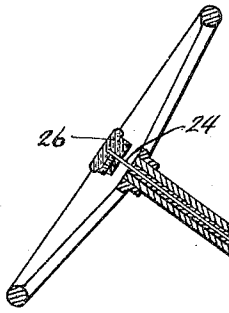


Fig. 1.

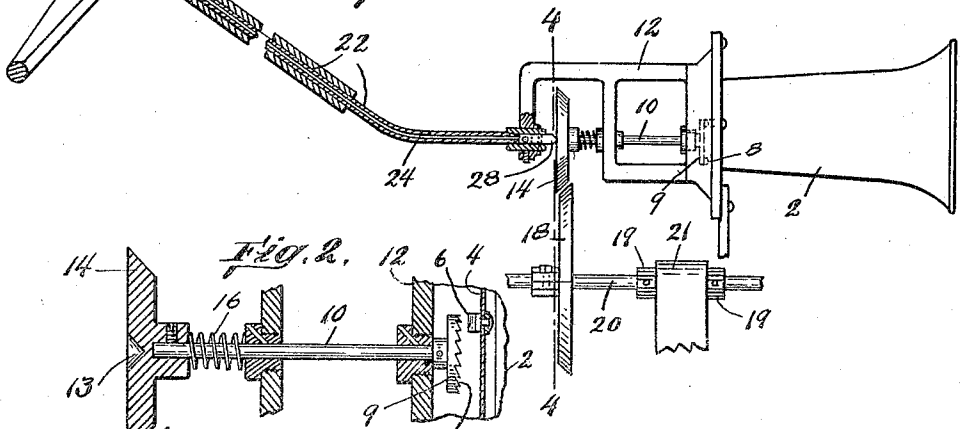


Fig. 2.

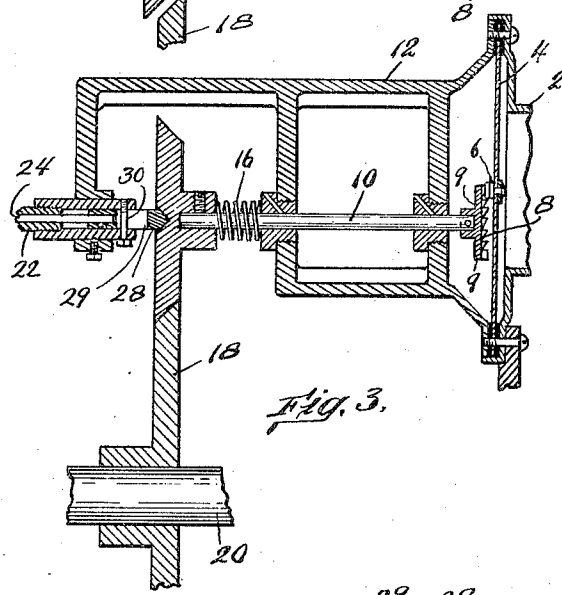


Fig. 3.

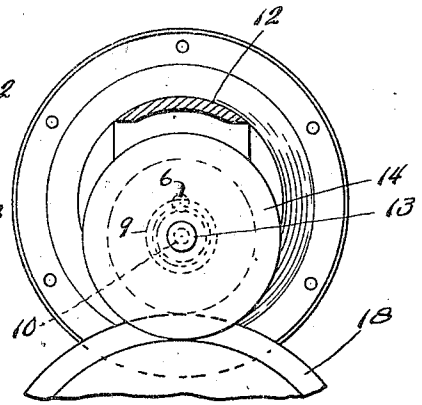


Fig. 4.

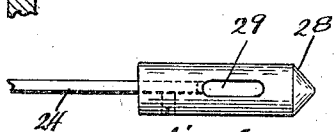


Fig. 5.

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DIAPHRAGM-HORN-OPERATING MEANS.

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To all whom it may concern:

Be it known that I, ANTHONY B. SILVIA, a citizen of the United States, and a resident of Haverhill, county of Essex, State of Massachusetts, have invented an Improvement in Diaphragm-Horn-Operating Means, of which the following is a specification.

This invention relates to that class of audible signals commonly known as diaphragm horns and more particularly to the means for operating the same.

The most satisfactory method of operating signals of this character, which is in general use, is by means of a small electric motor mounted on the striker shaft, although manually actuated push bars are also extensively employed.

The principal advantage of the electrically operated type lies in the fact that it may be operated by a push button, and the principal objection to this type is that they are liable to get out of order, and are expensive to repair.

Various types of "vehicle operated" signals have been produced, but, so far as I am aware a satisfactory means for operating a diaphragm horn from a constantly driven shaft has not been produced, principally because such means have not been adapted for operation with the ease and facility of an electrically operated device.

The objects of my invention are to provide means for operating a diaphragm horn from a constantly driven shaft, which has the same facility of operation, as the electrically operated means above referred to, but which is simple and durable and is adapted for ready adjustment to compensate for wear. Also to provide means for this purpose which is so constructed and arranged that the volume of sound emitted may be directly controlled by the operator, and to provide a means which is adapted to be readily applied to a commercial diaphragm horn, in substitution of the electric motor previously employed.

I accomplish these objects by the means shown in the accompanying drawings in which Figure 1 is a side elevation partly in section, illustrating an embodiment of my invention.

Figs. 2 and 3 are detail views showing the striker shaft out of, and in its operative positions, respectively.

Fig. 4 is a sectional view on line 4—4 of Fig. 1.

Fig. 5 is a detail view of the push-rod engaging head.

In the preferred embodiment of my invention, I employ a well known form of diaphragm horn, comprising a horn 2 having a steel diaphragm 4 therein, in the center of which a sharp projection or button 6 is mounted and arranged to be engaged by a series of striker-teeth 8 mounted on a disk 9, secured on the end of a striker-shaft 10, which is journaled in the supporting frame 12 of the horn.

According to my invention, a beveled-faced friction wheel 14 is mounted on the rear end of the shaft 10, and a coil spring 16 is arranged about the shaft, between said wheel and the frame, and normally acts to slide said shaft rearwardly and hold the hub of the disk 9 against the frame portion in which the shaft 10 is journaled, in which position the teeth 8 will be held just out of contact with the button 6.

A friction wheel 18, having a peripheral face, which is beveled at the same angle as, and at the opposite angle to the face of wheel 14, is mounted on a shaft 20, the latter being any convenient shaft for the purpose, that is, any shaft, which is parallel to the shaft 10 and is constantly rotated by the automobile engine while in operation. The shaft 20 will be held against axial movement by suitable means, indicated by stop collars 19 and bearing 21, and said wheel 18 is split to permit convenient application thereof to the shaft and is adapted to be clamped thereon in any position, so that it may be adjusted longitudinally of the shaft when necessary, the adjusted position of the wheel 18 being such that the wheel 14 will be held just out of contact therewith when the shaft 10 is pushed rearward to the fullest extent by the spring 16, as shown in Figs. 1 and 2.

A tube 22 is mounted, at one end, in the frame 12, in central alinement with shaft 10, and is extended rearward to any convenient point, in proximity to the steering wheel, and a flexible rod 24, having a push button 26 on its rear end adjacent the end of the tube, is arranged to slide longitudinally within the tube. A bearing plug 28, of hard fiber, or other suitable material, is securely attached, at one end to the opposite,

or front end of the rod 24, the opposite end of said plug being conically shaped and adapted, when the rod is pushed longitudinally to enter an axially arranged and correspondingly shaped recess 13, in the adjacent side of the wheel 14, with which said plug is constantly held in axial alinement. A bolt 30 is mounted in the frame in position to engage the plug 28 in a longitudinal slot 29 formed therein, so as to hold the plug against rotation, while permitting the necessary longitudinal movement thereof.

The parts being properly adjusted, the operation is as follows:

As before stated, the wheel 18 is designed to be constantly rotated and the wheel 14 is normally held out of contact with the wheel 18 by the spring 16. When, therefore, the button 26 is pressed, the rod 24 is pushed forwardly forcing the plug 28 against the wheel 14, thereby causing the striker shaft 10 to be slid forwardly, and the wheel 14 to be carried into contact with wheel 18 and also the teeth 8 to be carried forward into position to engage the button 6 on the diaphragm 4, so that, when the friction wheels are engaged, the shaft 10 will be caused to rotate, and the signal will be sounded.

If the pressure on the push rod 24 is comparatively light, the frictional engagement of the wheel 14 with the wheel 18 will be correspondingly slight and consequently there will be a substantial amount of slip between the surfaces of the wheels and the shaft 10 will be driven comparatively slowly. Also the adjustment will be such that the teeth 8 will only lightly engage the diaphragm button and consequently the volume of sound which will be emitted will be relatively low. Increased pressure will therefore produce increased speed of the shaft 10 and increased vibration of the diaphragm, both due to the increased frequency of impact, due to the increased speed, and the increased force of the impact, due to the moving of the teeth into closer proximity to the diaphragm button.

When the pressure on the push rod is released, the spring 16 will immediately move the shaft 10 rearward, carrying the teeth thereon out of contact with the diaphragm and the wheel 14 out of contact with the wheel 18, so that the operation of the signal immediately ceases.

The wheel 18 acts to limit the movement of the shaft 10 toward the diaphragm, and thus prevents the teeth from being moved so close to the diaphragm as to give unsatisfactory results, and, in case either the teeth or diaphragm button become worn, so that the signal does not sound loudly enough it is merely necessary to adjust the wheel 18 forwardly on the shaft 20 to a slight extent, so that the wear may be compensated for.

It is obviously immaterial whether the conical head on the push rod directly engages the shaft 10 or engages it through the wheel 14, as shown, and the particular relative inclination of the contacting faces of the friction wheel is not important, as is also the case with various other features of constructions shown.

I claim:

1. In combination with the diaphragm of a signaling horn, a rotatably mounted striker-shaft axially movable into and out of operative relation with said diaphragm, means for normally holding said shaft in an inoperative position, a friction wheel on said shaft, a power driven shaft having a friction wheel thereon arranged to be engaged by the wheel of said striker shaft as the latter is moved to its operative position and manually operated means for moving said striker shaft toward the diaphragm, to cause operative engagement of said wheels and of said shaft with the diaphragm.

2. In combination with the diaphragm of a signaling horn, a striker shaft rotatably and axially movable into operative engagement therewith, a friction wheel on said shaft, stops for limiting the axial movement of the shaft away from said diaphragm, a spring for holding said stops in engagement, a power driven shaft having a friction wheel mounted thereon arranged to be engaged by the wheel on the striker shaft, as the latter is moved to operative position, to cause rotation of the striker shaft, and manually operated means for moving said striker shaft toward the diaphragm.

3. In combination with the diaphragm of a signaling horn, a striker shaft longitudinally and rotatably movable to engage said diaphragm, means for normally holding said shaft out of engaging position, a friction wheel secured on said shaft, a manually operated push rod arranged to move said shaft into engaging position, and a power driven shaft having a friction wheel secured thereon in position to be engaged by said friction wheel on the striker shaft, to cause rotation of the latter as it is moved into operative position.

4. In combination with the diaphragm of a signaling horn, a rotatable striker-shaft axially movable toward and from the diaphragm, a friction wheel on said shaft having a beveled peripheral face, a power driven shaft, a friction wheel thereon having a peripheral face oppositely beveled with relation to the face of said first named wheel, and arranged to permit operative engagement of said faces with increasing force of frictional contact, as the striker shaft is moved toward the diaphragm, and manually controlled means for moving the striker shaft toward the diaphragm, to vary the speed of the striker shaft and its proximity to the diaphragm correspondingly.

5. In combination with the diaphragm of a signaling horn, a rotatable striker shaft therefor, a friction wheel mounted on said shaft, and arranged for axial movement between an operative and an inoperative position, means for normally holding said wheel in its inoperative position, a manually operated push-rod arranged to be moved longitudinally, with its longitudinal center line coincident with the axial line of said wheel, to be engaged with said wheel to move the same to its operative position, and a power actuated shaft having a friction wheel thereon arranged to be operatively engaged by said axially movable wheel, as the latter is moved to its operative position.

6. In combination with the diaphragm of a signaling horn, a rotatable striker shaft therefor, a friction wheel mounted on said shaft, and arranged for axial movement between an operative and an inoperative position, means for normally holding said wheel in its inoperative position, a manually operated push-rod having a conical head at one end arranged for axial engagement with said wheel, to move the same to its operative position, and a power actuated shaft having a friction wheel thereon arranged to be operatively engaged by said axially movable wheel, as the latter is moved to its operative position.

7. In combination with the diaphragm of a signaling horn, a rotatable striker shaft therefor, a friction wheel mounted on said shaft, and arranged for axial movement between an operative and an inoperative position, means for normally holding said wheel in its inoperative position, a flexible rod having tubular guiding means, a handle at one end of said rod and a conical head at the opposite end thereof, guiding means for said head arranged for axial engagement with said wheel, when said rod is moved longitudinally to move the same to its operative position, and a power actuated shaft having a friction wheel thereon arranged to be operatively engaged by said axially movable wheel, as the latter is moved to its operative position.

8. In combination with the diaphragm of a signaling horn, a rotatable striker shaft therefor, a friction wheel mounted on said shaft, and arranged for axial movement between an operative and an inoperative position, means for normally holding said wheel in its inoperative position, a flexible rod having tubular guiding means, a handle at one end of said rod and a conical head at the opposite end thereof, means arranged to guide said head into axial engagement with said wheel, as said rod is moved longitudinally, and means to hold said head against rotation, and a power actuated shaft having a friction wheel thereon arranged to be operatively engaged by the wheel of said striker shaft, as the latter is moved to its operative position.

9. In combination with the diaphragm of a signaling horn, rotatably mounted striker-shaft axially movable into and out of operative relation with said diaphragm, means for normally holding said shaft in an inoperative position, a friction wheel on said shaft, a power driven shaft arranged parallel to said striker shaft and having means to prevent axial movement thereof, an axially adjustable friction wheel on said striker shaft, arranged to be engaged by the wheel of said striker shaft as the latter is moved to its operative position, and manually operated means for moving said striker shaft toward the diaphragm, to cause operative engagement of said wheels, and of said striker shaft with the diaphragm.

In testimony whereof, I have signed my name to this specification.

ANTHONY B. SILVIA.