R. H. HELSEL.

HORN.

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1,166,760. Patented Jan. 4, 1916.

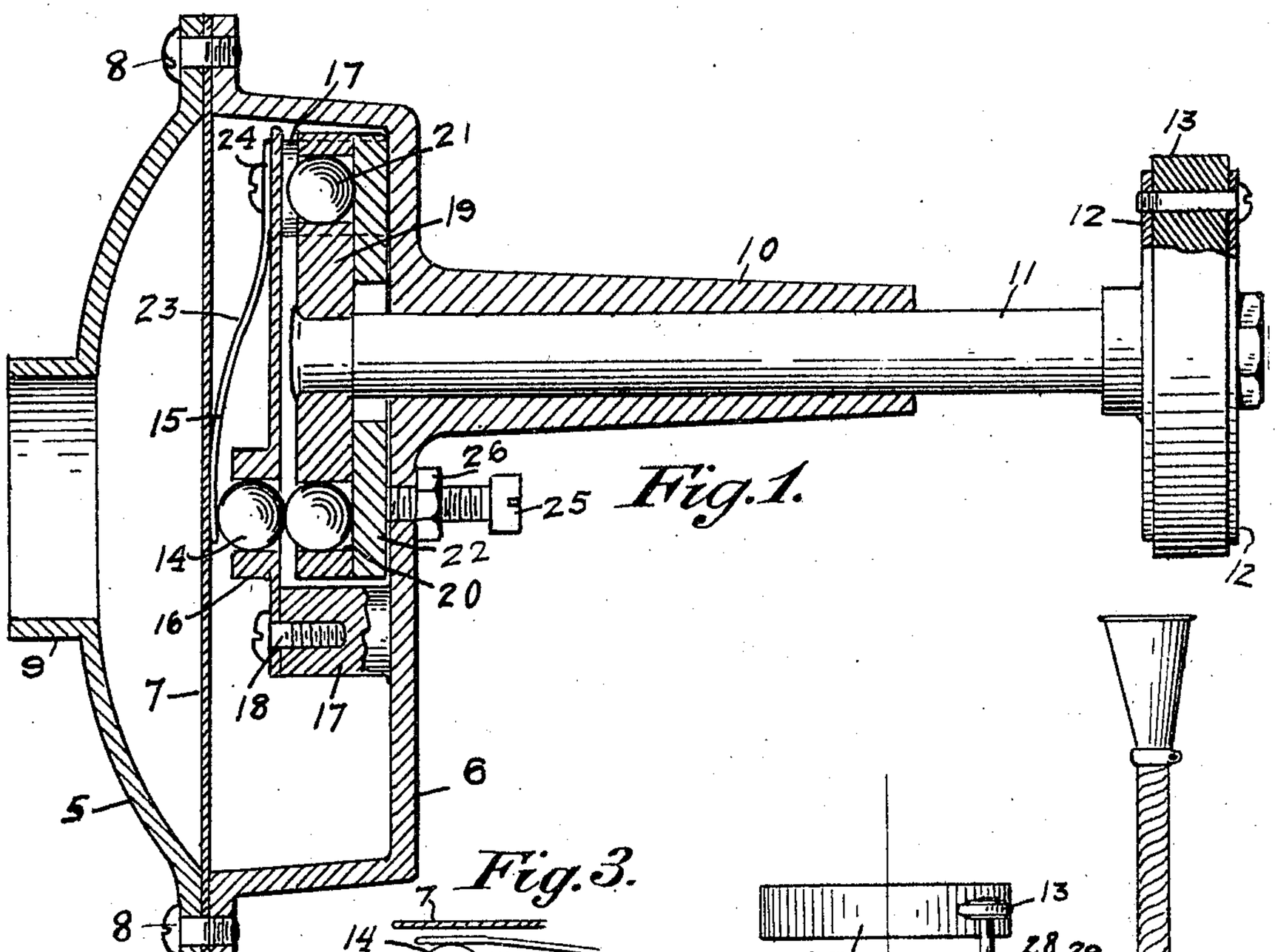


Fig. 1.

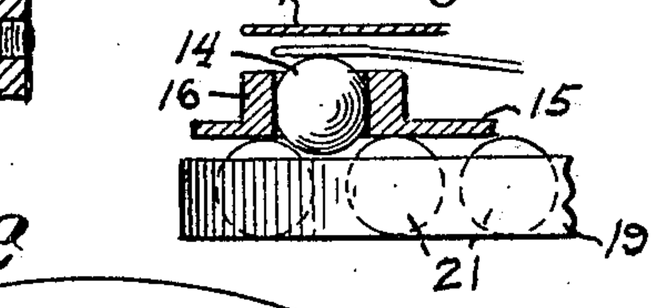


Fig. 3.

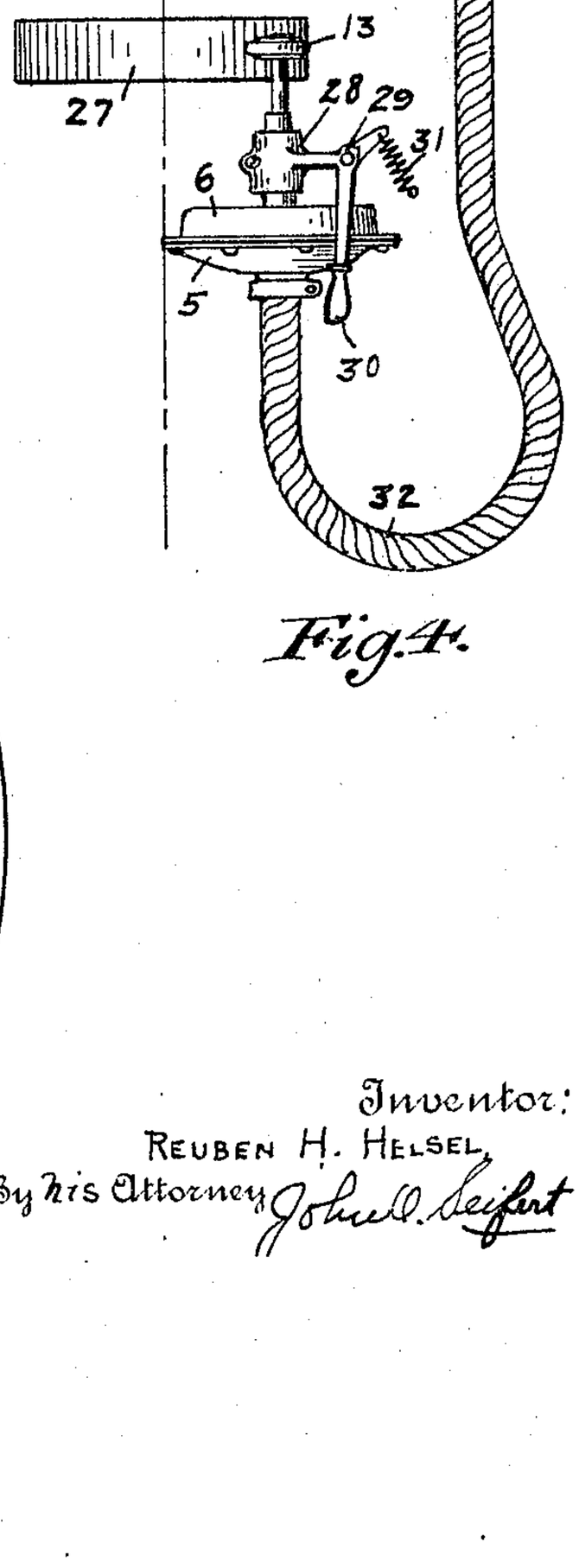
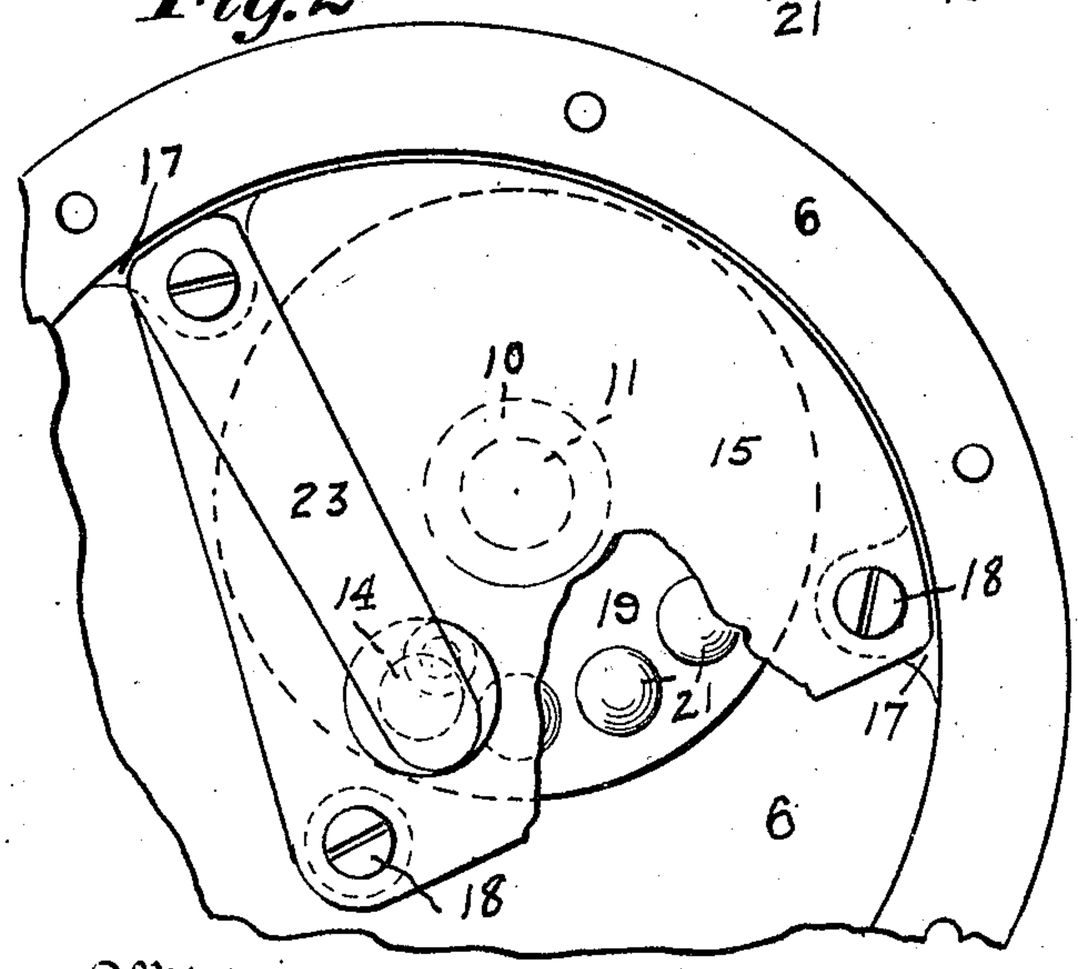


Fig. 4.

Fig. 2



Witnesses:
R. W. Ostrander
O. Philipp.

Inventor:
Reuben H. Helsel,
By his Attorney John A. Seifert

UNITED STATES PATENT OFFICE.

REUBEN H. HELSEL, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO JESSE MORGENTHAU, OF NEW YORK, N. Y.

HORN.

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To all whom it may concern:

Be it known that I, REUBEN H. HELSEL, a citizen of the United States, residing in the borough of Manhattan, in the city, county, and State of New York, have invented new and useful Improvements in Horns, of which the following is a specification.

This invention relates to horns and particularly to mechanically operated horns for use in connection with motor vehicles, such as automobiles, motor cycles and the like, and it is the object of the invention to provide a mechanically operated horn adapted to be operated from a moving or rotary part of the engine, motor or the like of a motor vehicle, and to provide a horn of this character that is cheap and simple in construction and efficient in operation.

In carrying out the invention I provide a suitably supported diaphragm and a rotatable member having means to engage with and be frictionally driven by a moving part of the engine or motor to actuate means to engage with and vibrate the diaphragm.

In the drawing accompanying and forming a part of this specification, Figure 1 is a longitudinal sectional view of a mechanically operated horn illustrating an embodiment of my invention. Fig. 2 is a fragmentary view looking at the top of the means to vibrate the diaphragm. Fig. 3 is a sectional side elevation of a portion of the means to vibrate the diaphragm; and Fig. 4 is a diagrammatic plan view to illustrate the manner of operating the horn from the flywheel of the engine of a motor vehicle.

Similar characters designate like parts throughout the different views of the drawing.

In the embodiment of my invention illustrated in the drawing the operative parts of the horn are inclosed in a casing consisting of a pair of separable sections 5, 6, each casing section having a laterally projecting annular flange. A suitable diaphragm 7 is clamped at its lateral edges between said flanges and the casing sections secured together by screws 8 having screw threaded connection with said flanges. The casing section 5 has a forwardly projecting hollow boss 9 for the application of an amplifier. However, if desired, this casing section 5 may itself constitute the amplifier. Projecting from the casing 6 eccentric to the axis of the casing is an elongated bearing sleeve 10, in which is rotatably supported a shaft 11. To the outer end of this shaft is fixed a friction wheel, in the present instance consisting of a pair of disks 12, 12 with a suitable friction material 13, such as fiber, rawhide or the like, clamped between said disks.

To vibrate the diaphragm I provide means to intermittently strike the diaphragm substantially centrally thereof. For this purpose I provide a hammer in the form of a ball 14 slidably supported in a carrier 15 in the form of a plate having a short sleeve 16 in which the ball is carried and secured to bosses 17 integral with the casing section 6, as by screws 18.

To cause the ball 14 to strike against the diaphragm I provide rotatable means connected to the shaft 11 to intermittently engage with the ball, comprising a disk 19 fixed to the end of the shaft 11 within the casing having a series of circularly disposed openings 20, each opening having a ball 21 seated therein, the diameter of the openings and of the balls being greater than the thickness of the disk 19 whereby a portion of the balls 21 will project beyond the face of the disk, a raceway 22 for the balls being interposed between said disk and the casing section 6, although it will be obvious that the casing itself may serve as such raceway. The diaphragm may be of any suitable material, but should it consist of fiber the repeated striking of the ball 14 against the same may cause the ball to wear through the material of the diaphragm, and to obviate this I interpose between said ball and diaphragm a resilient metallic finger 23 fixed as at 24, by one of the screws for the ball carrier 15. This finger normally stands away from the diaphragm and may also serve to return the ball 14.

To vary the force of the blow or impact of the ball against the diaphragm and thereby vary the tone of the horn; that is, increasing or decreasing the sound, I provide means to adjust the raceway 22 and thereby the extent to which the balls 21 project from the face of their carrier 19, comprising a set screw 25 screw threaded into the casing section 6, substantially centrally thereof and in line with the ball 14, a lock-nut 26 fastening the screw in adjusted position. It will be read-

ily understood that by adjusting the raceway to lie close to the ball carrier 19 that the throw of the ball 14 will be decreased thereby decreasing the force of the blow, and by adjusting the raceway in a reverse direction the travel of the ball 14 will be increased and thereby increasing the force of the blow of the ball.

As stated the horn is adapted to be mechanically actuated from a moving or rotating part of the engine or motor of a motor vehicle, and in Fig. 4 I have shown the friction wheel 13 adapted to be driven by the fly wheel 27 of the engine. The friction wheel is normally maintained out of engagement with the fly wheel and this may be accomplished by providing the shaft 11 with a universal joint and the provision of means to throw the friction wheel into and out of engagement with the fly wheel, the casing being supported in a fixed position. However, in the present instance I have shown the casing carried by a bracket 28 pivotally supported, as at 29, this bracket being in the form of a lever one arm of which has a hand grip 30 whereby to throw the wheel 13 into engagement with the fly wheel, a spring 31 normally maintaining it out of engagement with the fly wheel.

When operating the horn from the fly wheel the operative mechanism of the horn carried by the casing is located beneath the hood with the possibility that the tone of the horn will be smothered. To overcome this a tubular flexible conduit 32 is releasably connected at one end to the projecting boss 9 on the casing section 5, the other end having an amplifier connected thereto and located in a suitable position, as, for instance, in back of the radiator.

Variations may be resorted to within the scope of my invention.

Having thus described my invention I claim:

1. In a horn, a diaphragm supported at its edges; a ball slidably supported centrally of the diaphragm; a resilient finger interposed between the ball and diaphragm; a series of circularly arranged balls; and a rotatable carrier for said balls to cause them to successively engage with the first ball and intermittently force it against and vibrate the diaphragm.

2. In a horn, the combination with a diaphragm supported at its edges, of a ball slidably supported independently of and adjacent to the diaphragm; a disk having a series of circularly arranged openings; a ball of greater diameter than the thickness of the disk in each of said openings; a rotatable shaft to which the disk is fixed; an adjustable raceway for the balls below the ball carrying disk; and means to rotate the shaft and connected ball carrying disk to cause the balls to successively engage with and intermittently force the first ball against and vibrate the diaphragm.

3. In a horn, a diaphragm supported at its edges; a ball slidably supported centrally of the diaphragm; a disk having a series of circularly arranged openings; a ball of greater diameter than the thickness of the disk in each of said openings; a rotatable shaft to which the disk is fixed to rotate the disk and cause the balls to successively engage with the first ball and intermittently force it against and vibrate the diaphragm; a raceway for the balls interposed between the carrier for the balls and the casing below the ball carrying disk; and means to adjust the said raceway, substantially as and for the purpose specified.

4. In a horn, a casing consisting of a pair of axial separable sections, one section having an opening for the application of an amplifier; a diaphragm clamped at its edges between said casing sections; a ball to strike against and vibrate the diaphragm; a plate fixed within the other casing section to slidably carry said ball; a series of circularly disposed balls; a carrier for said balls of less thickness than the diameter of the balls; a rotatable shaft to which the said carrier is fixed; and an adjustable raceway for the circularly disposed balls interposed between the carrier for said balls and the casing, substantially as and for the purpose specified.

REUBEN H. HELSEL.

Witnesses:
JESSE MORGENTHAU,
W. H. KLECKNER.