E. RUBES.

WARNING SIGNAL.

APPLICATION FILED OCT. 3, 1916. RENEWED MAR. 22, 1920.

1,345,251. **Patented June 29, 1920.**

Fig. 1.

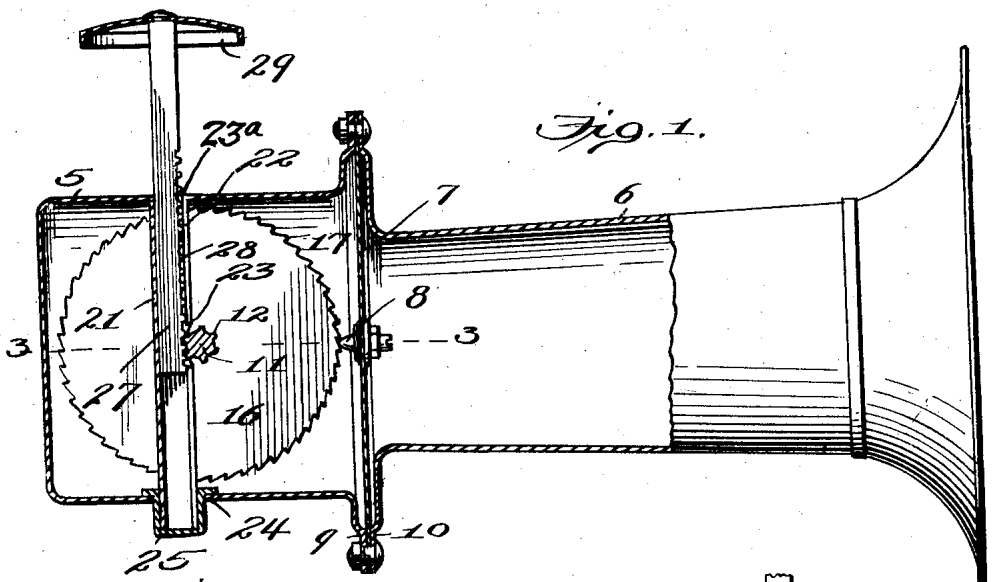


Fig. 2.

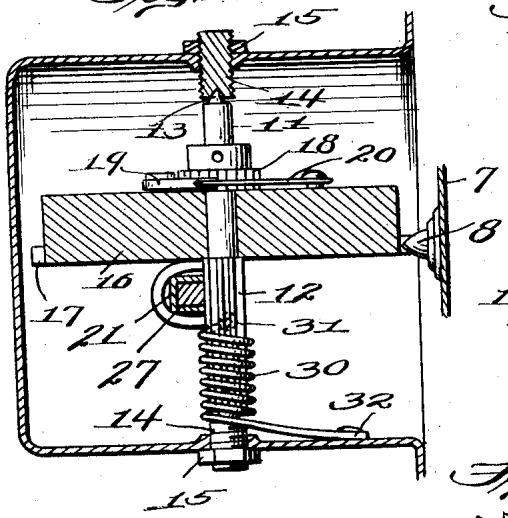


Fig. 3.

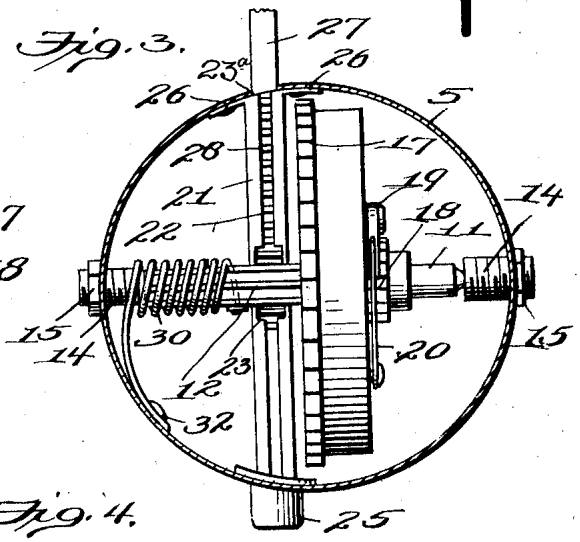
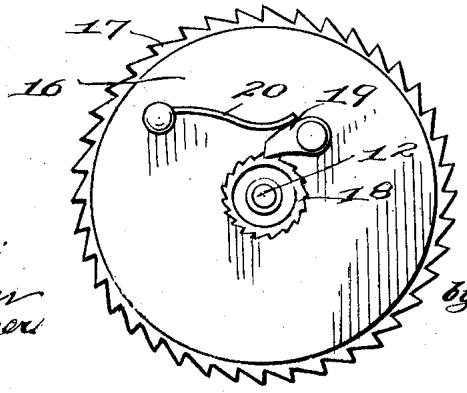


Fig. 4.



Witnesses:
C. D. Kesler
Chas. D. Hoyer

Inventor
Ernest Rubes
by James L. Norris,
Attorney

UNITED STATES PATENT OFFICE.

ERNEST RUBES, OF BROOKLYN, NEW YORK.

WARNING-SIGNAL.

1,345,251. Specification of Letters Patent. Patented June 29, 1920.

Application filed October 3, 1916, Serial No. 123,522. Renewed March 22, 1920. Serial No. 367,887.

To all whom it may concern:

Be it known that I, ERNEST RUBES, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Warning-Signals, of which the following is a specification.

This invention relates to warning signals for automobiles, motorcycles and other vehicles, and the primary object of the same is to provide a mechanical horn or signal in which alarm notes are generated by continuous displacement of the resonant diaphragm through the medium of directly applied manual power to set up a rapid rotation of a momentum wheel or actuator having devices to engage a portion of the diaphragm through the medium of mechanism of a particular construction.

The invention consists in the construction and arrangement of the several parts which will be more fully hereinafter described and claimed.

In the drawing:

Figure 1 is a partial longitudinal vertical section of a warning signal embodying the features of the invention.

Fig. 2 is an enlarged horizontal section of the working mechanism of the signal and part of the inclosing casing, together with a portion of the diaphragm.

Fig. 3 is an enlarged transverse vertical section taken in the plane of the line 3—3, Fig. 1.

Fig. 4 is a detail side elevation of the momentum wheel or actuator looking at the side thereof opposite that shown by Fig. 1.

The numeral 5 designates a mechanism inclosing casing which may be of any suitable dimensions, 6 a resonator or sound carrying horn secured to the casing, and 7 a resonant diaphragm having a projection 8. The diaphragm 7 is secured in fixed position between coacting flanges 9 and 10 respectively formed as a part of or secured to the casing 5 and resonator 6.

Within the casing 5 the working mechanism is mounted and comprises a shaft 11 having at one extremity an elongated pinion 12 rotatable therewith, the two extremities of this shaft being provided with bearing points or cones 13 engaging the inner ends of correspondingly recessed adjusting screws or threaded centers 14 which extend through opposite sides of the casing and are engaged by set nuts 15 to hold them in their adjusted positions. Loosely mounted on the shaft 11 is a revolving diaphragm actuator 16 which is in the form of a momentum disk or wheel and provided with a plurality of peripheral teeth 17 preferably at one side of the center thereof, this diaphragm actuator being arranged closely to the inner terminal of the pinion 12. A ratchet wheel 18 is secured to the shaft 11 close to the side of the actuator 16 opposite that which is adjacent to the pinion 12. The actuator 16 is confined for ready rotation on the shaft 11 between the pinion 12 and the ratchet wheel 18, and on the side of the actuator or momentum disk or wheel 16 is a pawl 19 having a spring 20 engaging the same and holding it in continual biting relation to the ratchet wheel 18, this pawl or dog 19 constituting a one-way clutch connection between the shaft 11 and the said actuator or momentum wheel 16. It will be understood that the pawl or dog 19 positively engages the teeth of the ratchet wheel 18 when the actuator or momentum wheel 16 is operated to vibrate the diaphragm 7 by depression of the manually controlled operating means which will be presently described, but said pawl or dog prevents reverse rotation of the said actuator or momentum wheel. The pawl or dog 19 connects the momentum wheel or actuator 16 to the shaft 11 through the medium of the said ratchet wheel and whereby a rotative impulse is given to the momentum wheel or actuator to cause the teeth 17 thereof to engage the projection 8 of the diaphragm 7.

Within the casing and extending across the latter, in a vertical direction as shown in the drawings, is a guide sleeve 21 having a slot 22 in its front side adjacent to the pinion 12, this slot being increased in lateral dimensions, as at 23, adjacent to the said pinion. The upper portion of the casing 5 has an opening 23^a formed therein and the lower casing has a similar opening 24 over which is secured a depending cap 25, the guide sleeve or tube 21 extending downwardly into this lower cap and terminating at its upper end coincidently with the upper opening 23. The upper end of the guide sleeve is secured to the casing by means of laterally projecting flanges 26, as clearly shown by Fig. 3. Reciprocatingly mounted in the guide sleeve 21 is a rack bar 27 which constitutes the primal operating means for the signal, the teeth 28 of this rack bar being

exposed through the slot 22 of the guide sleeve 21 and the lateral enlargement 23 of the said slot, said teeth always being held in mesh with the inner extremity of the pinion 12. The projection of the sleeve 21 into the lower cap 25 provides for a longer operation or a more extended actuation of the rack bar 27. The teeth 28 of the rack bar extend over only a portion of the said rack bar, and the upper part of this bar is freely reciprocable in the upper opening 23ª and normally projects above the top portion of the casing 5. The upper part of the rack bar which projects above the casing is smooth and preferably rectangular or square in cross-section, and on the upper end thereof is a pressure head or knob 29 for engagement by the hand of the operator in exerting a downward pressure on the rack bar 27 to actuate the shaft 11 through the pinion 12. A coiled spring 30 surrounds the outer portion of the pinion 12 and a part of the adjacent center bearing and has one terminal 31 secured to the casing 5, as shown by Figs 2 and 3, and the opposite terminal 32 fastened to the intermediate portion of the said pinion. The coils of this spring contract and relax relatively to the pinion and adajcent bearing center 14 according to the direction of movement of the rack bar 27.

The teeth 17 of the actuator or momentum wheel 16 are always held in engagement with the projection 8 of the diaphragm 7, and a downward pressure on the rack bar 27 sets up a rotation of the shaft 11 through the medium of the pinion 12 and the said actuator 16 is rotated by the engagement of the pawl or dog 19 with the ratchet wheel 18. A rapid reciprocation of the rack bar 27 will result in a correspondingly rapid rotation of the actuator 16, the latter acquiring sufficient momentum to cause it to run some time after positive actuation thereof through the operation of the devices just explained and thereby produce a rather prolonged warning signal or sound. When the rack bar 27 is relieved of downward pressure it is returned to normal position by the spring 30 and this spring also rotates the shaft 11 and pinion 12 in a direction reverse to that imparted thereto by the depression of the said rack bar, and as the rack bar is always in mesh with the pinion it will be accurately elevated or returned to normal position by the said spring, which is coiled and tightened by the downward movement of the rack bar, the spring coils contracting around the portions of the pinion and center bearing engaged thereby. This upward movement of the rack bar to its normal position does not interfere with the operation of the actuator 16, or the latter is not retarded in its rotation in view of the fact that the pawl or dog 19 is free to slip over the teeth of the ratchet wheel when the shaft and pinion are reversed in their operation by the spring 30 when pressure is relieved from the rack bar.

The shaft 11 may be adjusted at any time found necessary through the medium of the screw centers explained, and by the use of the sleeve 21 the rack bar 27 is always held in positive and reliable operating relation to the pinion 12 and will not pull away from or have only a partial engagement relatively to the said pinion. The improved signal may be instantly operated to produce a warning sound by the slightest depression of the rack bar 27, with material advantages in this type of warning signals. The several parts of the improved warning signal are comparatively simple in construction and may be readily associated to produce a strong and durable signal device.

What is claimed is:

1. A warning signal of the class specified comprising a casing, a resonant diaphragm held in the casing, a shaft extending across the interior of the casing in rear of the diaphragm and embodying an elongated pinion as a part of the structure thereof, said pinion extending from about the center of the shaft outwardly to one end, a toothed diaphragm actuator mounted to loosely rotate on the shaft, a reciprocatory rack bar solid from end to end and mounted in a guide sleeve, the rack bar being held in continual engagement with the pinion for rotating the latter in a direction to impart a rotation to the actuator to vibrate the diaphragm, the pinion by a reverse movement being the sole means in direct engagement with the rack bar for restoring the latter to normal position, a ratchet wheel fixed to the shaft at a distance from the inner end of the pinion, a pawl secured to the actuator and continually held in engagement with the ratchet wheel, and a spring loosely coiled around the outer extremity of the pinion and having one end secured to the pinion and the opposite end to an adjacent portion of the casing at a distance from the pinion to impart a reverse rotation to the pinion and shaft subsequent to actuation of the shaft for vibrating the diaphragm, the spring coiling upon the pinion when the rack bar is depressed.

2. In a warning signal, the combination of a casing having a diaphragm mounted therein, a shaft rotatably disposed in the casing and having integral operating means, a weighted diaphragm actuator mounted to loosely rotate on the shaft, means provided between the actuator and the shaft for connecting said actuator at intervals to the shaft, a reciprocating rack bar engaging the said shaft operating means, and a spring loosely coiled around a part of the shaft and having one end secured to the latter and the opposite end to an adjacent portion of the

casing to impart a reverse rotation to the shaft subsequent to actuation of the shaft for vibrating the diaphragm, the spring being coiled upon the part of the shaft engaged thereby when the rack bar is depressed.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ERNEST RUBES.

Witnesses:
CHAS. S. REILLY,
W. H. MASON.