Aug. 21, 1951 K. E. LYMAN 2,564,984

WARNING SIGNAL FOR VEHICLES

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Fig. 1

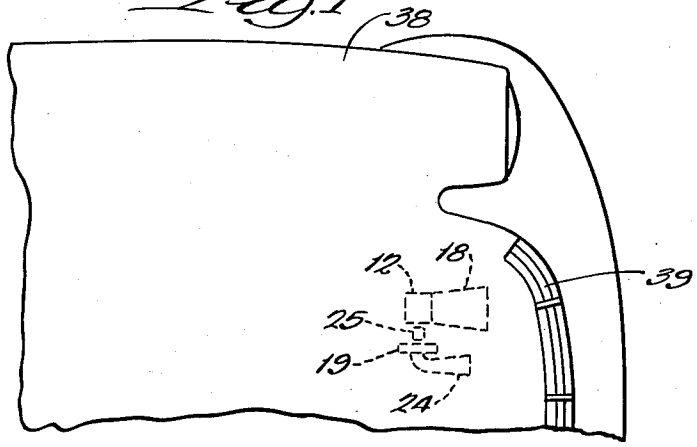
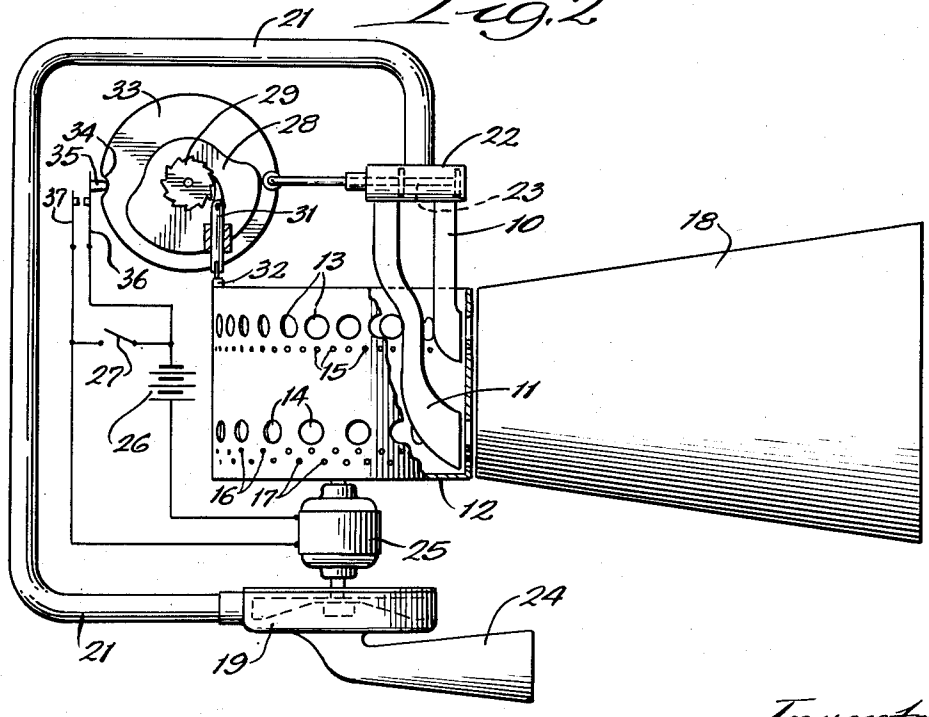


Fig. 2



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WARNING SIGNAL FOR VEHICLES

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9 Claims. (Cl. 177—7)

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This invention relates to warning signals for vehicles and more particularly to audible air operated signals for automobiles.

It is one of the objects of the invention to provide an air operated warning signal which can be given any desired tonal quality and pitch.

Another object is to provide a warning signal which can produce a plurality of successive signals of different tonal quality and/or pitch. According to one feature of the invention the construction is so arranged that each signal cycle starts with the same tone and follows the same succession of tones.

A further object is to provide a warning signal operated by air in which the volume of the signal is varied in response to the vehicle velocity without substantially altering the quality or pitch of the signal. In the preferred construction air to operate the signal is supplied by a blower, and an air scoop is connected to the blower inlet to vary the inlet pressure and consequently the pressure supplied to the signal device in response to vehicle velocity.

The above and other objects and advantages of the invention will be more readily apparent when read in connection with the accompanying drawing, in which—

Figure 1 is a partial plan view of an automobile illustrating the location of the signal device thereon; and

Figure 2 is a diagrammatic view with parts in section of the signal device embodying the invention.

As shown in Figure 2, the signal is generated by periodically interrupting a stream of air to produce pulsations therein at an audible frequency.

As shown, air is supplied to a pair of nozzles 10 and 11 which extend into a hollow cylindrical member 12 formed in its periphery with sets of openings 13 and 14 which register respectively with the nozzles. As shown, the openings 13 and 14 may be spaced different distances to produce tone signals of different fundamental pitch as will be understood.

According to one feature of the invention, the quality of tone produced can be controlled to provide the desired harmonics or overtones to give a pleasing sound. For this purpose supplemental series of openings 15 may be formed adjacent the series of openings 13 and may be of smaller size and different spacing than the openings 13. Supplemental series of openings 16 and 17 are formed adjacent the openings 14 and are of different size and spacing than the openings 14

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to produce harmonics or overtones. By properly selecting the size and spacing of the supplemental openings substantially any desired tone quality can be produced. A horn 18 is preferably mounted adjacent the cylindrical member 12 in register with the nozzles to direct the signal, as desired.

Air is supplied to the nozzles by a blower 19 having an outlet conduit 21 connected centrally to a transfer valve 22. The nozzles 10 and 11 are connected respectively to the opposite ends of the transfer valve, and the valve contains a shiftable spool 23 which can be shifted to connect the conduit 21 alternately to the nozzles 10 and 11. In this way the nozzles are made successively effective to produce two different tones in sequence.

According to one feature of the invention, the strength of the signal is varied automatically in response to the vehicle speed so that the signal will be louder at high speeds. For this purpose an air scoop 24 is connected to the inlet of the blower 19 and is arranged to face in the direction of vehicle travel. When the vehicle is traveling at low speed the scoop will develop a relatively low inlet pressure so that outlet pressure of the blower will be relatively low and the signal will be weak. At higher speeds, however, the scoop 24 develops a relatively high inlet pressure for the blower so that its outlet pressure is correspondingly higher to increase the signal strength. In this way the signal strength is automatically controlled with a minimum number of parts.

The blower and the cylindrical member 12 are both driven by an electric motor 25 which is connected to a battery 26 through a manual switch 27. The manual switch may be the usual horn button or horn ring on the steering wheel of the vehicle, and when it is closed to energize the motor, the blower will be driven and the member 12 will rotate to produce a signal.

Rotation of the member 12 is utilized to operate the valve spool 23 so that the two tones of the signal will be produced in sequence. For this purpose a cam 28 is provided which carries a ratchet wheel 29. A sliding pawl 31 engages the ratchet wheel to turn it and the cam as the member 12 turns. The pawl is operated once for each revolution of the member 12 by means of a cam projection 32 at one edge of the member 12 which engages the pawl and moves it upward each time the member 12 rotates. By selecting a ratchet 29 having the desired number of teeth the cam can be given one complete rotation for

any desired number of rotations of the member 12.

To insure that each signal cycle will start with the same tone, the cam carries a disc 33 having a single notch 34 in its periphery. A follower 35 or a switch contact 36 engages the periphery of the disc 33 and is adapted to drop into the notch 34 when the disc is in the position shown. The contact 36 when moved to the left by the disc engages a second contact 37 to complete a holding circuit in parallel with the manual switch 27. In operation the parts normally occupy the position shown in which the holding circuit is open and the valve spindle 23 is shifted to the right. When the switch 27 is closed to start a signal cycle, the motor will drive the blower and the member 12 to force air through the nozzle 10. The air stream will be periodically interrupted by the openings 13 and 15 to produce a signal of the desired pitch and tone quality. As the member 12 turns, it will turn the cam and the disc 33 through the ratchet 31 in a counterclockwise direction. After the cam has turned approximately 180° the lower part thereof will be presented to the valve spool 23 so that it can shift to the left to connect the conduit 21 to the nozzle 11. At this time the nozzle 11 will be effective to produce its signal and the nozzle 10 will be ineffective. After the cam has turned through one complete revolution, the follower 35 will drop into the notch 34 to interrupt the holding circuit so that if the manual switch 27 has been opened the parts will stop in the position shown ready for another cycle.

The signal is mounted on a vehicle as illustrated in Figure 1 in which a car body is partially shown at 38. In its forward end the body is formed with a grill 39 through which air can flow freely during normal forward travel. The signal device and the air scoop are preferably mounted closely adjacent to the grill so that air flow therethrough will be picked up by the air scoop but the horn 16 may be shielded so that it will not be exposed to air flow. In this way the strength of the signal will be varied automatically in response to the velocity of the vehicle, as explained above.

While one embodiment of the invention has been shown and described in detail herein, it will be understood that this is illustrative only and is not to be taken as a definition of the scope of the invention, reference being had for this purpose to the appended claims.

What is claimed is:

1. A warning signal for vehicles comprising a continuously movable member movable in a predetermined path having a series of openings therein, an air nozzle toward the path of movement adjacent the member in register with the series of openings and directed toward the member, a motor to move the member, and an air pump driven by the motor and connected to the nozzle to supply air thereto.

2. A warning signal movable in a predetermined path for vehicles comprising a continuously movable member having a plurality of series of spaced openings therein, the openings in each series lying in a line parallel to said path, a nozzle adjacent to the line of each series of openings and directed toward the openings, a valve shiftable from one position to another and connected to the nozzles to connect the nozzles selectively to a source of pressure, and means responsive to movement of the member to move the valve.

3. A warning signal for vehicles comprising a continuously movable member having a plurality of series of spaced openings therein, a nozzle adjacent each series of openings, a valve movable to connect the nozzles selectively to a source of pressure, a cam to move the valve, means operated by movement of the member to move the cam, a motor to move the member, a manual switch to initiate operation of the motor, and a holding switch operated by movement of the cam to maintain the motor in operation until the cam reaches a predetermined position.

4. A warning signal for vehicles comprising a rotatable member formed with a plurality of series of spaced openings, a motor to rotate the member, a nozzle adjacent each series of openings, a valve movable to connect the nozzles selectively to a source of pressure, a rotatable cam, a follower engaging the cam and connected to the valve to move the valve, a ratchet connected to the cam, and a pawl actuated by rotation of the member and engaging the ratchet to turn the cam and ratchet.

5. A warning signal for vehicles comprising a rotatable member formed with a plurality of series of spaced openings, a nozzle adjacent each series of openings, a valve movable to connect the nozzles selectively to a source of pressure, a rotatable cam to move the valve, a ratchet on the cam, a pawl actuated by rotation of the member to turn the cam and ratchet, a motor to rotate the member, a manually operable switch to initiate operation of the motor, and a holding switch operated by movement of the cam to maintain the motor in operation until the cam reaches a predetermined position.

6. A warning signal for vehicles comprising a rotatable member formed with a plurality of series of spaced openings, a nozzle adjacent each series of openings, a valve movable to connect the nozzles selectively to a source of pressure, a rotatable cam to move the valve, a ratchet on the cam, a pawl actuated by rotation of the member to turn the cam and ratchet, a blower connected to rotate with the member and forming a source of pressure for the nozzles, and means responsive to the velocity of the vehicle to vary the pressure supplied by the blower to the nozzles.

7. A warning signal for vehicles comprising a rotatable member formed with a plurality of series of spaced openings, a nozzle adjacent each series of openings, a valve movable to connect the nozzles selectively to a source of pressure, a rotatable cam to move the valve, a ratchet on the cam, a pawl actuated by rotation of the member to turn the cam and ratchet, a blower connected to rotate with the member and forming a source of pressure for the nozzles, a motor to rotate the member and the blower, and an air scoop connected to the blower inlet to vary the blower pressure in response to velocity of the vehicle.

8. A warning signal for vehicles comprising a rotatable member formed with a plurality of series of spaced openings, a nozzle adjacent each series of openings, a valve movable to connect the nozzles selectively to a source of pressure, a rotatable cam to move the valve, a ratchet on the cam, a pawl actuated by rotation of the member to turn the cam and ratchet, a motor to rotate the member, a manually operable switch to initiate operation of the motor, a holding switch operated by movement of the cam to maintain the motor in operation until the cam

reaches a predetermined position, a blower driven by the motor and forming a source of pressure for the nozzles, and means responsive to the velocity of the vehicle to vary the pressure supplied by the blower to the nozzles.

9. A warning signal for vehicles comprising a movable relatively thin-walled member formed with a series of relatively large spaced openings to produce a fundamental tone and with an adjacent series of smaller differently spaced openings to produce harmonics of the fundamental tone, means to move the member, a nozzle adjacent to the member registering with both series

of openings to cause a flow of air through the openings and means to supply air under pressure to the nozzle.

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The following references are of record in the file of this patent:

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Certificate of Correction

Patent No. 2,564,984 August 21, 1951

KENNETH E. LYMAN

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 3, lines 64 and 65, strike out "movable in a predetermined path" and insert the same in line 66, same column, after "member";

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of February, A. D. 1952.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.