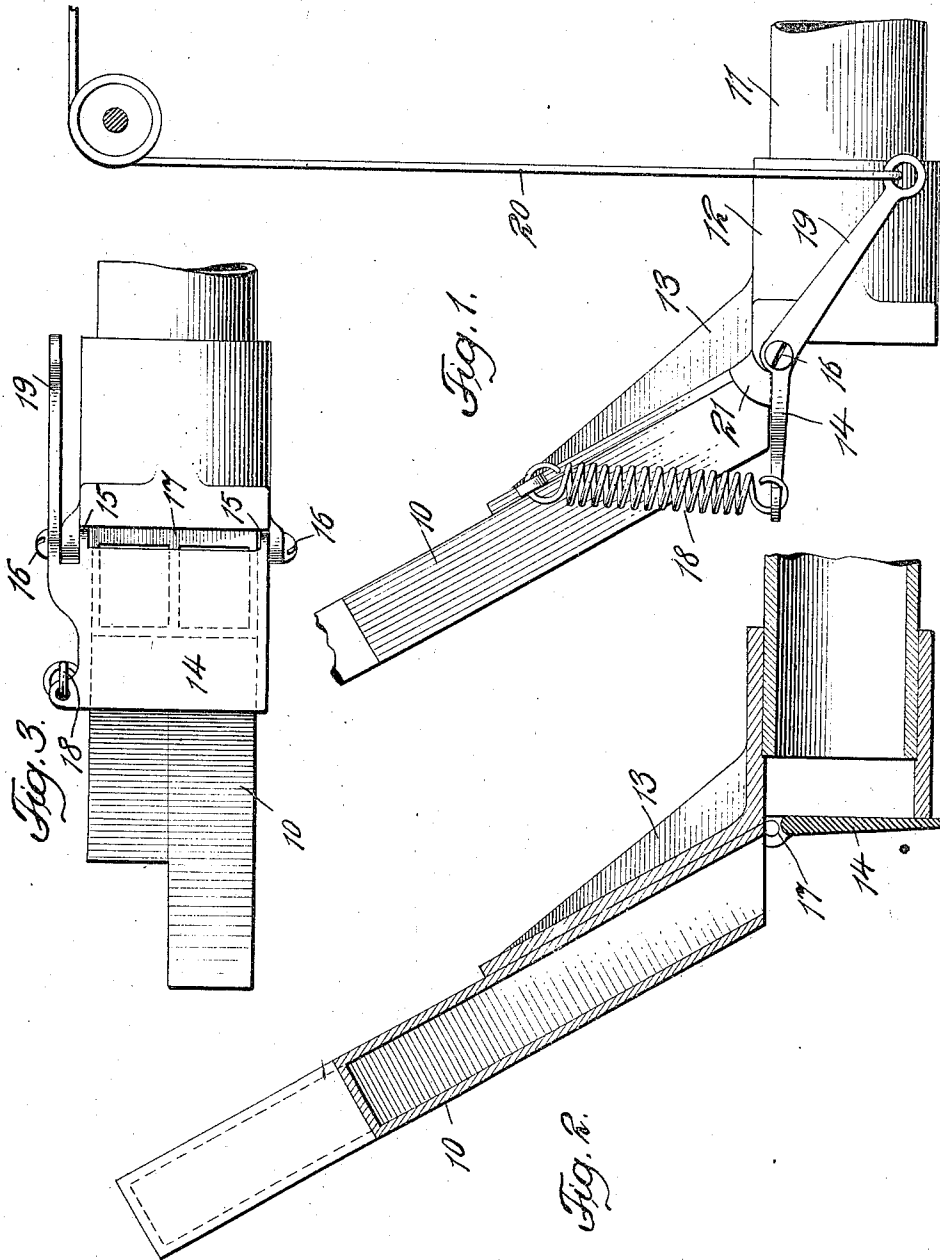


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SIGNAL.

APPLICATION FILED FEB. 6, 1911.

997,833.

Patented July 11, 1911.



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SIGNAL.

997,833.

Specification of Letters Patent. Patented July 11, 1911.

Application filed February 6, 1911. Serial No. 606,855.

To all whom it may concern:

Be it known that I, WILLIAM BRUCE KNAPP, a citizen of the United States, and a resident of Stoneham, county of Middlesex, State of Massachusetts, have invented a new and Improved Signal, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in signals, and more particularly to that type of signal commonly known as a motor vehicle horn, and adapted to be operated by exhaust gas from the engine on the motor vehicle. In this type of signal, there is employed an air chamber or sound box disposed adjacent to a delivery conduit for the exhaust gas of the engine, and a movable member is so positioned that it may cause the gas to be delivered to operate the signal, or may be permitted to escape without operating the signal.

The principal object of my invention is to so construct and arrange the parts as to leave a free and straightaway passage for the gas when the horn is not in operation; to maintain the same angle of delivery of the gas irrespective of the position of the controlling member; to afford a protection for the sound chamber when the horn is not in operation; to control the volume of sound irrespective of the volume of the exhaust gas delivered, and to bring the center of gravity of the horn as near as possible to the exhaust pipe.

My improved construction may be easily attached to the exhaust pipe irrespective of the proximity of the latter to the rear axle of the car, it is inexpensive to manufacture, and cannot get out of order. Furthermore, it is possible to readily adapt the horn to a car of larger horsepower than the one for which it was originally intended by filing the gas outlets a little larger, without varying the direction of delivery of the gas.

Reference is to be had to the accompanying drawings forming a part of this specification and in which the same reference characters indicate corresponding parts in the several views.

Figure 1 is a side elevation of my improved signal, the movable member being in normal position; Fig. 2 is a vertical longitudinal section therethrough, the movable

member being in position to operate the signal; and Fig. 3 is an inverted plan view of the parts shown in Fig. 1.

My signal may assume various different forms, and is adapted for use in other connections than the exhaust gas of the engine of a motor vehicle. The specific form shown in the drawing is, therefore, to be considered in an illustrative rather than a limiting sense.

In the specific form shown, I provide a sound box or air chamber 10 of tubular form closed at the upper end and open at the lower end, and supported in any suitable manner in proper relationship to the end of a tail pipe 11. As shown, a collar 12 is secured to the tail pipe so as to form a portion of the exhaust conduit, and this collar carries a bracket 13 to which the sound box is riveted, soldered or otherwise rigidly secured. The exhaust conduit and the sound box are preferably arranged at an angle to each other, with the open end of the sound box adjacent to the gas outlet. Intermediate between the two, I pivotally support a movable member 14, constituting a valve plate. This member is of such form and is so mounted that normally it protects the open end of the air chamber or sound box so as to prevent mud or other foreign material from being thrown up into the sound box, and to prevent any other material from accumulating therein. The movable member is also so mounted that it may be moved away from the opening in the sound box, and to such a position that it will close or partially close the end of the exhaust conduit, leaving only a comparatively small slot or opening through which the exhaust gas may escape under high pressure and blow across the opening to the sound boxes and produce the desired sound. As shown, the valve plate or movable member 14 has ears or lugs 15, 15 for receiving suitable pivots 16, which connect the movable member to a support which in the form illustrated is the collar 12. The member 14 is so mounted in respect to the collar, that when the member is swung to a position adjacent to, or in engagement with, the end of the collar, a narrow slot 17 will be left between the hinge edge of the member and an edge of the conduit, through which the exhaust gas may blow under high pressure.

This escape of the exhaust gas across the opening to the sound box produces the sound.

Any suitable means may be provided for controlling or moving the member 14. As shown, a coil spring 18 connects the free edge of the member with a lug on the bracket 13 and normally tends to hold the member in its horizontal position, closing the inlet of the sound box. The member has an arm or extension 19 to which a cord or wire 20 may be secured. The cord extends in such direction that upon pulling on it, the member may be swung from one position to the other against the tension of the spring. As soon as the cord is released, the spring immediately pulls the member back to a position to stop the production of sound.

To prevent injury to the thin walls of the sound box by the violent contact of the member 14 therewith, the bracket 13 may be provided with lugs or extensions 21 upon opposite sides of the sound box, and presenting lower edges substantially flush with the lower edges of the sound boxes to receive the impact of the member 14.

The specific form illustrated has the air chamber or box 10 subdivided into a plurality of parallel chambers of different lengths, although of course the sound box may have only a single chamber if desired.

It will be noted that with the movable member 14 in its normal position, there is nothing whatever to interfere with the free escape of the exhaust gas. As soon as the member 14 is swung downwardly, the slot 17 is formed at the hinged edge of the member; and this slot does not increase in width to any very great extent during the last portion of the downward swinging movement of the member. If the engine be running at slow speed, then the member 14 may be brought into direct engagement with the collar, so that all of the gas will be compelled to flow through the slot and the horn will be operated. If the engine be running at very high speed, the member 14 need be pulled down only to such a distance that a portion of the gas will escape through the slot and a portion below the lower edge of the member and the first mentioned portion will be sufficient to blow the horn. The volume of sound may thus be varied at will, and substantially the same sound may be produced with the engine at high speed as can be produced when it is running at low speed.

Should it be desired to adapt the horn to an engine of higher horsepower than the one for which it was originally intended, it is merely necessary to remove the member 14, file down the hinged edge of the member and replace said member. This will increase the width of the slot and permit a

greater quantity of gas to escape there-through, but it will not change the direction of flow of the gas and will not vary the relative position of the slot in respect to the open end of the sound box. By having the sound box extend upward substantially vertical from the collar, the center of gravity is brought very close to the collar and thus very close to the end of the exhaust pipe. This not only reduces the strain on the exhaust pipe, but also permits the horn to be secured to said pipe even though the latter terminates closely adjacent to the rear axle of the car.

Having thus described my invention what I claim as new and desire by Letters Patent, is:

1. A signal comprising an air chamber having an opening, across which gas may pass to operate the signal, a gas conduit terminating adjacent to said opening, a hinged valve plate outside of said chamber and said conduit, and normally protecting said opening and permitting the free escape of gas from said conduit, and means for moving said hinged valve plate away from said opening to a position partially closing the outlet from said gas conduit and causing the gas to escape through a restricted opening across the opening in said air chamber.

2. A signal comprising an air chamber having an opening, across which gas may pass to operate the signal, a gas delivery conduit having an open end adjacent to said opening and delivering across the latter, and a member hinged intermediate between said opening and said open end, and movable to substantially close either of them.

3. A signal comprising a sound box having an opening, across which gas may pass to operate the signal, a gas delivery conduit having an open end adjacent to said opening, and a valve plate outside of said sound box and said conduit and hinged intermediate between said opening and said end and movable toward said open end to partially close the latter.

4. A signal comprising a conduit, a chamber at one side thereof, and having a single opening, across which gas may pass during the operation of the signal, and a valve plate hinged adjacent to one side of said conduit and adjacent to said opening, and normally covering said opening and movable to a position to partially close said conduit and permit the escape of gas from the latter past said opening.

5. A signal comprising a chamber having an opening, a gas delivery conduit having the open end adjacent to said opening and presenting a substantially straight edge on the side adjacent to said opening, and a valve plate outside of said conduit and hinged adjacent to said straight edge and movable toward said open end into engagement with

the latter, said valve plate having a straight edge spaced from said first-mentioned straight edge to leave a narrow slot through which the gas can escape across said opening when said member is in the last-mentioned position.

6. A signal comprising a chamber having an opening, a gas delivery conduit, a bracket for rigidly supporting said chamber from said conduit, a member movable to control the escape of gas from said conduit and normally covering said opening, and flanges carried by said bracket for reinforcing the wall of the chamber at said opening and forming stops for said member when the latter is in normal position.

7. A signal comprising a gas delivery conduit, a chamber rigid therewith at one side thereof and out of alinement with said conduit, and having an opening across which gas may pass during the operation of the signal, and a movable member hinged between the opposite sides of said conduit, and having one edge thereof spaced from an adjacent side of the conduit to leave a slot through which the gas may escape past said opening when the member is swung to substantially close the conduit.

8. A signal comprising a gas delivery conduit, a tube disposed at an angle thereto, and having an open end adjacent to the end of the conduit and a movable member hinged between said conduit and said tube, with the hinged edge adjacent to the tube and movable to control the escape of gas from said conduit, said member having the hinged edge thereof spaced from a portion of the conduit to leave an opening for the escape of the gas past the end of the tube.

9. A signal comprising a substantially straight, gas-delivery conduit, a sound box

rigid therewith and out of alinement therewith, and having an opening across which gas may pass from said conduit to produce a sound, and a member normally protecting said opening to prevent the admission of foreign substances to said sound box through said opening and movable to uncover said opening and to partially close the conduit while leaving a gas outlet from said conduit juxtaposed to the inlet to the sound box and through which outlet the gas may pass to produce sound.

10. A signal comprising a gas-delivery conduit, having a normally open end, a sound box rigid therewith and out of alinement therewith, and having an opening substantially in a plane at right angles to the plane of said open end and beyond the latter, and past which the gas may flow from said conduit, and a member movable to partially close said open end and leave a narrow slot adjacent to one edge of said opening for the escape of gas under high pressure from said conduit across said opening to operate the signal.

11. A horn comprising an exhaust receiving pipe having an open end, a resonant chamber having a coacting edge located close above and beyond said open end, and a door for the latter adapted when closed to leave a slit for directing the exhaust into coaction with said edge, and when open to shield said edge.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM BRUCE KNAPP.

Witnesses:

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W. C. CAMPBELL.