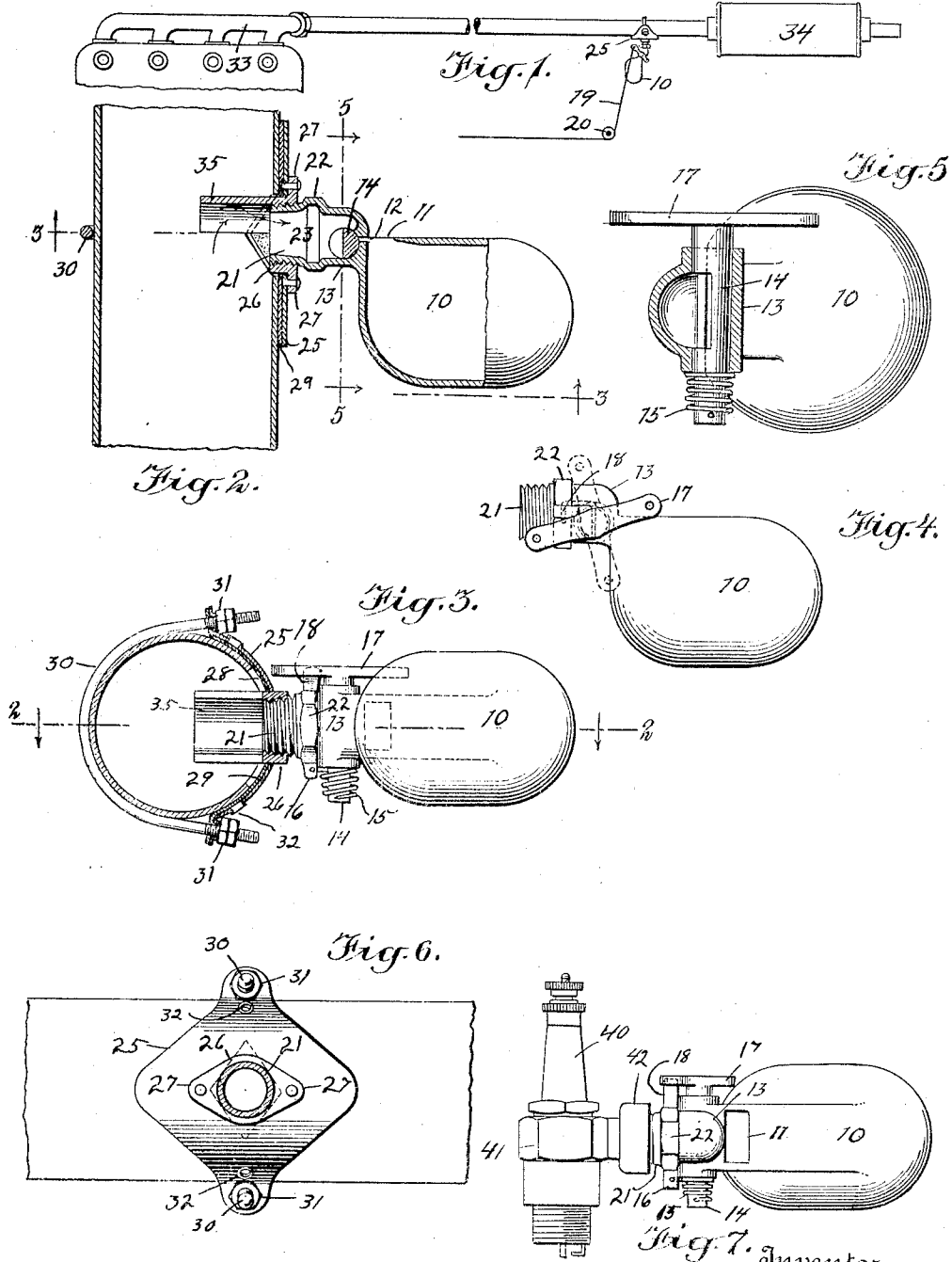


J. H. KAESER.
 AUTOMOBILE WARNING SIGNAL.
 APPLICATION FILED JAN. 16, 1919.

1,329,772.

Patented Feb. 3, 1920.



Inventor
 Julius H. Kaeser
 By *C. W. Fairbank*
 Attorney

UNITED STATES PATENT OFFICE.

JULIUS H. KAESEN, OF NEW YORK, N. Y.

AUTOMOBILE WARNING-SIGNAL.

1,329,772.

Specification of Letters Patent.

Patented Feb. 3, 1920.

Application filed January 16, 1919. Serial No. 271,369.

To all whom it may concern:

Be it known that I, JULIUS H. KAESEN, a citizen of the United States, and a resident of New York city, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Automobile Warning-Signals, of which the following is a specification.

10 This invention is a warning signal adapted for use in connection with an internal combustion engine and operated by the escape of gas under pressure in a stream or jet in the proper relationship to a sound chamber.
15 More particularly, my invention involves a sound chamber of predetermined, definite, and constant size with the fixed gas outlet also of predetermined size and position in respect thereto, the flow of gas to said outlet
20 being controlled by a rotary valve separate from but adjacent thereto. Whistles or other wind instruments serving as warning signals have heretofore been designed and employed on the end of the exhaust pipe
25 beyond the muffler and other forms have been connected to said exhaust pipe ahead of the muffler, but in all prior constructions with which I am familiar having the fixed volume sound chamber with the predetermined fixed jet outlet, the design has been
30 such that it was necessary to close or obstruct the free normal escape of the exhaust gas in order to create the desired high pressure necessary for the operation of the signal. This partial obstruction of the escape
35 of the exhaust has increased the back pressure on the engine and has accordingly interfered with its normal operation and cut down its efficiency.

40 My improved construction is such that it may be connected to the exhaust pipe or exhaust manifold in front of the muffler, and when not in operation does not in any way interfere with the normal escape of gas
45 through the muffler. When operated, it acts to a limited extent as a muffler cutout, so as to reduce the back pressure on the engine and increase rather than decrease its efficiency. At the same time while sounding,
50 it will automatically indicate to the driver, by its regularity or irregularity of sound whether or not any of the cylinders of the engine are missing fire or failing to operate properly to give full power and full discharge of exhaust gas.

One object of my invention is to simplify

the construction and reduce the cost of manufacture of the signal, facilitate the easy and inexpensive attachment of the signal, and render the signal free from all liability
60 of getting out of order, adjustment, or position. The signal is so designed that it may be attached to the exhaust conduit ahead of the muffler by merely cutting a hole in the pipe, which hole need not be of any exact
65 size, shape, or dimension, and the connecting means is such that it works equally well with pipes of various shapes or sizes. At the same time the construction is such that the signal may be mounted on and connected to
70 one of the engine cylinders so that when in operation it will receive gas directly from the cylinder during the compression and explosion strokes of the piston.

In the accompanying drawings to which
75 reference is to be had, I have illustrated one embodiment of my invention, although it will of course be evident that changes may be made without departing from the spirit or scope of my invention as defined in the
80 appended claims.

In these drawings:

Figure 1 is a diagrammatic view of a portion of an engine cylinder with its exhaust pipe and muffler, and showing my improved
85 device attached thereto.

Fig. 2 is a central longitudinal section through such a pipe and with my device attached thereto, said section being taken
90 substantially on the line 2—2 of Fig. 3.

Fig. 3 is an inverted plan view of the device with the connecting member and conduit in section, the view being taken
95 substantially on the line 3—3 of Fig. 2.

Fig. 4 is a side elevation of the device
100 detached.

Fig. 5 is a transverse section on the line 5—5 of Fig. 2.

Fig. 6 is a transverse section through the threaded nipple showing a plan of the con-
105 nections to the conduit, and

Fig. 7 is a view somewhat similar to Fig. 3, but showing the device attached to a spark plug for use directly on the engine.

In the preferred form of my signal, a
110 single casting forms the entire device *per se*. As shown, this casting forms a sound chamber 10 of the proper shape, size, and volume, and with an opening 11 to the atmosphere, and an aperture 12 through which the jet
115 of gas may escape in a direction approximately parallel to the plane of the opening

11 or in such relationship thereto that the escape of gas through the aperture 12 under pressure will cause the device to operate as a whistle. This aperture 12 is shown as a comparatively narrow slot or slit, although it will of course be evident that the aperture may be of other shape, or may be sub-divided into a plurality of separate sections.

The same casting that forms the sound chamber 10 with the apertures 11 and 12 therein also forms a valve casing 13 for a rotary valve 14. This rotary valve has its axis closely adjacent to and substantially parallel with the general direction of the length of the slot 12 and is so positioned that by its rotation through a portion of a revolution it controls the escape of gas through said slot. The valve which is preferably in the form of a turning plug, has an aperture adapted to be brought into or out of registry with the slot 12. As shown, this aperture of the turning plug is formed by cutting away one side of the plug intermediate of its ends as shown particularly in Figs. 2 and 5, although it might be in the form of a slot or separate holes through the body of the plug.

The turning plug is preferably tapered and at one end has a coil spring 15 encircling it with one end attached to the plug and the other to a stop 16 on the casting. The spring performs a double function in that it normally tends to rotate the plug to such a position as to close the slot 12 and it tends to pull the valve plug endwise and hold it substantially gas-tight in its slightly conical seat. I have illustrated only a slight pitch to the cone, in fact have shown it nearly but not quite cylindrical, but it will of course be evident that the extent of taper may be increased or decreased as desired. The turning plug has at one end thereof a cross bar 17 serving as a handle or lever. This is preferably formed integral with the turning plug and so positioned in respect to a stop 18 on the casting that either end of the lever 17 may engage with the stop and thus limit the rotation to the desired arc. As shown particularly in Fig. 4, this rotation is through approximately 90° and from complete open to complete closed position of the valve. The spring holds the lever against the stop with the parts in position as shown in Figs. 2 and 4 while the maximum distance to which the valve may be rotated from that position is exactly what is necessary to move the valve to fully open position. Thus the operator need exercise no skill or care in either opening or closing the valve. It is merely necessary to move the valve to the limiting distance in the only direction in which it can be rotated from its normal position. This operating means may be of any desired character or form. In Fig. 1 I have illustrated some-

what diagrammatically an operating wire 19 extending from one end of the lever 17 over one or more pulleys 20 to a point from which it may be conveniently pulled or operated by the driver.

The casting forming the sound chamber and the valve casing also forms a threaded nipple 21 and a hexagonal or other non-circular portion 22, by means of which the nipple may be screwed into the coupling. As previously indicated, the casting also presents the stop 18 for the valve plug lever and the stop 16 for one end of the spring 15. Thus the entire signal aside from the coupling by which it is secured in position, is formed of a single casting and a single valve and valve lever. None of these parts need to be machined except the valve seat. Even the threads on the nipple 21 may in some cases be cast thereon, although ordinarily these would be cut in the usual way.

I have shown the threaded nipple 21 slightly tapered so that it may be wedged substantially gas-tight into a coupling with a comparatively few turns and will be rigidly fixed in position. I have also shown the interior of the casting of somewhat larger cross sectional area between the inlet to the threaded nipple and the slot 12 so as to form an expansion chamber 23, tending to somewhat equalize the varying pressure existing particularly when the engine is being run at very low speed. I find from experience that this expansion chamber is an advantageous feature in securing a satisfactory warning signal sound, although obviously such enlarged expansion chamber might be omitted.

For attaching the signal to the exhaust pipe of an internal combustion engine, I provide a comparatively flexible plate 25 which may be bent to fit the curvature of a wide range of exhaust pipes. This plate has a central aperture within which is secured a bushing 26. The bushing has a flange at its outer end, and may include merely two oppositely extending lugs 27 as shown in Fig. 6. These are designed to extend in the general direction of the length of the pipe and are riveted to the plate along the line of tangency of the plate and exhaust pipe before the latter is bent to follow the surface of the pipe. Thus this bending of the plate to fit different pipes does not disturb the rivet or other connections between the bushing and the plate and the smaller the exhaust pipe and the necessary curvature of the plate 25, the more the edges of the aperture of the plate will pull down and bind against the sides of the bushing midway between the riveted connections. The bushing extends through the plate at least a sufficient distance to enter the hole in the exhaust pipe. This hole may be of any desired shape or size but is con-

veniently made by four cuts with an ordinary metal saw so as to leave a diamond-shaped aperture 28 as shown particularly in Fig. 6. As the inner end of the bushing projects slightly into this aperture, any loosening of the plate or jarring which would tend to move the plate either circumferentially or lengthwise of the pipe is effectively prevented.

To form a substantially gas-tight seal between the coupling and the pipe, I provide an asbestos layer or sheet 29 of substantially the same size as the plate 25 and disposed between the latter and the exhaust pipe. This is capable of a limited compression and is also fire-proof so that it forms a very effective substantially gas-tight joint.

The opposite edges of the plate 25 are secured to the pipe by one or more U-shaped clamping bolts 30. These have their opposite ends threaded and extending through apertures in the opposite edges of the plate. Nuts 31 on the ends of the U-shaped clamp or clamps 30 may be tightened to hold the parts firmly in position. Due to the flexibility of the clamping bolts 30 and the plate 25, a tight joint will be effected even though the exhaust pipe be of various sizes. To accommodate particularly small pipes, the plate 25 is provided with additional holes 32 spaced inwardly a short distance from the outer edges so that the bolts may be inserted through these when desired. If a single clamping bolt be employed as shown in Fig. 6, this engages with the plate at points opposite the bushing 26 and tends to tighten the plate at the point where such tightening is most needed, namely, where it covers the aperture 28 in the exhaust pipe.

With this improved coupling, the device may be very easily and quickly attached to the exhaust pipe of any ordinary automobile engine and without requiring the skill of an expert mechanic. It is merely necessary to cut a hole 28 without any particular degree of accuracy and with no definite or predetermined shape but of sufficient size to receive the end of the bushing and then apply the device and tighten the nuts 31. The device automatically locks itself against any shifting of position.

The device is preferably attached as shown in Fig. 1, that is, between the manifold 33 of the engine and the ordinary muffler 34. The back pressure in the exhaust pipe gas by the muffler itself will be sufficient to sound the signal when the engine is running and the valve 14 be opened. I have shown the signal back near the muffler although it will of course be evident that there is nothing essential in this position as it may be anywhere along the length of the pipe.

In some instances, I may extend the bushing 26 into the pipe to a considerable dis-

tance and so form the inner end as to constitute a scoop or baffle to direct or guide the gases toward the signal or facilitate their flow toward it. As shown, the bushing is substantially cylindrical in form in the portion which extends through the opening 28 but has one side cut away so as to leave a semi-cylindrical baffle 35 facing in the direction from which the exhaust gas comes, that is, toward the engine and away from the muffler. When the valve is open, this will tend to deflect the gas as indicated in the arrows in Fig. 2 but with the valve 14 closed it will not to any material extent interfere with the flow of the gas through the pipe to the muffler.

Although my improved device is particularly designed for use on the exhaust pipe ahead of the muffler it may be connected to the engine so as to be operated by the gas in the cylinder during the compression and expansion strokes. When so used it may be connected with any form of coupling, elbow, or other union communicating with the interior of the cylinder. Merely as an example of such a mounting, I have shown in Fig. 8 a spark plug 40 having a casing member 41 similar to the usual spark plug casing but provided with a passage from one side of the outer end thereof to the interior of the spark plug which is in communication with the interior of the engine. A coupling member 42 may be provided with a socket at one end to receive the threaded nipple 21 of the signal and the other end may be threaded into a very much smaller aperture in the spark plug. I do not claim any novelty in the spark plug itself as plugs and passages of this kind have been used with cocks to serve as primers. Although the same identical device may be used either on the exhaust pipe or on the cylinder, still the highest efficiency is obtained if the parts are designed with some regard for the pressure of the gases. A slightly different size or shape of parts may serve better when the device is used on the cylinder than what worked best when used on the exhaust pipe but such change is not necessary for the securing of satisfactory results.

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

1. An automobile warning signal including a sound chamber with a gas escape slot, and an opening adjacent thereto of fixed sizes and relative positions, a valve casing from which the slot leads, and a supply nipple leading to the valve casing, said chamber, said valve casing and said nipple being formed as a single casting, and a rotary valve in said valve casing normally closing said slot and preventing the escape of gas through said nipple to the atmosphere.

2. An automobile warning signal includ-

ing a sound chamber, a threaded nipple and a valve casing therebetween, a rotary valve within said casing for controlling the escape of gas through said nipple into operative relationship to said sound chamber, said nipple, valve casing, and sound chamber being formed of a single casting and having integral therewith a pair of oppositely disposed lugs, a coil spring engaging with one of said lugs and tending to rotate said valve in one direction, and a lever rigid with said valve and engaging with the other stop to limit said rotation and normally hold the valve in closed position.

3. An automobile warning signal, including a sound chamber having a frusto-conical valve seat, a connecting nipple and an interposed valve chamber all formed as a single casting, a frusto-conical valve within said valve casing, a coil spring encircling said valve at the smaller end thereof and tending to pull the valve endwise to its seat and rotate it in one direction, an operating lever on said valve, and a stop on said valve casing normally preventing rotation of said valve under the influence of said spring and holding the valve in closed position, said stop also limiting the reverse rotation of said valve past a predetermined open position.

4. An automobile warning signal including a sound chamber, a connecting nipple adapted to be connected to a source of gas supply under pressure, an interposed valve casing having a frusto-conical valve seat, a frusto-conical valve within said valve casing and projecting therefrom at each end, a coil spring encircling the projection at the smaller end of the valve and tending to pull the valve endwise to its seat and rotating it in one direction, an operating lever rigid with the opposite projecting portion of said valve, and a stop on said

valve casing normally preventing rotation of said valve under the influence of said spring and holding said valve in closed position.

5. An automobile warning signal including a sound chamber, a connecting nipple adapted to be connected to a source of gas supply under pressure, and an interposed valve casing, all formed of a single casting, a rotatable valve within said valve casing and projecting from the opposite ends thereof, a coil spring encircling said valve at one end thereof and tending to rotate it in one direction, an operating lever on the opposite end of said valve, and a stop on said valve casing normally preventing rotation of said valve under the influence of said spring and holding the valve in closed position.

6. An automobile warning signal including a hollow approximately elliptical sound chamber having an opening in one side thereof, a connecting nipple extending substantially parallel to the major axis of the sound chamber and substantially tangential to one side thereof, a valve chamber interposed between said nipple and said sound chamber and having a slot for delivering gas at an angle to the plane of said opening and approximately tangential to the sound chamber, a rotatable valve within said valve casing normally covering said slot and preventing the escape of gas, a spring normally tending to rotate the valve in one direction, a stop for limiting the rotation of the valve to closed position, and means for rotating the valve against the action of the spring to open position.

Signed at New York, in the county of New York and State of New York, this 10th day of January, A. D. 1919.

JULIUS H. KAESEN.