PATENT SPECIFICATION

Application Date: Mar. 5, 1921. No. 7146/21. **181,103**

Complete Left: Aug. 12, 1921.

Complete Accepted: June 6, 1922.

PROVISIONAL SPECIFICATION.

Improvements in and relating to Sounding Devices Actuated from Internal Combustion Engines.

I, GEORGE CONSTANTINESCO, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County of Surrey, a subject of the King of Great Britain and Ireland, do hereby declare the nature of this invention to be as follows:—

The present invention relates to sounding devices such as motor horns operated by the suction of internal combustion engines.

In such sounding devices an ordinary horn with a reversed reed may be employed operated by the air suction produced by the engine.

The object of the invention is to provide improved means for sounding such horns from any convenient position.

The invention consists in providing means by which the area of the passage by which air is drawn from the horn to the engine is automatically controlled so that the suction actually produced at the horn never exceeds that at which the reed or the like operates effectively.

The invention further consists in a controlling device for the horn comprising a chamber having a perforated diaphragm dividing it into two parts, the connections to the engine and to the horn being placed on one side of the diaphragm, while the other side of the diaphragm is open to atmospheric pressure, the actuating valve by which the horn is sounded being mounted on a spindle passing through the diaphragm and being held on its seat by the suction of the engine, with or without a light spring to return it to its seat when the suction is insufficient for the purpose.

The invention further consists in operating the controlling valve of a controlling device of this kind pneumatically from any convenient position.

The invention also consists in a controlling device comprising a chamber and perforated diaphragm of the type described having a controlling valve with a hollow stem, itself controlled by a second diaphragm one side of which is normally exposed to suction, air being admitted on this side of the diaphragm when it is desired to open the valve and sound the horn.

The invention further consists in the improved controlling means for sounding devices operated by the suction of the engine hereinafter described.

In carrying the invention into effect according to one example a flattened conical chamber is provided having a central perforated diaphragm. On one side of this chamber the connection to the engine is fitted in a central position, and may be screwed into a position at the centre of the wall of the chamber, so that its end opening into the chamber can be adjusted and locked at a varying distance from the diaphragm. The connection to the horn is fitted on the same wall of the chamber in any convenient position. The wall of the chamber on the other side of the diaphragm is provided with a suitable bolt and nut for attachment to any suitable part of the car, and a central hole is formed through the bolt through which passes the valve spindle. This may have a rubber valve head suitably attached to the spindle, and a light spring may be employed to return the valve to its seat against gravity when suction is not sufficient for this purpose. An aperture is formed in the wall of the chamber at the rear of the diaphragm by which

atmospheric pressure can act on the rear of the diaphragm. The valve spindle may be pulled by a chain or other suitable means to sound the horn.

In operation, when the valve is pulled open by the chain the diaphragm will occupy a position nearer or farther from the open end of the connection to the engine, according to the suction produced in the forward side of the diaphragm by the engine. The vacuum in the space of the chamber connected to the horn is thus controlled, and cannot become excessive.

In carrying the invention into effect according to another example, in which the valve is pneumatically operated, the valve is placed on the forward side of its seat and is connected to a rubber diaphragm placed at the rear of the perforated diaphragm. Atmospheric pressure is admitted to the space between the two diaphragms through suitable apertures around the edge of the chamber. A small aperture is provided through the valve spindle leading to the space at the back of the rubber diaphragm, so that the suction of the engine is communicated to this space, thus tending to draw the diaphragm in the rearward direction to pull the valve down to its seat, although the valve itself is subjected to the suction of the engine. From the passage at the rear of the diaphragm any suitable pipe of considerably larger diameter than the diameter of the aperture through the valve is provided leading to any suitable device by which air can be admitted so as to raise the pressure at the rear of the rubber diaphragm to open the valve. A suitable device may consist of a spring-pressed button having a flange adapted to close an opening leading to the actuating air pipe, or any other suitable form of valve for admitting the air when the button is pressed may be employed. The suction may be arranged to act inside a flexible diaphragm normally pressing the button outwards.

In another form of the invention the valve which operates the horn may be reversed so that the suction of the engine will keep the valve on its seat. The rubber diaphragm is then normally subjected on both sides to atmospheric pressure by allowing a continuous stream of air to be drawn through the hollow valve spindle, the air conduit leading to the actuating button being normally kept open. In order to sound the horn all that is necessary is to close the air conduit at any point. Suction is then produced, and acting on the diaphragm, pulls the valve open and thus sounds the horn.

The air passage between the horn and the engine and the connections from the controlling chamber to the horn and engine may be arranged as in the modification of the invention above described. The aperture by which air is admitted to the space between the two diaphragms may conveniently be provided by fitting a ring flat on one side and having corrugations or slots on the other side between the two diaphragms, the flat side of the ring being placed against the diaphragm by which the valve is controlled. This diaphragm may be of rubber or other flexible material, the perforated controlling diaphragm being preferably of metal.

Dated this 4th day of March, 1921.

W. GRYLLS ADAMS,
87, Victoria Street, S.W.,
Agent for the Applicant.

COMPLETE SPECIFICATION.

Improvements in and relating to Sounding Devices Actuated from Internal Combustion Engines.

I, GEORGE CONSTANTINESCO, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County of Surrey, a subject of the King of Great Britain and Ireland, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to sounding devices such as motor horns operated by the suction of internal combustion engines.

In such sounding devices an ordinary horn with a reversed reed may be employed operated by the air suction produced by the engine.

In my Specification No. 165,591 I have described and claimed a controlling device for use in connection with sound producing instruments operated by the suction of an internal combustion engine, comprising a chamber in the path of the air between the horn and the suction device, one wall of which chamber is formed by a flexible diaphragm which on increase of suction is drawn towards the outlet from

the chamber, decreasing the area available for flow through such outlet.

The object of the present invention is to provide improved means for sounding such horns from any convenient position.

The invention consists in a sounding device of the type described having a horn or the like operated by air suction from an internal combustion engine and having a perforated diaphragm adapted to restrict automatically the passage through which air is drawn from the horn to the engine so that the suction actually produced at the horn never exceeds that at which the reed or the like operates effectively.

The invention further consists in a controlling device for the horn comprising a chamber having a perforated diaphragm dividing it into two parts, the connections to the engine and to the horn being placed on one side of the diaphragm, while the other side of the diaphragm is open to atmospheric pressure, the actuating valve by which the horn is sounded being mounted on a spindle passing through the diaphragm and being held on its seat by the suction of the engine, with or without a light spring to return it to its seat when the suction is insufficient for the purpose.

The invention further consists in operating the controlling valve of a controlling device of this kind pneumatically from any convenient position.

The invention also consists in a controlling device comprising a chamber and perforated diaphragm of the type described having a controlling valve with a hollow stem, itself controlled by a second diaphragm one side of which is normally exposed to suction, air being admitted on this side of the diaphragm when it is desired to open the valve and sound the horn.

The invention further consists in the improved controlling means for sounding devices operated by the suction of the engine hereinafter described.

Referring to the accompanying drawings;

Figure 1 is a general arrangement partly in section of one form of apparatus for carrying the invention into effect;

Figure 2 shows a modified form of controller adapted to be actuated by a chain or the like;

Figure 3 shows a general arrangement of the invention partly in section in which the horn is sounded by admitting atmospheric pressure into a space in which vacuum is normally maintained and in which no extra reservoir is employed;

Figure 4 is an enlarged view of the controller shown in Figure 3.

In the example of the invention shown in Figure 1 the controlling device is in the form of a flattened conical chamber *a* having a central perforated diaphragm *b*.

On one side of this chamber a connection *c* is fitted in a central position and may lead either to the induction pipe *e* of the engine direct or, as illustrated, to a valve *f* of the type described in my Specification No. 180,450 of even date herewith. In this case the horn can either be blown by direct suction from the engine or by suction from the reservoir *g*. The horn *h* having a reversed reed *k* is connected to the chamber *a* through the connection *l*. The valve *m* controlling the connection to the engine has a hollow stem *m* so that suction through the connection *c* is communicated to the rear side of a flexible diaphragm *o* by which the valve is actuated. A pipe *p* is attached to the connection at the back of the chamber and leads to the actuating device *q*. This device consists of a press button *r* having at its end a valve *s* adapted to close the aperture leading from atmosphere to the pipe *p*. When the button *r* is in the position illustrated the pressure at the rear of the diaphragm *o* is atmospheric, only a small leak occurring through the valve spindle *n* compared with the area of the passage *p*. When the button is pressed, the suction through the valve spindle causes a rearward movement of the diaphragm *o* which opens the valve thus admitting suction to the horn.

Should the suction become excessive the perforated diaphragm *b* is pulled towards the opening leading to the engine, thus limiting the suction. A light spring *t* may be provided between the diaphragm *b* and valve.

In the form of the invention shown in Figure 2 the flattened conical chamber *a* is provided with a central perforated diaphragm *b* and the connections to the engine and to the horn are as described above. The connection *c* can be screwed into or out of the wall of the chamber, so that its end opening into the chamber can be adjusted and locked at any desired distance from the diaphragm. The wall of the chamber at the other side of the diaphragm is provided with a suitable bolt 2 and nut for attachment to any suitable part of the car, and a central hole is formed through the bolt through which the valve spindle 3 passes. The rubber valve head 4 is attached in any suitable manner to the spindle, and a light spring 5 may be employed to return the valve to its seat when suction is not sufficient for this purpose. An aperture 6 is formed in the wall of the chamber at the rear of the

diaphragm by which atmospheric pressure can act on this side. Any suitable means such as a chain may be attached to the spindle for the purpose of pulling the valve open to sound the horn.

In operation when the valve is pulled open by the chain the diaphragm will occupy a position nearer or farther from the open end of the connection to the engine, according to the suction produced in the forward side of the diaphragm. The vacuum in the space of the chamber which is connected to the horn is thus controlled, and cannot become excessive.

In the form of the invention illustrated in Figure 3 the valve is operated to sound the horn by admitting atmospheric pressure to a space in which there is normally a vacuum. No reservoir for providing an alternative vacuum is illustrated, but the reservoir may be employed with this modification also if desired. In this modification the valve 11 is fitted on the forward side of its seating, and is connected to a rubber diaphragm 12 placed at the rear of the perforated diaphragm 13. Atmospheric pressure is admitted to the space between the two diaphragms through suitable apertures around the edge of the chamber. These apertures may be conveniently provided by fitting a ring 17, flat on one side, and having corrugations or slots on the other side between the two diaphragms with its flat side against the flexible diaphragm 12. A small aperture 14 is provided through the valve cap leading to the space 15 at the back of the rubber diaphragm 12, so that the suction of the engine is communicated to this space, thus tending to draw the diaphragm in the rearward direction to pull the valve down on its seat although the valve itself is subjected to the suction of the engine. From the passage 16 at the rear of the diaphragm any suitable pipe of considerably larger diameter than that of the aperture through the valve is provided leading through a pipe *p* to the actuating device 18. This comprises a press button 19 having a flange 20 pressed upwards by a spring and closing apertures around the button leading into the chamber 21, which is in communication with the pipe *p*. Normally there is a vacuum in the space 15, pipe *p* and chamber 21. On pressing the button 19 atmospheric pressure is admitted and acts on the diaphragm 12, opening the valve and so admitting suction from the engine to the horn.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A sounding device of the type described having a horn or the like operated by air suction from an internal combustion engine and having a perforated diaphragm adapted to restrict automatically the passage through which air is drawn from the horn to the engine, so that the suction actually produced at the horn never exceeds that at which the reed or the like operates effectively, substantially as described.

2. In an apparatus as claimed in Claim 1 a controlling device for the horn comprising a chamber having a perforated diaphragm dividing it into two parts the connections to the engine and to the horn being placed to one side of the diaphragm while the other side of the diaphragm is open to atmospheric pressure, the actuating valve by which the horn is sounded being mounted on a spindle passing through the diaphragm and being held in its seat by the suction of the engine with or without a light spring to return it to its seat when the suction is insufficient for this purpose, substantially as described.

3. Controlling means for sounding devices as claimed in Claim 1 comprising a chamber having a perforated diaphragm and a valve actuated by a flexible diaphragm either by admission or cutting off by air pressure, substantially as described.

4. Controlling means for sounding devices as claimed in Claim 1 comprising a chamber and perforated diaphragm having a controlling valve with a hollow stem itself controlled by a second diaphragm one side of which is normally exposed to suction, air being admitted on this side of the diaphragm when it is desired to open the valve and sound the horn, substantially as described.

5. The improved means for controlling suction operated horns hereinbefore described and illustrated in the accompanying drawings.

Dated the 12th day of August, 1921.

W. GRYLLS ADAMS,
87, Victoria Street, London, S.W. 1,
Chartered Patent Agent.

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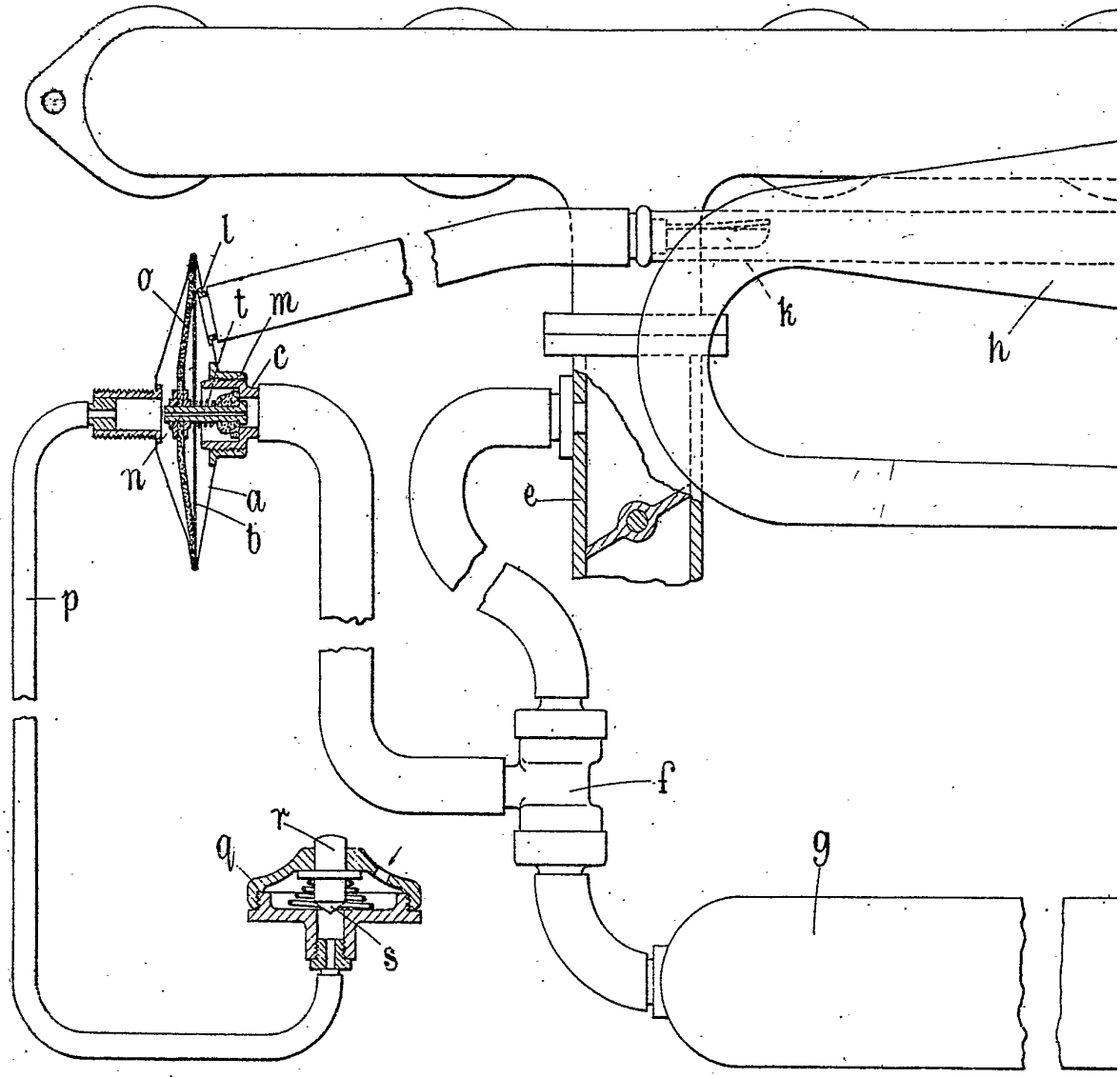
Fig. 1.



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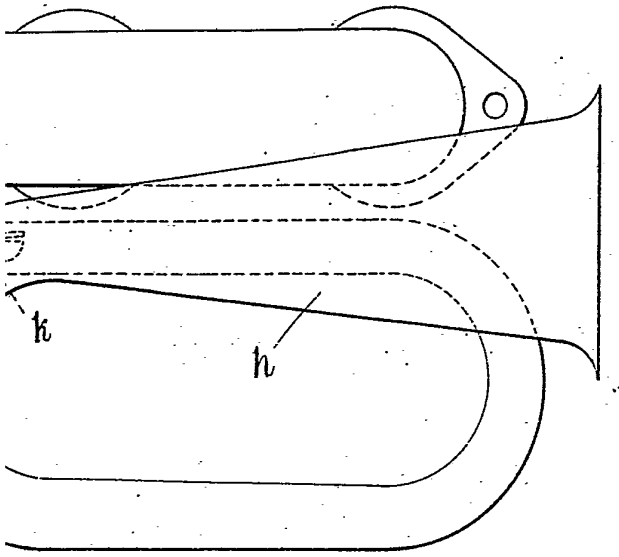
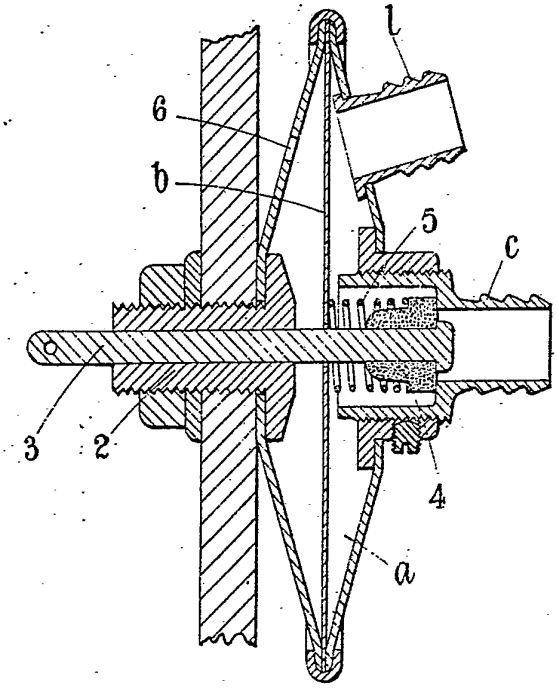


Fig. 2.



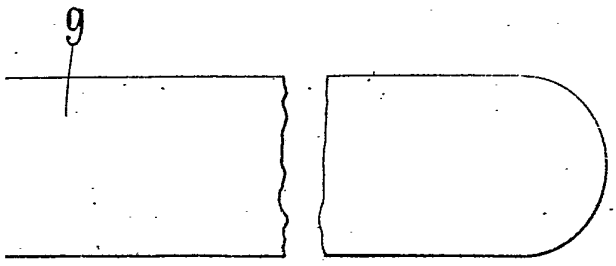


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Fig. 1.

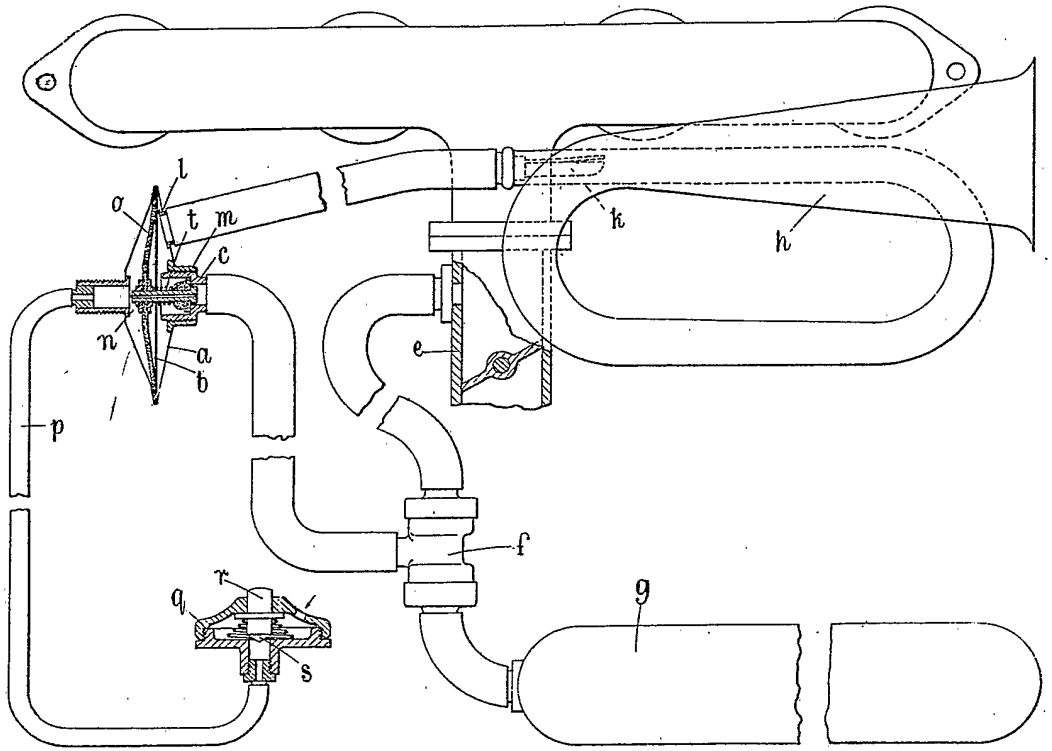

Fig. 2.

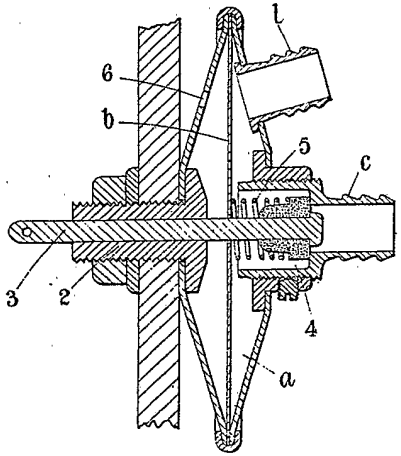

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Fig. 3.

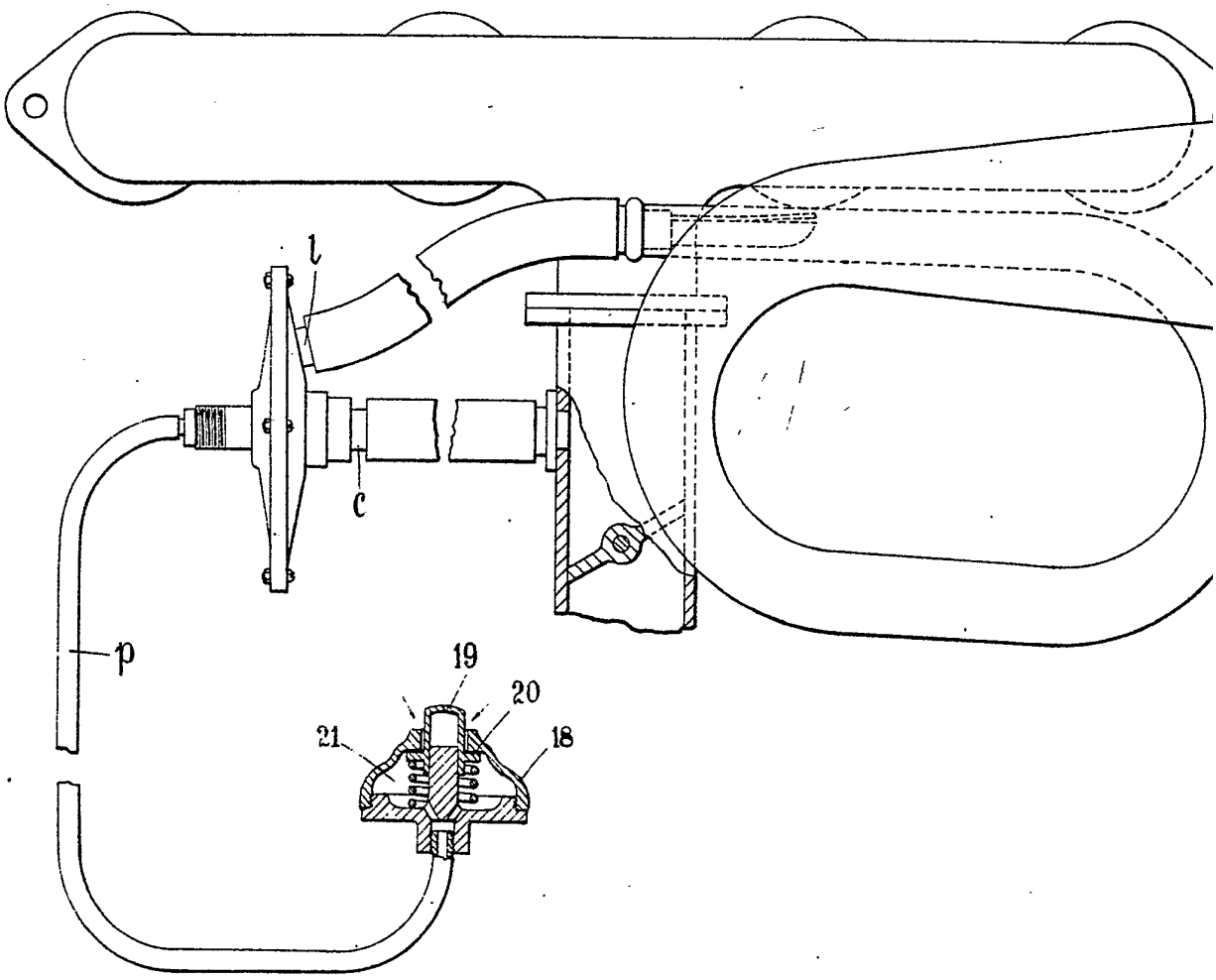
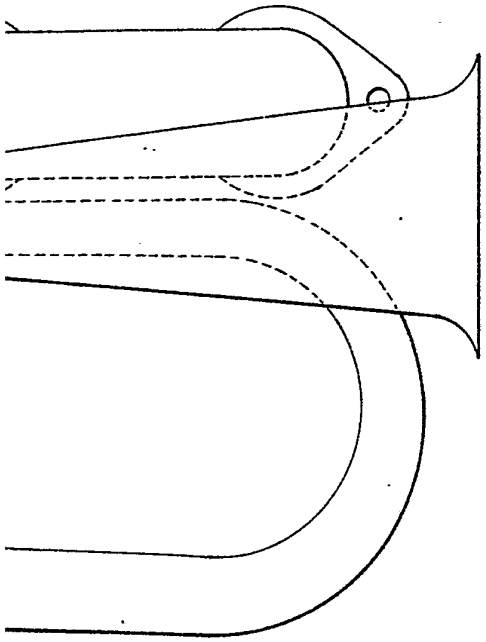


Fig. 4.



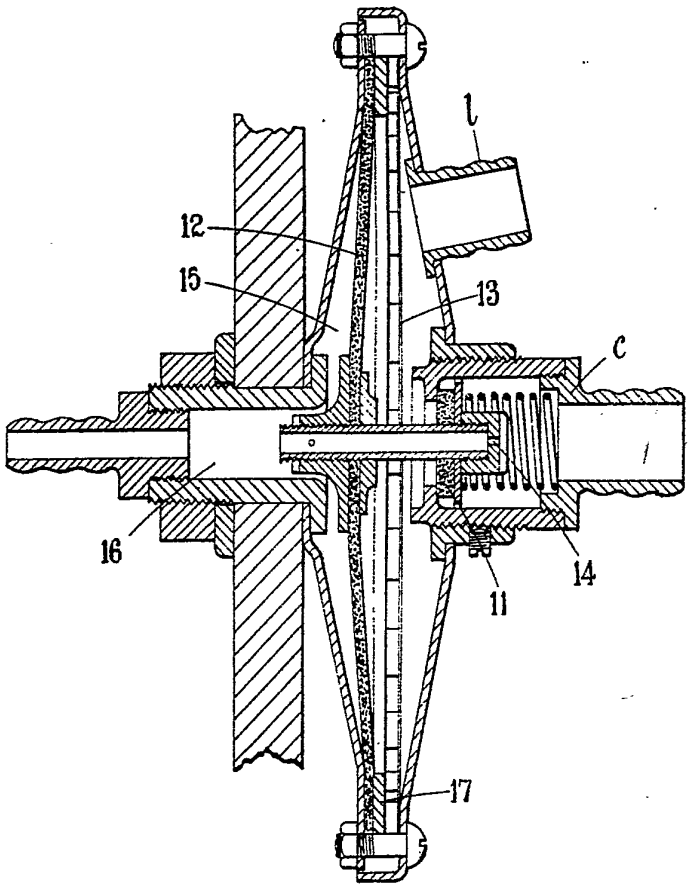


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Fig. 3.

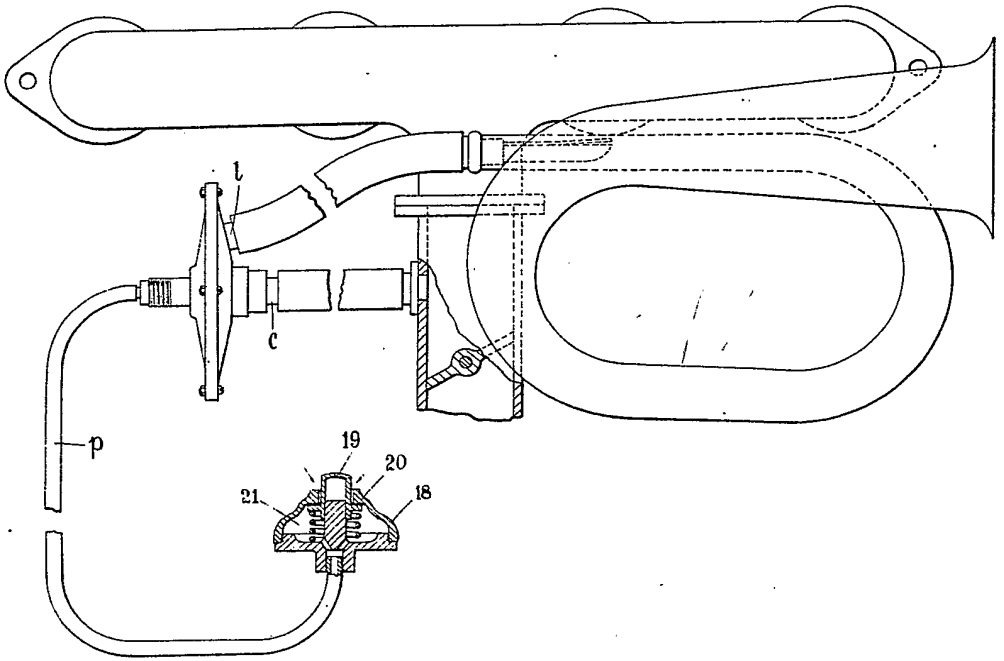
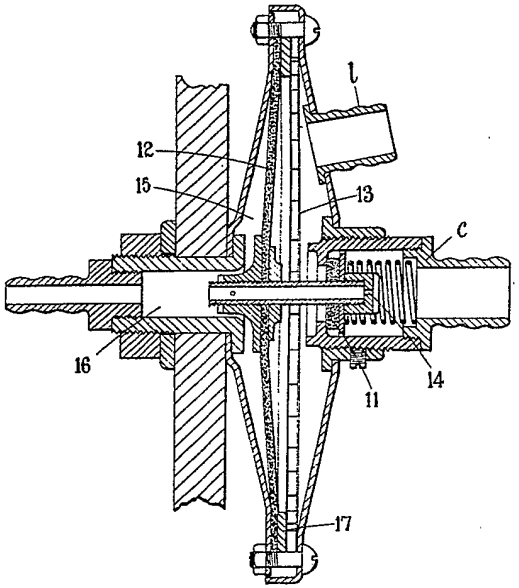


Fig. 4.



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