PATENT SPECIFICATION

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Complete Left: June 10, 1920.

Complete Accepted: July 7, 1921.

PROVISIONAL SPECIFICATION.

Improvements in or relating to Fluid Pressure Operated Sound Producing Devices.

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 sound producing instruments actuated by the working fluid of an internal combustion engine.

The object of the invention is to utilize the air drawn into the engine for the purpose of producing sound and thus avoid all difficulties due to the heat and composition of the exhaust products.

The invention consists in a sound producing instrument operated by the suction of an internal combustion engine.

The invention further consists in a siren or a horn having its reed reversed in such a way that when connected by a pipe with the induction system of the engine, the sound is produced by a flow of air into the horn caused by the engine suction.

The invention further consists in providing a carburettor through which the air from the horn is drawn so that the operation of the horn does not interfere with the mixture used in the engine.

The invention further consists in the improved sound producing instrument for operation by internal combustion engines hereinafter described.

In carrying the invention into effect according to one example as applied to a motor horn, the horn may be of the ordinary type with the exception that the vibrating reed of the horn is reversed so that when suction is created at the mouth of the instrument at which the inverted reed is situated the incoming air is interrupted at the desired frequency.

It will be seen that in such a case the horn will magnify the sound in the well known manner, it being immaterial for the purpose of the propagation of the sound waves and their magnification in the horn in which direction the stream of air is flowing.

A suitable cock may be provided to actuate the horn, situated in the pipe leading to the induction system of the engine. For large horns using a considerable amount of air the provision of an additional carburettor or small petrol jet will probably be necessary, but in the case of the smaller sizes the quantity of air required for producing the sound will probably be insufficient to greatly upset the mixture. It is evident, however, that if any difficulty arises through disturbance of the mixture a suitable carburettor can readily be fitted to overcome this defect, and indeed, the engine may be run entirely on the supply of air passing through the horn, the main air inlet being completely cut out. Further, a suitable device may be employed whereby the two air supplies may be regulated so that their sum is constant, whatever the position of the main and sound-producing throttles, which in this case would be inter-connected.

The invention is particularly applicable to internal combustion engines used on motor cars, boats,

[*Price* 1/-]

etc., or it may be used with steamboats or steam plants in which condensing apparatus is provided. Further, the invention is applicable to the construction of an instrument merely intended for sound operated by a small internal combustion engine whose carburettor is so arranged that the whole of the air required for the charge is drawn through the sounding horn when sound is required, or through a bye-pass leading from the atmosphere when the sound is not required.

Dated this 27th day of April, 1920.

MARKS & CLERK.

COMPLETE SPECIFICATION.

Improvements in or relating to Fluid Pressure Operated Sound-producing Devices.

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 improvements in sound-producing instruments operated by suction, *e.g.*, the horn of a motor car operated by the suction of an internal combustion engine.

The invention consists in an arrangement for operating sound-producing instruments by suction in which, in order to keep substantially constant irrespective of changes in the suction the flow of fluid operating the sound-producing instrument and thereby also the sound produced, an automatic regulator is provided in the suction pipe of the sound-producing instrument, which regulator tends to reduce the area available for fluid flow when the suction increases and *vice versa*.

The invention also consists in the improved sound-producing instruments for operation by internal combustion engines or condensing plant hereinafter described.

Referring to the accompanying drawing, illustrating the invention as applied to an internal combustion engine for a motor horn, the horn *a* may be of the ordinary type with the exception that the vibrating reed *b* of the horn is reversed in direction so that when suction is created in the flexible tube *c* the incoming air is interrupted at the desired frequency.

The flexible tube *c* leads to a regulator *d* consisting of a diaphragm *e* of suitable material, such as steel, adapted to be drawn towards the end of the pipe *f* by the suction in the flexible tube *g*. This flexible tube is connected to a fitting *h* in which there is situated a butterfly throttle valve *k* and an auxiliary jet closed by a needle valve *l*. The needle valve *l* controls a small aperture *m* to which there is connected a pipe *n* leading to a point below the level of petrol in a tank or carburettor *o*. The fitting *h* opens in the main induction pipe *p* of the engine at a point between the engine and the throttle of the main carburettor. The purpose of the auxiliary tank *o* and jet *m* is to avoid variation of the mixture when air is being drawn through the horn.

If the speed and consequently the suction of the motor increase the diaphragm, *e*, approaches the pipe, *f*, and so prevents excess of air being drawn through the horn; with a decrease of speed of the motor on the contrary the diaphragm moves away from the pipe, *f*, and so allows the supply of air through the horn to be maintained. The conditions under which the horn works, and consequently the sound produced, are in this way maintained approximately constant irrespective of the speed of the motor. It is found that a suction of about half a pound or one pound per square inch in the regulator, *d*, is amply sufficient to produce all the sound required.

In the case of small sizes of horn and on comparatively high-powered engines no auxiliary carburettor or tank is required as the quantity of air taken through the horn is not large enough to interfere materially with the mixture passing from the main carburettor. It will be obvious, however, that suitable devices may be employed by which the air supply through the main induction pipe and through the

horn can be regulated so that their sum is constant whatever the position of the throttle, *k*.

The invention is particularly applicable to internal combustion engines used on motor cars, boats, *etc.*, or it may be used with steam-boats or steam plants in which condensing apparatus is employed, the air being drawn in to the condenser through the horn from the atmosphere.

Further, the invention is applicable to the construction of an instrument merely intended for producing sound operated by a small internal combustion engine whose carburettor is so arranged that the whole of the air required for the charge is drawn through the sounding horn when sound is required, or through a by-pass leading from the atmosphere when the sound is not required.

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. An arrangement for operating sound-producing instruments by suction in which, in order to keep substantially constant irrespective of changes in the suction the flow of fluid operating the sound-producing instrument and thereby also the sound produced, an automatic regulator is provided in the suction pipe of the sound-producing instrument which regulator tends to reduce the area available for fluid flow when the suction increases and *vice versa*, substantially as hereinbefore described.

2. An arrangement as claimed in Claim 1, in which a diaphragm such as *e* moves to or from the open end of a part such as *f* of the suction pipe as the suction increases or decreases, substantially as described.

3. In combination with the arrangement claimed in Claim 1, when applied to internal combustion motors, an auxiliary fuel supply, other than the main supply, connected to the suction pipe and acting in response to changes of vacuum therein, substantially as and for the purpose hereinbefore described.

4. Improved suction-operated sound-producing instruments actuated by internal combustion engines or condensing plant substantially as hereinbefore described with reference to the accompanying drawing.

Dated this 10th day of June, 1920.

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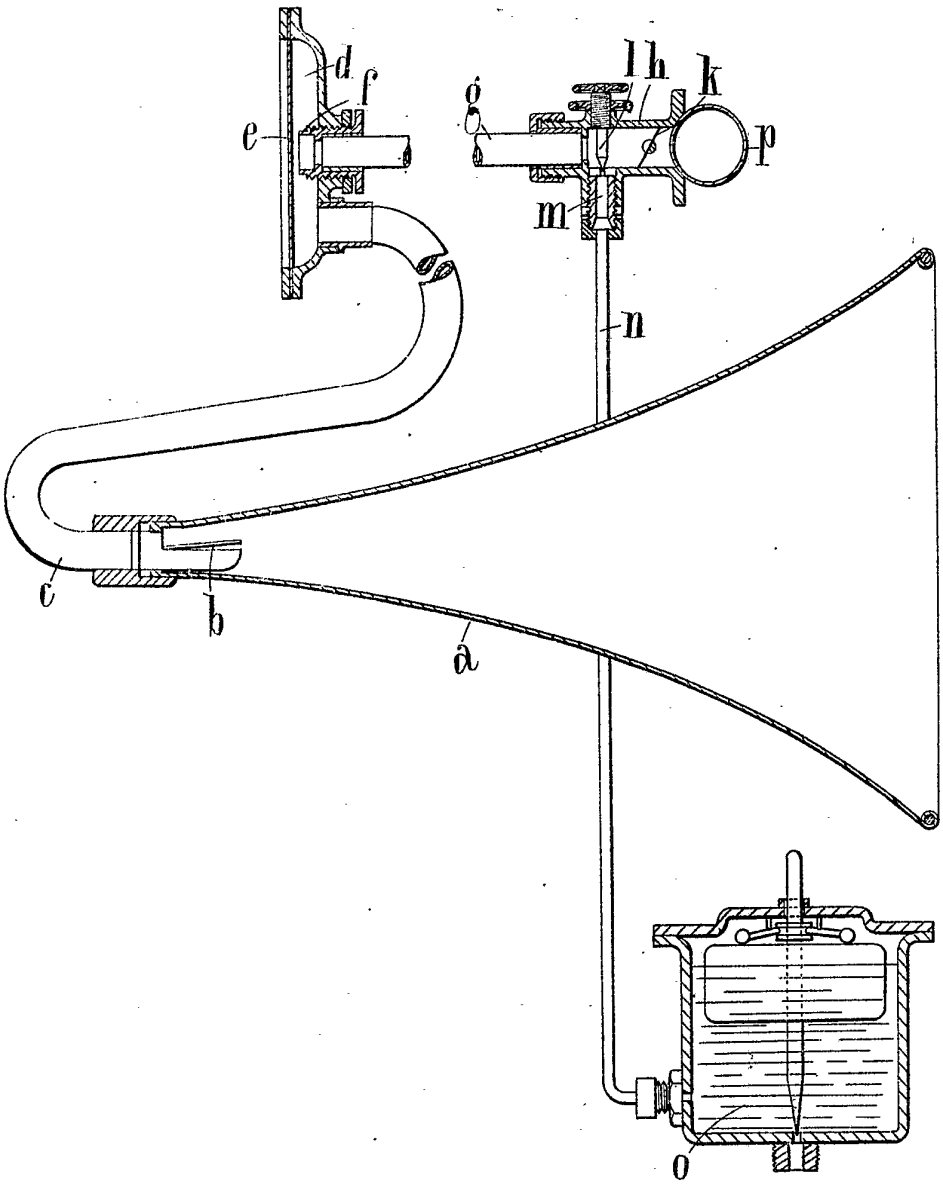

[This Drawing is a reproduction of the Original on a reduced scale]

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