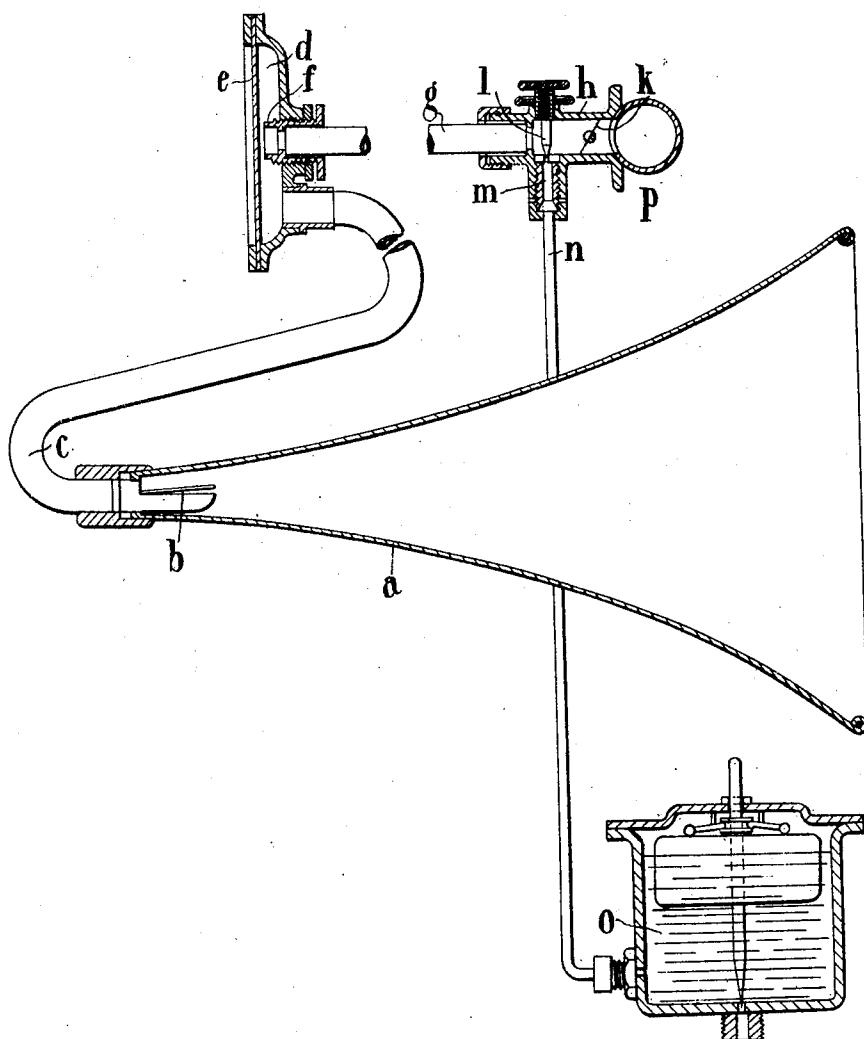


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SOUND PRODUCING INSTRUMENT OPERATED BY INTERNAL COMBUSTION ENGINES.
APPLICATION FILED JULY 26, 1920.

1,409,081.

Patented Mar. 7, 1922.



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SOUND-PRODUCING INSTRUMENT OPERATED BY INTERNAL-COMBUSTION ENGINES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE CONSTANTINESCO, a subject of the King of Great Britain and Ireland, and residing at "Carmen 5 Sylva," Beechwood Avenue, Oatlands Park, Weybridge, in the county of Surrey, England, have invented certain new and useful Improvements in Sound-Producing Instruments Operated by Internal-Combustion 10 Engines, of which the following is a specification.

The present invention relates to sound-producing instruments actuated by the working fluid of an internal combustion engine 15 and is also applicable to sound-producing instruments adapted to be operated by steam plant in which condensing apparatus is employed.

The main object of the invention is to 20 overcome difficulties that have occurred owing to the sound varying with variations in the suction.

With this object the invention consists 25 in the combination of elements hereinafter described and more particularly pointed out in the claims.

Referring to the accompanying drawing, 30 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 35 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 40 of the propagation of the sound waves and their magnification in the horn in which direction the stream of air is actually flowing.

The flexible tube *c* leads to a regulator *d* 45 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 50 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 carburetter *o*. The fitting *h* opens 55 in the main induction pipe *p* of the engine at a point between the engine and the throt-

tle of the main carburetter. 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. 60

It is found that a suction of about half to one pound per square inch in the regulator *d* is amply sufficient to produce all the sound required. If the suction increases the diaphragm *e* is forced by the external pressure closer to the end pipe thereby automatically diminishing the area available for flow of air so as to maintain the flow through the horn, and consequently the sound produced, substantially constant. In the case 70 of small sizes of horn and on comparatively high powered engines no auxiliary carburetter or tank is required as the quantity of air taken through the horn is not large enough to materially interfere with the mixture passing from the main carburetter. 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 80 their sum is constant whatever the position of the sound producing throttle *k*. 75

The invention is particularly applicable to internal combustion engines used on motor cars, boats, etc., or it may be used with 85 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 90 construction of an instrument merely intended for producing sound operated by a small internal combustion engine whose carburetter is so arranged that the whole of the air required for the charge is drawn 95 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 described my invention, what 100 I claim as new and desire to secure by Letters Patent is:—

1. In combination, a sound-producing instrument operable by flow of gaseous fluid therethrough; means for creating a suction; 105 and a duct between said sound-producing instrument and said suction-creating means, said duct including automatic means for maintaining substantially constant flow of gaseous fluid through said sound-producing 110 instrument, irrespective of changes of suction.

2. In combination, a sound-producing instrument operable by flow of gaseous fluid therethrough; means for creating a suction; and a duct between said sound-producing instrument and said suction-creating means, said duct including automatic means responsive to changes of suction for varying the area of said duct available for fluid flow.

3. In combination, a sound-producing instrument operable by flow of gaseous fluid therethrough; means for creating a suction; and a duct between said sound-producing instrument and said suction-creating means, said duct including automatic means responsive to changes of suction and acting under certain working conditions to decrease the area of said duct available for fluid flow when the suction increases and vice versa.

4. In combination, a sound-producing instrument operable by flow of gaseous fluid therethrough; means for creating a suction; and a duct between said sound-producing instrument and said suction-creating means, said duct including a flexible diaphragm responsive to change of suction for varying the area of said duct available for fluid flow.

5. In combination, a sound-producing instrument; the induction system of an internal combustion engine; and a duct between said sound-producing instrument and said induction system, said duct including automatic means for maintaining substantially constant flow of gaseous fluid through said sound-producing instrument, irrespective of changes of vacuum in said induction system.

6. In combination, a sound-producing instrument comprising a horn and a reed disposed therewithin with its free end towards the mouth of said horn; the induction system of an internal combustion engine; and a duct between said horn and said induction system, said duct including automatic means for maintaining substantially constant flow

of gaseous fluid through said sound-producing instrument irrespective of changes of 45 vacuum in said induction system.

7. In combination, a sound-producing instrument comprising a horn and a reed disposed therewithin with its free end towards the mouth of said horn; the induction system of an internal combustion engine; and a duct between said horn and said induction system, said duct including automatic means responsive to changes of vacuum in said induction system for varying the area of said duct available for fluid flow.

8. In combination, a sound-producing instrument comprising a horn and a reed disposed therewithin with its free end towards the mouth of said horn; the induction system of an internal combustion engine; and a duct between said horn and said induction system, said duct including a flexible diaphragm responsive to changes of vacuum in said induction system for varying the area of 65 said duct available for fluid flow.

9. In combination, a sound-producing instrument operable by flow of gaseous fluid therethrough; the induction system of an internal combustion engine; a duct between 70 said sound-producing instrument and said induction system; and an auxiliary fuel supply other than the main supply connected to said duct and responsive to changes of vacuum therein.

10. In combination, a sound-producing instrument; the induction system of an internal combustion engine; a duct between said sound-producing instrument and said induction system; and an auxiliary fuel supply other than the main supply connected to said duct.

In testimony whereof I have signed my name to this specification.

GEORGE CONSTANTINESCO.