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PROPELLING DEVICE FOR VEHICLES

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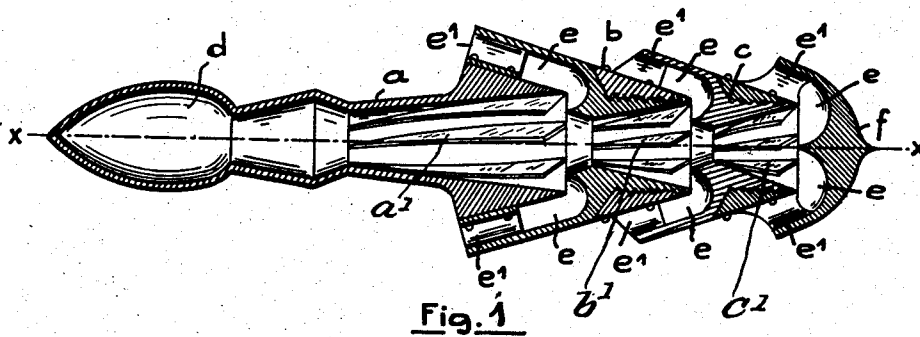


Fig. 1

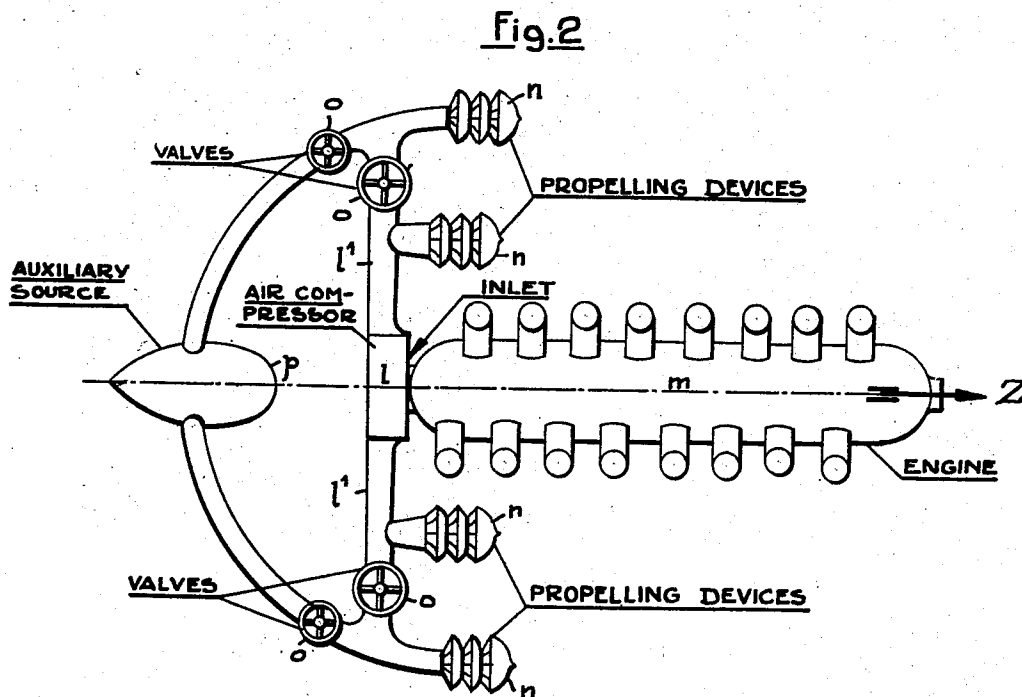


Fig. 2

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PROPELLING DEVICE FOR VEHICLES

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4 Claims. (Cl. 60—35.5)

The present invention concerns land, water, or aerial vehicles propelled by means of devices of the kind of those used as recoil-absorbing means for fire-arms, and especially those described in the U. S. Patent No. 1,333,402, of March 9, 1920, and the U. S. Patent No. 2,065,273 of Dec. 22, 1936.

According to the present invention, I make use of the same devices, with convergent-divergent nozzles and systems of blades, for propelling land, water, or aerial vehicles, by feeding said devices with a fluid under pressure.

Other features of the present invention will result from the following detailed description of some specific embodiments thereof.

A preferred embodiment of the present invention will be hereinafter described, with reference to the accompanying drawing, given merely by way of example, and in which:

Fig. 1 is an axial longitudinal sectional view of a device with convergent-divergent nozzles and with a system of deflecting blades, which is used for propelling a vehicle;

Fig. 2 shows, by way of example, in a diagrammatic manner, an embodiment illustrating the application of the device to the propulsion of a vehicle.

As shown by Fig. 1, the device used for the propulsion of a vehicle includes convergent-divergent nozzles *a*, *b*, *c*, disposed behind one another, along a common axis *x—x*, said nozzles being intended to increase the kinetic energy of a fluid under pressure, fed through a main *d*, disposed behind the first of the nozzles. The fluid escapes into the atmosphere by passing through systems of blades *e*, *e*, *e*, generated by the revolution of circular arcs about axis *x—x*. The blades are supported by partitions *e*¹, rigid with a base fixed, for instance by screwing or riveting, to the outer face of the preceding nozzle. The device is closed, at the front by a part *f*, the inner, or rear, face of which determines the system of blades located at the outlet of the third nozzle *c*.

The device shown in the drawing includes three expansion nozzles, but it should be well understood that it may include any number of these nozzles.

The nozzles may be provided with internal helical ridges as shown at *a'*, *b'* and *c'* respectively. The partitions *e*¹ support the gas deflecting elements *e* so as to impart, to the fluid under pressure issuing through these deflecting elements *e*, a movement of rotation about the longitudinal axis *x—x* of the device. It results there-

from that the centrifugal force, generated thereby, has for effect to urge the said fluid under pressure, to take a direction transverse to the axis *x—x*, when it escapes from these deflecting elements *e* and is dispersed into the atmosphere, thus preventing the said fluid to exert an action, either ballistic or of any other kind, on organs located close to said device. An arrangement of this kind is shown and described in Patent No. 2,143,596 dated January 10, 1939.

Fig. 2 shows the case in which the propulsion of the vehicle is obtained by feeding with fluid under pressure, by means of the engine, propelling devices of the kind of that shown by Fig. 1. The engine *m* drives an air compressor *l* (which may be of the Roots, centrifugal, or any other type) which feeds air under pressure, through pipes *l*¹, to the propelling devices designated, each, as a whole, by *n*. Four of these propelling devices are shown in the drawing.

Valves *o* make it possible to separate some of the propelling devices *n* and to feed them with compressed air only under exceptional circumstances so that they exert in this case a booster action, with compressed fluid from an auxiliary source *p*. This last mentioned fluid may consist of compressed air, supplied from a tank in which it was previously stored.

It should be noted that the feed device *l* which supplies air to the propelling devices has its inlet turned frontwardly, so that its operation and its output can be improved when the vehicle is running in the direction shown by the arrow *Z* in Fig. 2, i. e. towards the right upon the drawing.

While I have, in the above description, disclosed what I deem to be practical and efficient embodiments of the present invention, it should be well understood that I do not wish to be limited thereto as there might be changes made in the arrangement, disposition, and form of the parts without departing from the principle of the present invention as comprehended within the scope of the appended claims.

What I claim is:

1. A vehicle propelling device which comprises, in combination, a motor, an air compressor operatively connected with said motor, a plurality of convergent-divergent nozzles adapted to be rigidly mounted with respect to said vehicle, with their convergent parts connected with the output of said compressor and their divergent parts opening in the direction in which the vehicle is to be propelled, and deflecting blades mounted ahead of the outlets of said nozzles, in fixed

position with respect thereto, respectively, said blades being concave in the rearward direction and having their inner or central portions located opposite the outlets of said nozzles and their outer or peripheral portions opening directly into the atmosphere, so as to reverse toward the rear the direction of flow of the gases issuing from said nozzles.

2. A vehicle propelling device which comprises, in combination, a motor, an air compressor operatively connected with said motor, a plurality of groups of convergent-divergent nozzles adapted to be rigidly mounted with respect to said vehicle, each group including at least two nozzles in series with each other, with their divergent parts extending in the direction in which the vehicle is to be propelled, and the convergent part of the rear nozzle of each group connected with said air compressor so as to be fed with compressed air from said compressor, and deflecting blades mounted ahead of the outlets of said nozzles, in fixed positions with respect thereto, respectively, said blades being concave in the rearward direction and having their inner or central portions located opposite the outlets of said nozzles and their outer or peripheral portions opening directly into the atmosphere, so as to reverse, toward the rear, the direction of flow of the gases issuing from said nozzles.

3. A vehicle propelling device which comprises, in combination, an internal combustion engine adapted to be mounted on the vehicle, an air compressor at the rear of said engine operatively connected therewith, a plurality of groups of convergent-divergent nozzles adapted to be rigidly mounted with respect to said vehicle, said groups being distributed on either side of the axis of said engine and symmetrically with respect to said axis, each group including at least two nozzles in series with each other, with their divergent parts extending in the direction in which the vehicle is to be propelled, and the con-

vergent part of the rear nozzle of each group being connected with the output of said air compressor so as to be fed with compressed air from said compressor, and deflecting blades mounted ahead of the outlets of said nozzles, in fixed positions with respect thereto, respectively, said blades being concave in the rearward direction and having their inner or central portions located opposite the outlets of said nozzles and their outer or peripheral portions opening directly into the atmosphere, so as to reverse, toward the rear, the direction of flow of the gases issuing through said nozzles.

4. A vehicle propelling device which comprises, in combination, an internal combustion engine adapted to be mounted on the vehicle, an air compressor at the rear of said engine operatively connected therewith, a rigid outlet tube for said compressor extending behind said engine at right angles to the direction in which said vehicle is to be propelled, a plurality of groups of convergent-divergent nozzles carried by said tube, said groups being distributed on either side of the axis of said engine and symmetrically with respect thereto, each group including at least two nozzles in series with each other, with their divergent parts extending in the direction in which the vehicle is to be propelled and the convergent part of the rear nozzle directly in communication with the inside of said tube, so as to be fed with compressed air from said compressor, and deflecting blades mounted ahead of the outlets of said nozzles, in fixed positions with respect thereto, respectively, said blades being concave in the rearward direction and having their inner, or central, portions located opposite the outlets of said nozzles, and their outer, or peripheral, portions opening directly into the atmosphere, so as to reverse, toward the rear, the direction of flow of the air streams issuing from said nozzles.

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