

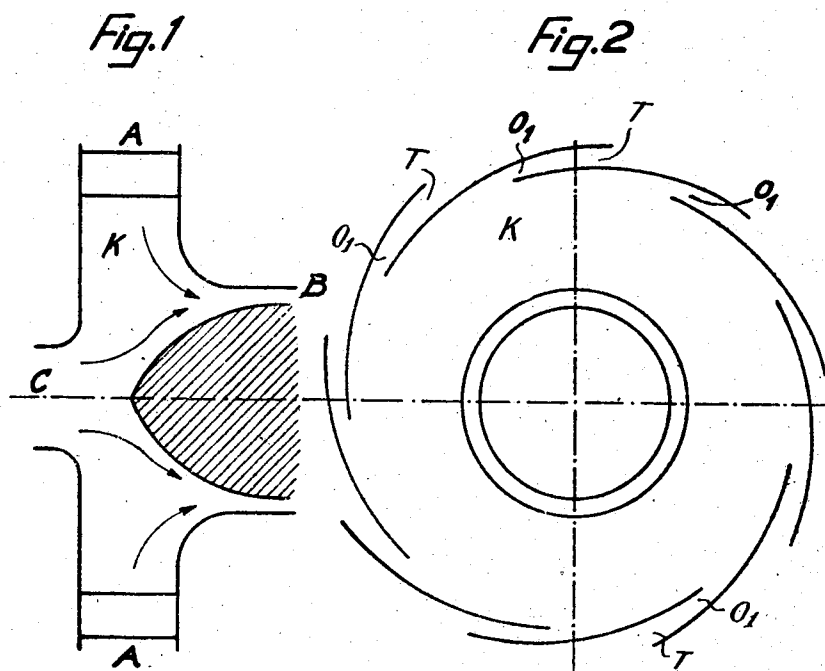
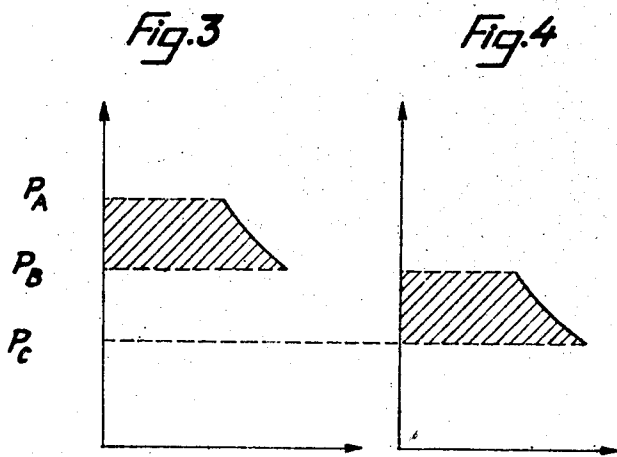
Aug. 28, 1951

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2,565,907

APPARATUS FOR TRANSFER OF FLUIDS

Filed Feb. 16, 1948



INVENTOR

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UNITED STATES PATENT OFFICE

2,565,907

APPARATUS FOR TRANSFER OF FLUIDS

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Application February 16, 1948, Serial No. 8,627
In France September 5, 1946

Section 1, Public Law 690, August 8, 1946
Patent expires September 5, 1966

1 Claim. (Cl. 230-95)

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This invention relates to an aerodynamic process for transferring fluids from a zone into another one wherein a higher pressure than in the first zone prevails.

According to this invention, for effecting such a transfer, use is made of the pressure distribution which is produced as a function of radius, by swirling axipetal flow of a primary fluid within a cylindrical chamber.

An apparatus adapted for carrying out this process may conveniently be used in any machine or plant wherein fluids are to be introduced into a chamber under a higher pressure, and it enables such an introduction to be effected without having resort to any rotary or reciprocating mechanical device.

It is possible in particular, although this example is not restrictive, to employ the process according to one invention for completing exhaust from internal combustion engine cylinders into an exhaust manifold where a pressure higher than inlet pressure prevails; which is particularly desirable where an exhaust gas turbine is provided since further expansion of gas is permissible.

Further advantages and features of our invention will become apparent from the following description thereof with reference to the appended drawing which shows diagrammatically and solely by way of example, form of construction of an aerodynamic ejector according to our invention.

Fig. 1 is a lengthwise section of said ejector.

Fig. 2 is an elevation of the revolution chamber.

Fig. 3 is a diagram illustrating how the pressure of the primary fluid employed as a prime mover for transfer varies, the specific volumes being plotted as abscissae, while pressures are plotted as ordinates.

Fig. 4 is a similar diagram showing how the pressure of the secondary fluid to be transferred varies.

Primary air is let into the periphery A of a cylindrical chamber K through apertures O₁ preceded by tangential nozzles T which taper into said chamber, converting the pressure of primary fluid into velocity.

Such primary air is discharged through an annular passage or outlet B after it has developed a strong swirling field in chamber K. Next to

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the axis of said chamber, a considerably lower pressure prevails than in passage B. A gas flow is thus set up from axial inlet C to annular passage B, and it proceeds as far as the pressure prevailing in the chamber (not shown) located upstream with respect to opening C and containing a fluid to be transferred to another chamber (not shown) located downstream with respect to passage B where a lighter pressure prevails, has dropped enough to assume a characteristic level which depends on the ratios between aperture radii:

$$\frac{R_A}{R_B} \text{ and } \frac{R_B}{R_C}$$

and on the rate of flow of primary air.

The pressure variation in the primary fluid flow from A to B is illustrated by the diagram of Fig. 3, while the pressure variation in the secondary or induced gas flow from C to B is shown on the diagram of Fig. 4.

We have thus actually provided a compressor borrowing energy from expansion to which primary fluid is subjected. Its efficiency is in some cases lower than that of a conventional mechanical compressor, but it meets a number of essential objects, particularly:

1. It comprises no moving mechanical member so that it is long lasting and quite simple in its construction.

2. It is very light.

3. It always operates under optimum conditions even where it is applied with flows varying at very high frequencies, having regard to the very small inertia of gas therein.

It should further be understood that our invention is not restricted to the form of construction above described, and many modifications relying on the same principle may be provided without departing from the scope of this invention.

What we claim is:

An apparatus for inducing a stream of secondary fluid by a stream of primary fluid, which comprises a hollow body containing a chamber which has approximately a shape of revolution, means providing an axial inlet for conveying axially into said chamber a stream of secondary fluid, means providing, opposite to said inlet, an annular outlet for a mixture of primary and sec-

ondary fluids, said outlet being coaxial with said inlet and having inner and outer diameters larger than that of said inlet, and a plurality of tangential inwardly convergent nozzles for directing said stream of primary fluid into said chamber, said nozzles being rigid with said body and distributed around the periphery of said chamber to define a ring coaxial with the inlet and outlet of said chamber and of larger diameter than the outer diameter of said annular outlet.

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REFERENCES CITED

The following references are of record in the file of this patent:

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