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DEVICE FOR DEFLECTING A STREAM OF ELASTIC
FLUID PROJECTED INTO AN ELASTIC FLUID
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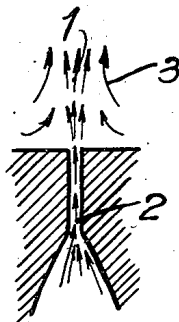


Fig. 1.

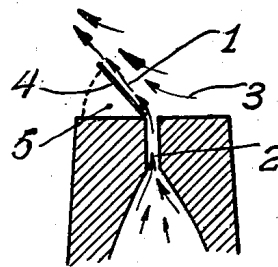
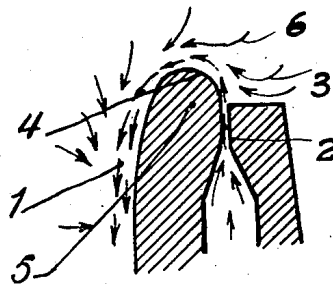


Fig. 2.

Fig. 3.



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DEVICE FOR DEFLECTING A STREAM OF
ELASTIC FLUID PROJECTED INTO AN
ELASTIC FLUID

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5 Claims. (Cl. 299—107)

It is an observed fact that when a stream or sheet of fluid issues through a suitable orifice, into another fluid, it will carry along with it a portion of the surrounding fluid, if its velocity is sufficient. In particular, if a sheet of gas at high velocity issues into an atmosphere of another gas of any kind, this will produce, at the point of discharge of the said sheet of gas, a suction effect, thus drawing forward the adjacent gas.

If, at the outlet of the fluid stream or sheet, there is set up an unbalancing effect on the flow of the surrounding fluid induced by said stream, the latter will move towards the side on which the flow of the surrounding fluid has been made more difficult.

It is thus evident that it will be possible, by a suitable checking of the surrounding fluid on one side of the orifice from which the fluid stream or sheet is discharged at high velocity, to act indirectly upon the direction of the issuing stream or sheet. In consequence, by the successive checking of the several layers of the fluid sheets on the proper side, if it is considered that the latter may be theoretically divided into layers to facilitate the demonstration, they may be made to follow any desired path.

Such is the object attained by the present invention, whose essential characteristic consists in the production of a determined unbalancing effect in the flow of the surrounding fluid induced by a sheet or stream of fluid which is discharged thereinto at high velocity.

For this purpose, the discharge orifices for the fluid each include, on the side toward which the said sheet or stream is to be deflected, guiding means, for instance a flap which is suitably inclined according to the rate of flow and the velocity of the fluid, and said flap may be more or less extended and may be more or less inclined, according to the path which the said stream is to be made to follow. On the other hand, by a proper knowledge of the physical constants of the surrounding fluid and of the fluid discharged into the same, it is possible to determine the optimum curve to be given to the means for guiding the stream, according to its rate of flow and velocity.

The invention further relates to the applications of the said process for the deflection of fluid streams which penetrate with a high velocity into another fluid. In particular, it relates to its application to the change of direction of the direct reactions due to the abrupt discharge of one fluid into another, which reactions are even greatly increased by the fact that on the

side which is not checked, the effect of suction is very greatly increased.

The accompanying diagrammatic drawing shows the direction of the streams of fluid which are discharged at high speed into another fluid through a nozzle, in the case of an equilibrium or a lack of equilibrium of the facilities of withdrawal of the surrounding fluid at the sides of the stream.

Fig. 1 shows the free discharge of a fluid stream 1, issuing from a nozzle, for instance, whose cross section has the form of a slot 2, also showing the induced flow of the surrounding fluid according to the arrows 3.

Fig. 2 shows the checking of the surrounding fluid on one side of the stream by means of a flap 4 which prevents the flow of the surrounding air from space 5, and also the deflection, according to the arrows 3, of the issuing stream discharged from the said nozzle.

Fig. 3 represents the flap 4 which is extended according to a given outline, thus producing a strong suction, at 6, of a stream which is entirely turned about, according to the arrows 7. This will eliminate the impact upon the surrounding fluid, which occurs in front of a sheet of fluid discharged at high velocity into another fluid.

I claim—

1. A device for controlling the discharge into an elastic fluid atmosphere of an elastic fluid moving at a high velocity, which comprises, a part provided with an outlet conduit, and means carried by said part, located wholly on only one side of the line of discharge of said conduit, for checking the flow of the elastic fluid of said atmosphere induced by the stream of elastic fluid issuing from said conduit.

2. A device for controlling the discharge into an elastic fluid atmosphere of an elastic fluid moving with a high velocity, which comprises, a part provided with an outlet conduit, and an element carried by said part projecting beyond the outlet of said conduit, located wholly on only one side of the line of discharge of said conduit, for checking, on this side, the flow of the elastic fluid of said atmosphere induced by the stream of elastic fluid issuing from said conduit.

3. A device according to claim 2 in which the outline of the projecting element is curved outwardly from the line of discharge of the conduit until it runs in a direction opposite to the direction of flow of the elastic fluid through said conduit, in order to cause the stream of said elastic fluid issuing from said conduit to flow along said outline and reverse its direction.

4. A structure for the discharge of an elastic fluid under pressure into the atmosphere which includes a part having a chamber formed therein for containing said elastic fluid under pressure, said part being provided with a slot-shaped pas-
5 sage connecting said chamber with the atmosphere, and a projection on the outer surface of said part extending along one edge of said slot and located wholly on one side of the line of dis-
10 charge of said slot.

5. A structure for the discharge of an elastic fluid under pressure into the atmosphere which includes a part having a chamber formed there-
in for containing said elastic fluid under pres-

sure, said part being provided with a slot-shaped passage connecting said chamber with the at-
mosphere, and a projection on the outer surface of said part running along one edge of said slot and located wholly on one side of the line of dis-
charge of said slot, said projection being tan-
5 gential to said edge of the slot and being curved outwardly from said line of discharge until it runs in a direction opposite to the direction of
flow of said elastic fluid through said passage, in order to cause the stream of elastic fluid issu-
10 ing from said passage to flow along said rounded or curved projection and reverse its direction.

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