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F. LÖSEL

WATER JET EJECTOR

Filed June 23, 1923

Fig. 1

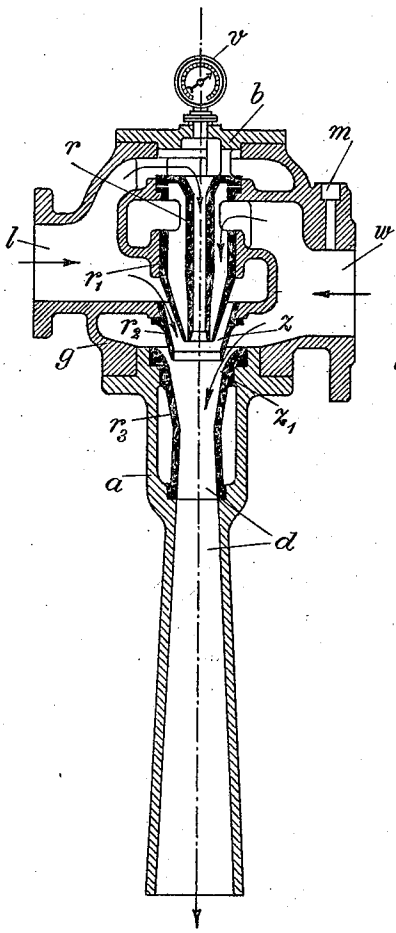
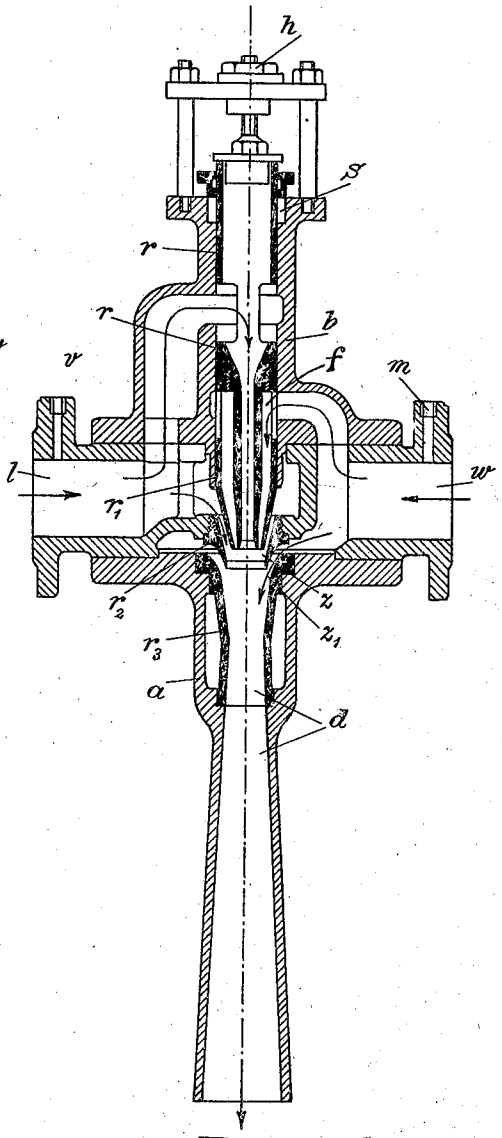


Fig. 2



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UNITED STATES PATENT OFFICE.

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WATER-JET EJECTOR.

Application filed June 28, 1923. Serial No. 648,387.

To all whom it may concern:

Be it known that I, FRANZ LÖSEL, a citizen of the Czechoslovakian Republic, residing at Brunn, Czechoslovakia, have invented certain new and useful Improvements in and Relating to Water-Jet Ejectors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to water jet ejectors having annular nozzles, in which the medium to be aspired is sucked by the inner and outer surface of a hollow jet of water, and has for its object considerably to improve the efficiency of the device, by the air or the like, which is to be aspired, coming into contact after leaving the nozzle openings only with the surfaces of operating jets and being conveyed along between such surfaces and compressed. For this purpose an outer annular nozzle for the working fluid, an annular nozzle for the air and another annular nozzle with a hollow core for the working fluid are arranged one within the other in the order given and in close proximity to each other in the direction of flow, so that the air or the like to be aspired is conveyed from where it leaves the nozzle orifices on the one hand between the outer surface of an inner hollow jet and the inner surface of an outer jet and on the other hand within the inner hollow jet without coming in contact with the walls of the casing.

In the accompanying drawings two constructional examples of the ejector according to the present invention are shown,

Figure 1 being a longitudinal section through a water jet ejector having fixed nozzles and

Figure 2 a similar section through a water jet ejector having adjustable nozzles.

In Fig. 1 g is the casing having inlet w for the water under pressure and inlet l for the medium to be aspired (air, condensate or the like). a is the delivery cone or casing and b a cover. In the casing g and in the delivery cone a there are provided for instance four annular nozzles r, r^1, r^2 and r^3, which by means of the annular passages z, z^1 produce two hollow jets, which impinge on each other in the diffuser d formed by the annular nozzle r^3 and the delivery cone a.

According to the invention the four outlet openings are located in close vicinity to each other in the direction of flow of the fluids, so that the jets lie one within the other over their entire length.

The hollow jet of water emerging from the annular passage z aspires the air with its inner and outer surface and the hollow jet of water formed by the passage z^1 only with its inner surface. The air aspired and caught in this way is carried along by the hollow jets of water, is preliminarily compressed by them and is further compressed by both kinds of jets in the diffuser d and ejected or further conveyed by the latter. v is the vacuum meter and m a branch for a pressure gauge.

In the constructional form of the invention shown in Fig. 2 the part r, r^1, which forms the inner hollow jet of water, is adjustable in the direction of flow by a nut h and is fitted with a gland s. The working fluid enters the part r^1 through apertures f, which are partially covered, when the part r^1 is adjusted. On the part r, r^1 being moved downwards from the position shown in Fig. 2, both the cross sectional areas of the annular air nozzle and, by the partial covering over of the apertures f, the cross-sectional area for the working fluid are reduced. Similarly the annular passage z can be adjusted by turning r in r^1.

The parts r^2 and r^3 can also be made adjustable similarly to the part r, r^1.

The invention has the following advantages, that the construction is very compact, with aspiring surfaces that are as large as possible, that the friction at the non-moving parts of the walls and the formation of eddies is reduced to a minimum, that the relative velocity between the jets is thoroughly utilized and that, owing to the possibility of compressing the inner hollow jet of water, the jets of working fluid become elastic, which results in the action of the diffuser being improved.

What I claim is:—

1. A water jet ejector comprising in combination an inner annular nozzle for conveying water, a hollow core within the said inner nozzle for conveying elastic fluid, an intermediate annular nozzle surrounding the said water conveying inner nozzle for conveying elastic fluid and an outer nozzle surrounding the intermediate elastic fluid conveying nozzle for conveying water, the orifices of the said nozzles lying in close proximity to

each other in the direction of flow, whereby the fluid jets issue from their nozzles at closely adjacent points and the elastic fluid after its issuance is prevented from coming in contact with the walls of the nozzle outlet and is compressed.

2. A water jet ejector, as claimed in claim 1, in which the inner nozzle for conveying water and the hollow core for conveying elastic fluid are axially adjustable, for the purpose set forth.

3. A water jet ejector comprising in combination an inner annular nozzle for conveying a hollow jet of water, a hollow core within the said inner nozzle for conveying elastic fluid, an intermediate annular nozzle surrounding the said water conveying inner nozzle for conveying elastic fluid and an outer nozzle surrounding the intermediate elastic fluid conveying nozzle for conveying water, whereby the elastic fluid is prevented from coming in contact with the walls of the nozzle outlet and is compressed between an outer incompressible annular jet of water and the inner elastic jet of water.

FRANZ LÖSEL.

Witnesses:
ANT. DEMARI,
PAUL SCHAUMSKY.