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JET ASSEMBLY FOR PUMPS

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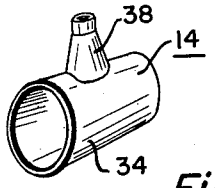


Fig. 4

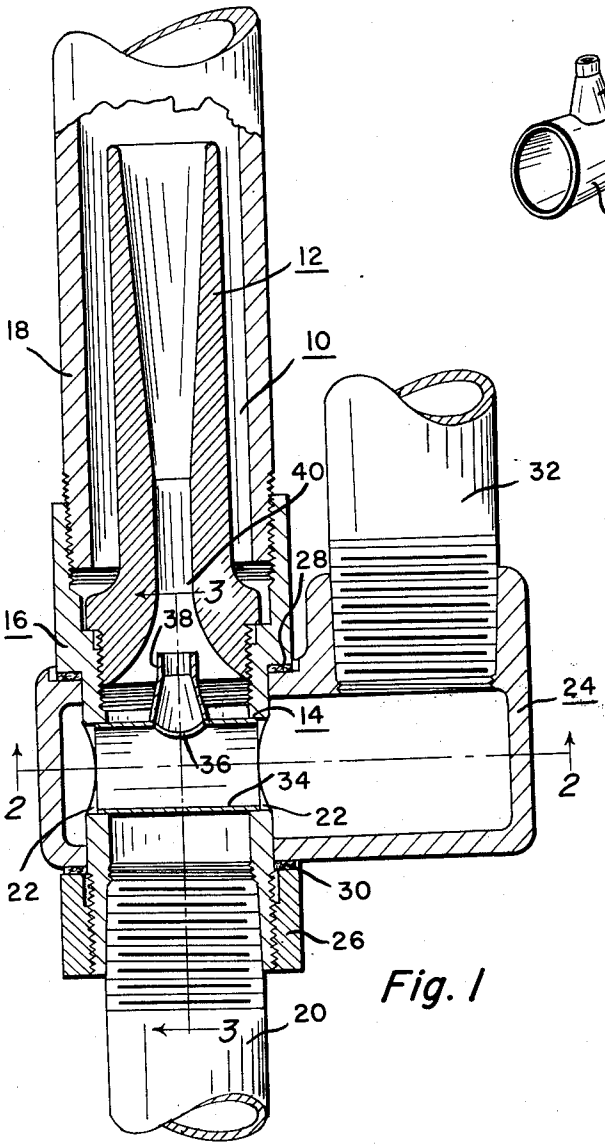


Fig. 1

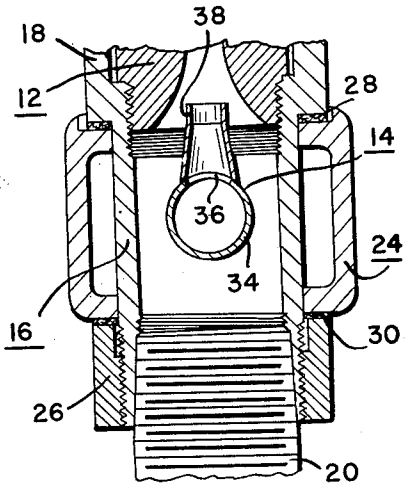


Fig. 3

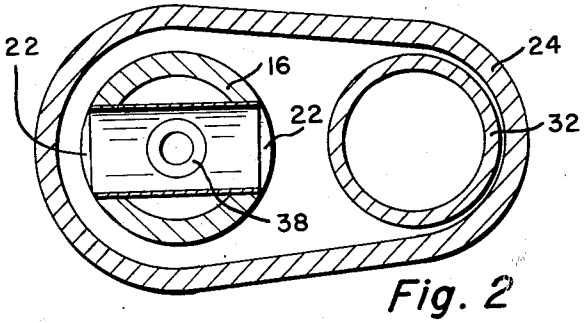


Fig. 2

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JET ASSEMBLY FOR PUMPS

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This invention pertains to a jet assembly for pumps, and particularly to a simplified jet nozzle construction.

Heretofore, jet assemblies for centrifugal jet pumps have been expensive to manufacture by reason of the fact that the jet assembly, comprising a nozzle and venturi, were made as either an integral casting having a plurality of cored passages or as individual castings which were later assembled. One of the salient features of this invention resides in a simplified and more economical nozzle construction for jet assemblies. Accordingly, among my objects are the provision of a simplified jet assembly for pumps, and the further provision of a jet nozzle assembly adapted for attachment to a coupling so that the nozzle terminates proximate the throat of a venturi.

The aforementioned and other objects are accomplished in the present invention by fabricating a two-piece nozzle assembly and thereafter, assembling the nozzle with a venturi so that the nozzle discharge opening is located proximate the throat of the venturi. Specifically, the nozzle comprises a tubular metal member having open ends and a sidewall opening, and a hollow substantially frusto conical metal member attached thereto adjacent the edges of the sidewall opening. The jet assembly may be used with either a double type arrangement, as disclosed herein, or with a single type arrangement. In either event, the venturi comprises a metal or plastic casting which is threadedly connected with a coupling, the coupling also being threadedly connected at opposite ends to a venturi intake pipe and a venturi discharge pipe. The coupling has a transverse or diametrically extending opening therethrough within which the tubular member of the nozzle is disposed. The nozzle is oriented within the coupling so that the sidewall opening in the tubular member and the conical member are coaxially arranged with respect to the venturi.

The jet assembly operates in a conventional manner when associated with a centrifugal pump. Thus, a portion of the fluid is diverted from the pump outlet and discharged through the nozzle into the throat of the venturi. The high velocity of the fluid traversing the throat of the venturi creates suction, which draws additional fluid from a sump, or well, through the venturi intake pipe. In this manner, fluid is drawn from the sump, or well, which fluid traverses the venturi and flows to the pump through the venturi discharge pipe.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of the present invention is clearly shown.

In the drawing:

Fig. 1 is a view, partly in section and partly in elevation, of the jet assembly of this invention.

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken along line 3—3 of Fig. 1.

Fig. 4 is a view, in perspective, of the jet nozzle assembly of this invention.

With particular reference to Figs. 1 through 3, the jet assembly of this invention is depicted generally by the numeral **10**, and comprises a venturi **12** and a jet nozzle assembly **14**. The venturi is threadedly connected with a coupling **16**, the coupling **16** also having threaded connection at opposite ends with a venturi discharge pipe **18** and a venturi intake pipe **20**. The coupling member **16** is formed with a transverse, or diametrical, opening **22**, which, as disclosed, is enclosed by an adapter **24**. The adapter **24** encompasses the section of the coupling **16** having the transverse opening **22**, and is retained in position by a nut **26**, which threadedly engages an exterior portion of the coupling **16**. Suitable gaskets **28** and **30** are employed to prevent leakage of fluid from within the adapter.

The adapter is also connected with a pipe **32** through which a portion of the pump output with which the jet assembly is associated, is diverted. The arrangement depicted in Fig. 1 is known as a two-pipe jet assembly, but it is to be understood that the jet nozzle construction of this invention can also be used with a single pipe arrangement. Moreover, it is to be understood that the pipe **18** will be connected with the intake of a pump, not shown; the pipe **20** will be connected to a sump, or a well, not shown; while the pipe **32** will be connected to one of the pump outlets so that a portion of the pump output is diverted through the jet assembly for drawing fluid from the well through the pipe **20**.

With particular reference to Fig. 4, the improved jet nozzle construction of this invention comprises a cylindrical member **34**, which may be of sheet metal, having a sidewall opening **36**, as shown in Figs. 1 and 3. The jet nozzle construction also includes a substantially frusto conical metal member **38**, which may also be of sheet metal, adapted to be suitably secured to the member **34** adjacent the peripheral edges of the sidewall opening **36** by any suitable means, such as by welding.

The jet assembly is made as follows. Initially, the tubular member **34** is inserted in the transverse opening **22** of the coupling **16**, after which it is secured in place by any suitable means, such as by welding. Thereafter, the nozzle element **38** is connected to the peripheral edges of the sidewall opening **36** so that the outlet thereof is coaxially arranged within the coupling **16**. Thereafter, the venturi **12** is threadedly connected with the coupling **16**, after which the adapter **24** and the pipes **18**, **20** and **32** may be assembled with the jet assembly.

In operation, water is diverted from the pump outlet, not shown, through the pipe **32** to the adapter **24** from which it passes through the tubular member **34** and discharges through the nozzle element **38** proximate the throat **40** of the venturi **12**. The discharge of fluid under high velocity into the throat **40** of the venturi, creates a suction effect, which draws fluid from the sump, or well, not shown, through the intake pipe **20**, the coupling **16**, and discharges the same through the venturi **12** to the pipe **18** from which it is drawn to the pump intake.

From the aforegoing, it is apparent that the present invention provides an exceedingly simplified jet construction which is economical to manufacture and assemble with a venturi.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. A jet assembly including, a coupling adapted for connection to a venturi intake pipe and a venturi discharge pipe, a venturi attached to and coaxially disposed within said coupling, said coupling having a transverse

opening therethrough, a nozzle assembly supported by said coupling and coaxially arranged with respect to said venturi, said nozzle assembly comprising a tubular member supported in the transverse opening of said coupling and having a sidewall opening, and a second member having a substantially frusto conical passage therethrough communicating with the sidewall opening of said tubular member, the outlet of said second member terminating proximate the throat of said venturi, and a hollow adapter attached to said coupling, said adapter encompassing said coupling and communicating with said tubular member.

2. A jet assembly including in combination, a hollow coupling adapted for connection to a venturi intake pipe and a venturi discharge pipe, a venturi attached to and coaxially disposed within said coupling, said coupling having a transverse opening therethrough, a jet nozzle assembly supported by said coupling comprising, a first hollow member disposed in the transverse opening and having a sidewall opening, and a second member attached to said first member and having a substantially frusto conical passage therethrough communicating with the side wall opening of said tubular member, said second member terminating proximate the throat of said venturi, and a hollow adapter attached to said coupling and enclosing the transverse opening therein.

3. A jet assembly including in combination, a hollow coupling adapted for connection to a venturi intake pipe and a venturi discharge pipe, a venturi attached to and coaxially disposed within said coupling, said coupling having a transverse opening therethrough, a jet nozzle assembly supported by said coupling comprising, a hollow cylindrical member supported in the transverse opening of said coupling and having a sidewall opening, and a second member attached to said cylindrical member adjacent the peripheral edges of said sidewall opening and having a substantially frusto conical passage therethrough, the end of said second member terminating proximate the throat of said venturi, a hollow adapter attached to said coupling, said adapter encompassing said coupling and communicating with said hollow cylindrical

member, and a pressure pipe connected to said hollow adapter.

4. A jet assembly including in combination, a hollow coupling adapted for connection to a venturi intake pipe and a venturi discharge pipe, a venturi attached to and coaxially disposed within said coupling, said coupling having a transverse opening therethrough, a jet nozzle assembly supported by said coupling comprising, a tubular metal member having a sidewall opening, the ends of said metal member being received in and supported by the transverse opening in said coupling, and a hollow, substantially frusto conical metal member attached to said cylindrical member adjacent the peripheral edges of said sidewall opening, said frusto conical member terminating proximate the throat of said venturi and a hollow adapter attached to said coupling and enclosing the transverse opening therein.

5. A jet assembly including in combination, a coupling having a diametrical opening therethrough, a hollow adapter attached to said coupling so as to enclose said diametrical opening, a venturi coaxially supported within said coupling, and a nozzle assembly coaxially supported within said coupling comprising a hollow member having ends received by the diametrical opening in said coupling, said hollow member having a sidewall opening, and a nozzle-like element attached to the hollow member adjacent the peripheral edges of said sidewall opening and having an outlet terminating proximate the throat of said venturi.

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