T. E. JONES.

PUMPING DEVICE.

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1,158,690. Patented Nov. 2, 1915.

Fig. 1

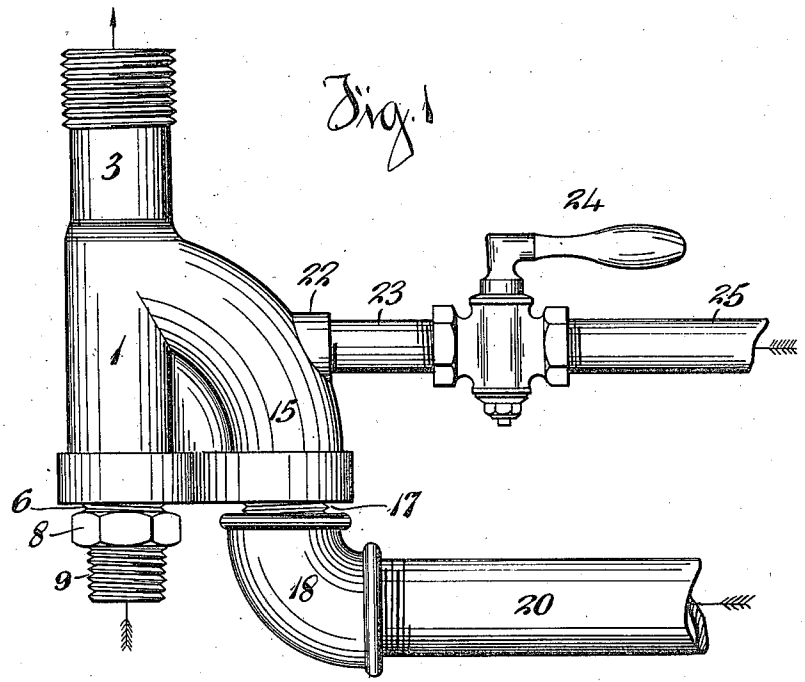
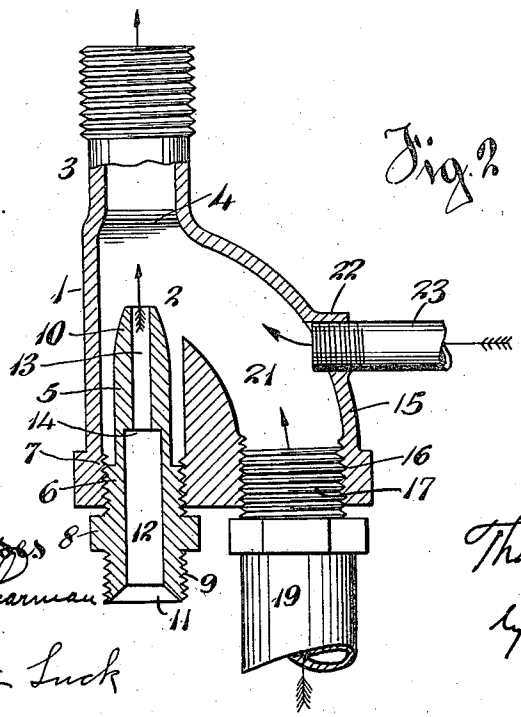


Fig. 2



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UNITED STATES PATENT OFFICE.

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PUMPING DEVICE.

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To all whom it may concern:

Be it known that I, THOMAS E. JONES, a citizen of the United States of America, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Pumping Devices, of which the following is a specification.

This invention relates to pumping devices of the ejector type and, more particularly, to an improvement in the special type of ejector pumping apparatus patented by me Dec. 13, 1898, No. 615,992.

The object of the invention herein is to simplify the said former patented device, to reduce its cost of manufacture and repair and to render it more efficient for the required service that combines the lifting of water and other fluids from a vertical as well as horizontal intake, as well as to further force or eject the water beyond the mere lifting stage but not against pressure such as is present in connection with an injector device.

The constructive features of the present invention will be minutely described hereinafter and particularly pointed out in the claims.

In the accompanying sheet of drawings, Figure 1 is an elevation showing my improved ejector device with a horizontal intake and, also, with an auxiliary cold water service attachment that adapts it to the pumping of water or other fluids of a higher temperature than that possible with my previously patented device, and Fig. 2 is a central vertical section, partly in elevation, showing my device with a vertical intake, but with the controlling valve of the auxiliary hydrant attachment omitted.

1 indicates the body portion or main shell containing the vacuum-chamber 2 and extending upwardly into an outlet or discharge end 3, the latter having a slightly contracted throat 4, all as best seen in Fig. 2.

5 indicates a steam inlet-nozzle having a screw-threaded portion 6 that engages a threaded opening 7 in the body portion 1 and centrally alining with the outlet 3. An angular-formation 8 is provided on the outer portion of the steam-nozzle for use in turning it to and from operating position and, also, in properly adjusting said nozzle for the best suited delivery of the steam-jet in the vacuum chamber 2. The extreme outer end of the nozzle is threaded, as shown at 9, for the desired engagement of the steam supply-pipe that is not shown herein. The nozzle has a tapered inner end 10 and an inwardly-beveled mouth or inlet-opening 11, and its internal bore has a wide passage 12 that terminates in a narrow passage 13, a shoulder 14 intervening, whereby the volume of steam is somewhat compressed in its passage through the nozzle.

A vertical Y-branch 15 extends laterally and downwardly from the body portion or shell 1 and is intended for the upward passage of water or other fluid that is to be lifted from below. This Y-branch has an internal screw-thread 16 in its lower end or mouth for the engagement of an externally threaded coupling-pipe 17, to which latter an elbow 18 is attached in Fig. 1, and a vertical pipe 19 in Fig. 2, said elbow 18 having a horizontal pipe 20 engaged with its outer end for a horizontal passage of the water from below, and the pipe 19, of Fig. 2, forming a vertical intake from below. It will be observed that the ejector portion of my device herein remains unchanged for both the horizontal and vertical intakes, which forms an important feature of the invention herein and is of great advantage to users of this class of pumping devices.

In the operation of the device it will be observed that the upward passage of the water from the intake into the curved branch 21 is not impeded by any material obstruction and is smoothly guided into the vacuum-chamber that is occupied by the tapered point 10 of the steam-nozzle, the jet of steam that projects into the throat 4 of the discharge-orifice 3 effectually providing the necessary vacuum into and beyond which the water rushes for its upward lift, either for an ordinary flow or discharge above, or for an extended pressure or force beyond, as desired. The extended pressure or force of the water beyond the ordinary lifting and flowing stage is accomplished by means of an increased pressure of steam beyond that which is necessary to simply lift the fluid. Besides, the discharge-passage is not a small one, although somewhat smaller than that of the curved passage 21, the latter leading from the intake-coupling 17 and, also, somewhat larger than the bore of said intake-coupling 17.

While the device is capable of pumping cold and hot fluids alike, its capacity to pump fluids of a very high temperature is

augmented by means of the auxiliary hydrant pressure or service device that is attached to the inlet 22 made in the Y-branch 15 of the shell and is composed of a short length of pipe 23, a controlling-valve 24 and the service-pipe proper 25 that leads from any suitable cold water supply. The inner end of the pipe 23 terminates in the passage 21 and discharges the cold fluid into the shell at a point that is anterior to that of the vacuum and just in advance or ahead of the hot water, whereby the hot water emanating from the screw-coupling 17 of the intake is at once intermingled with the cold water and so reduced in temperature as to be ready for immediate advance into the vacuum-chamber 2 and thence projected beyond into the discharge-orifice without choking or clogging the vacuum-chamber. This cold water auxiliary or adjunct is an important feature of the invention herein because it adds materially to the use and capacity of the former device in which the pumping of fluids of as high temperatures could not be reached. Water at as high a temperature as 170 degrees can thus be cooled right at the vacuum-chamber sufficient to properly pass into the vacuum-chamber and thence into the discharge-orifice, without the entrance of the latter being choked or clogged by any accumulation therein. Hose can be attached to the screw-threaded exit-end of the discharge-orifice for use in throwing water for fire, cleaning, flushing, or other similar service.

In using the device in connection with a horizontal intake it is obvious that it will not require the same amount of lifting power or pressure that it will in connection with the use of a vertical intake and, in such event, the use of a horizontal intake is adapted to water as well as steam power or pressure in the power nozzle for effecting the required vacuum for both lifting and forcing any water or fluids that enter said horizontal intake. This is an important feature in connection with the adaptability of the invention herein, to either a horizontal or vertical intake, but necessitating the use of the steam pressure in connection with the vertical intake unless an abnormal pressure of water can be supplied to the power nozzle.

I claim:—

1. An ejector device comprising a shell having an outlet or discharge orifice, a steam-nozzle mounted in said shell in axial alinement with said discharge-orifice, a downwardly-curved Y-branch leading from said shell at a point coincident with the extreme exit end of said steam-nozzle, and an intake leading from either a horizontal or a vertical source of fluid-supply into a curved passageway in said Y-branch that discharges said fluid-supply into the vacuum-chamber at the point of said exit end of the steam-nozzle and from whence said fluid-supply is carried by the jet of steam into said discharge-orifice for lifting and forcing beyond.

2. An ejector pumping device comprising a vertical body portion or shell having a contracted discharge-orifice, a steam-nozzle adjustably and detachably mounted in the lower end of said shell in axial alinement with said discharge-orifice, a downwardly turned and curved Y-branch leading from said shell at a point axially coincident with the point or extreme exit end of said steam-nozzle, an intake coupling in the inlet end or mouth of said Y-branch adapted to receive the connecting end of either a vertical or a horizontal intake, and a valve controlled cold fluid supply-pipe leading under hydrant pressure into said Y-branch at a point that precedes that of the vacuum in the shell.

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