W. A. ASHCRAFT

INJECTOR.

No. 192,213. Patented June 19, 1877.

Fig. 1

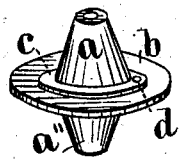
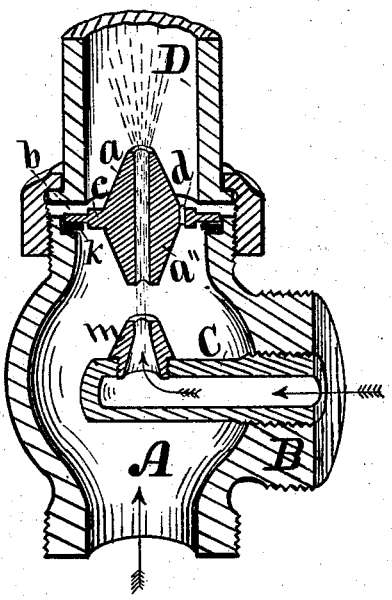


Fig. 2



Witnesses:

W. H. Shaw

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UNITED STATES PATENT OFFICE.

WILLIAM A. ASHCRAFT, OF DES MOINES, IOWA.

IMPROVEMENT IN INJECTORS.

Specification forming part of Letters Patent No. **192,213**, dated June 19, 1877; application filed March 14, 1876.

To all whom it may concern:

Be it known that I, WILLIAM A. ASHCRAFT, of Des Moines, in the county of Polk and State of Iowa, have invented an Improved Steam-Pump, of which the following is a specification:

The object of my invention is to improve the construction, efficiency, and durability of a steam-injector pump.

It consists, first, in the form of a reversible combining-tube; second, in the manner of adjusting and combining the combining-tube with a steam-jet; all as hereinafter fully set forth.

Figure 1 of my drawing is a perspective view, illustrating the construction of my reversible combining-tube.

a is a conical tube. *b* is a disk or flange at the base of the tube. *c* is a shoulder and enlargement of the disk or flange *b*. *d* is a vertical vent or perforation through the disk *b c* at the base of the conical tube *a*, to allow water to drain off from above the flange *b*, and thereby prevent it from freezing when the pump is not in operation and the temperature is cold. *a''* is a counterpart of the top tube *a*, on the under side of the disk *b c*.

The complete valve is one solid casting, having a continuous bore or perforation through the conical tubes *a a''*, and also a vent or perforation, *d*, through the disk *b c*.

The upper and under sides of the combining-tube are exactly alike in all respects, so that when one side gets worn out the combining-tube can be reversed, and used until both sides are too much worn to operate.

Fig. 2 is a perspective view of a half-section of a T-form tube-joint, carrying a steam-jet, and illustrates the manner of applying and operating my reversible and adjustable combining-tube.

A represents the T-joint, designed to be connected with a well-tube, and the water that is to be lifted. B is the branch, connected with the steam-chamber of an engine. C is a steam-jet, fixed in the branch B.

D represents the conducting-tube, connected with the top branch of the T-joint A. *a b c d* is my reversible combining-tube, resting on a shoulder, *g*, in the top branch of the T-form joint.

k is an annular plate or washer, conforming in size and shape with the flange *b* of the combining-tube and the shoulder *g* in the upper branch of the T-form joint A. This plate *k* is placed under the flange of the combining-tube to raise the position of the combining-tube relative to the fixed nozzle *m* of the steam-jet C, and to thereby increase the vacuum and the volume of the column of water elevated and discharged.

By removing the plate *k* the combining-tube is lowered and the vacuum-chamber diminished, and the volume of water diminished and discharged with greater force. When the plate is removed from below the combining-tube it must be placed on the top side of the combining-tube to hold the combining-tube secure.

By means of the washer *k*, or a graduated series of such washers, the combining-tube can be readily adjusted to elevate and discharge a large volume of water, or to force and throw a diminished volume and column, jet, or spray.

I claim as my invention—

1. In a steam-injector pump, the reversible combining-tube *a a'' b c d*, substantially as and for the purposes shown and described.

2. The combining-tube *a a'' b c d*, in combination with the washer *k* and the fixed steam-nozzle *m*, substantially as and for the purposes specified.

WILLIAM A. ASHCRAFT.

Witnesses:

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