W. E. WOLLHEIM.

JET PUMP APPARATUS.

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1,111,343.

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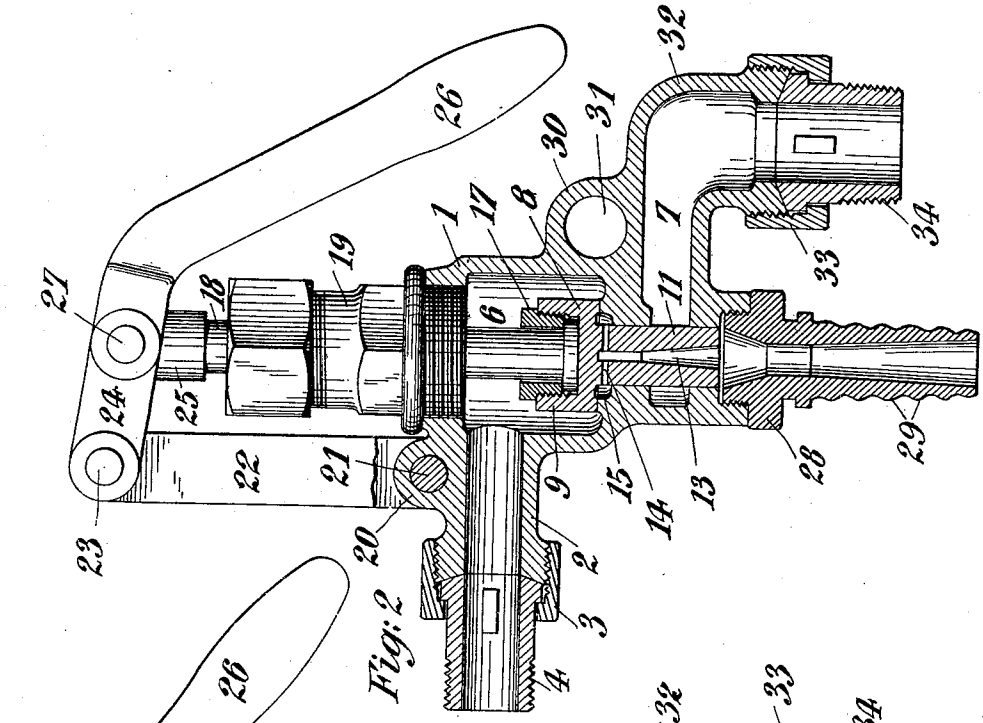


Fig. 2

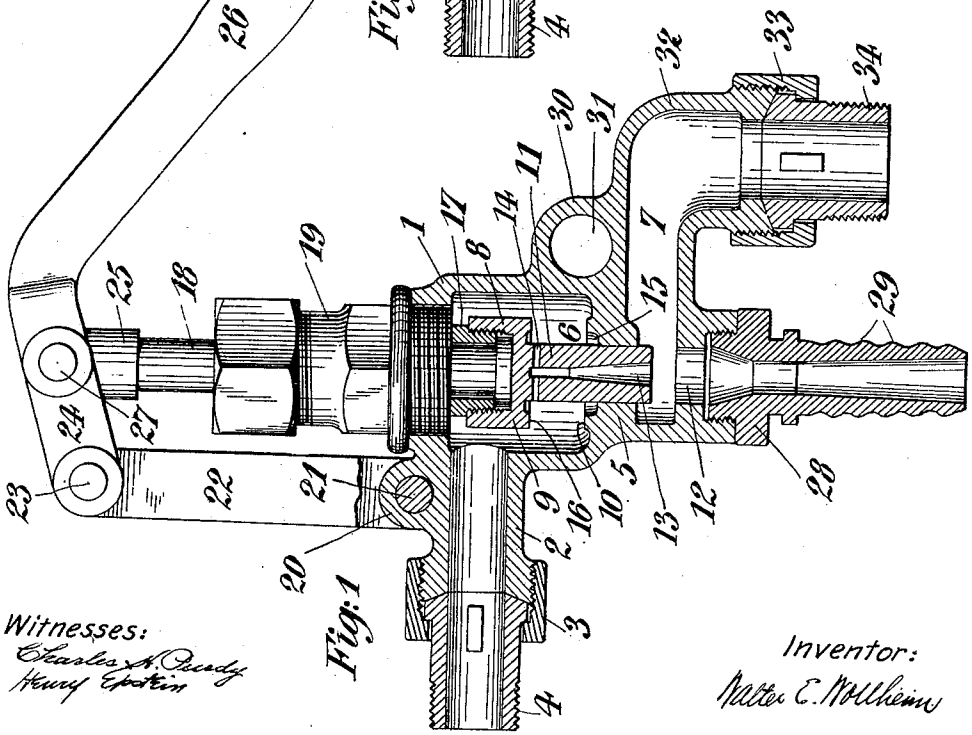


Fig. 1

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UNITED STATES PATENT OFFICE.

WALTER E. WOLLHEIM, OF NEW YORK, N. Y., ASSIGNOR TO THE NATHAN MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

JET-PUMP APPARATUS.

1,111,343. Specification of Letters Patent. Patented Sept. 22, 1914.

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To all whom it may concern:

Be it known that I, WALTER E. WOLLHEIM, a citizen of the United States, residing at New York, in the county of the Bronx and State of New York, have invented certain new and useful Improvements in Jet-Pump Apparatus, of which the following is a specification.

This invention relates to jet pump apparatus and particularly to that class used for wetting the coal in the tender of a locomotive or similar purposes and it is the particular object of my invention to so construct such apparatus as to necessitate a single valve to be employed only in operating the instrument, this valve performing the function of a steam control and also water check as will hereinafter be set forth more fully in detail.

Various other objects will appear in the following specification in which a preferred form of my jet pump apparatus is disclosed.

In the accompanying drawings which illustrate my invention Figure 1 shows a central longitudinal section, part of the operating valve being shown in elevation and the apparatus in the working position. Fig. 2 shows a similar section, the apparatus, however, being shown at rest.

Like characters of reference indicate corresponding parts.

1 is a main casing having on one side thereof, near the top, a branch 2, externally screw threaded to receive a coupling nut 3 and sleeve 4 for connection with a steam pipe. The interior of casing 1 is divided into two parts by a bridge 5 separating a steam chamber 6 and a water chamber 7.

8 is a steam nozzle of circular shape, its larger top portion 9 adapted to seat itself on a corresponding raised part 10 of bridge 5. Lower end 11 of steam nozzle 8 is of smaller cylindrical shape, adapted to frictionally engage with a corresponding bore through bridge 5 and also with another bore 12 through the lower wall of water chamber 7. Interior of steam nozzle 8 is provided with an outwardly diverging tapered bore 13 and ports 14 affording means of communication between tapered bore 13 and an annular recess 15 below the seat portion 16 of the steam nozzle 8. The upper end of steam nozzle 8 is bored out internally to receive a lock nut 17, adapted to connect a stem 18 to the nozzle. Stem 18 passes through a stuffing box 19, screwed into the upper part of casing 1. On the top of branch 2 is arranged a thickened portion 20, provided with a bore to receive a pin 21. A fulcrum bar 22 is connected to the casing by means of pin 21 and by means of a similar pin 23 to the end of an operating lever 24. To upper end of stem 18 is attached a link 25 to which is connected the operating lever 24 at a point intermediate its end and operating handle 26 by means of a suitable pin 27. Into the lower end of casing 1 and in alinement with the steam nozzle 8 is screwed a delivery nozzle 28. The exterior of delivery nozzle 28 is provided with corrugations 29 to facilitate the attaching of a sprinkling hose thereto. In the upper wall of water chamber 7, adjacent to steam chamber 6, is arranged a thickened portion 30 provided with a hole 31 adapted to receive a bolt or similar means to secure the instrument to a suitable brace. One side of the water chamber 7 terminates in an elbow branch 32 which is threaded externally adapted to receive a coupling nut 33 and pipe sleeve 34 for connection to the water supply pipe.

The apparatus, when to be used for coal sprinkling or similar purposes, is usually mounted to the backhead of the boiler by means of a bolt passing through hole 31. The steam pipe is connected directly to the boiler, and the water pipe generally to the water supply pipe of the injector.

The operation of my device is as follows: As soon as the steam nozzle 8 is pulled off its seat and to the position shown in Fig. 1, steam is admitted through ports 14 into the interior of steam nozzle 8, whence it passes through opening 12 and the delivery nozzle 28. This creates a vacuum in the water chamber 7 which together with the atmospheric pressure on the water in the water tank forces the water into the chamber 7, whence it is drawn into the delivery nozzle and discharged from the apparatus. The lower portion 11 of steam nozzle 8 having a sliding piston fit with bridge 5 it can readily be seen that steam cannot pass around the exterior of the steam nozzle, but must pass to the interior of this nozzle through ports 14. Annular recess 15 on top of the bridge 5, surrounded by the raised portion 10 forming the seat for the steam nozzle 8, is to provide space for accumulation of impurities, as in-

variably takes place in instruments of this character. The registering of ports 14 with this annular recess 15, when in closed position, as shown in Fig. 2 afford means for exhausting this recess when closing the steam nozzle.

As the apparatus in many cases can more conveniently be placed below the highest level of the water in the tender or other source of water supply, it is of utmost importance that the instrument be provided with means which effectively prevent the waste of water at the discharge end. This is accomplished as clearly illustrated in Fig. 2, which shows the apparatus at rest, by the lower end of steam nozzle 8 frictionally engaging the sides of bore 12 through the lower wall of water chamber 7, thereby sealing the outlet of the water chamber. This also prevents the blowing out of steam through the discharge nozzle 28, should the injector be used as a heater and steam blown through the water supply pipe of the injector to the tender.

What I claim as new is:

1. In a jet pump apparatus having a steam chamber and a water chamber and respective supply connections thereto, a steam nozzle adapted to control the admission of steam to its interior, and means in combination and concentric with said steam nozzle for sealing the outlet of said water chamber, when said apparatus is at rest.

2. In a jet pump apparatus having a steam chamber and a water chamber and respective supply connections thereto, an actuating device adapted to reciprocate a steam nozzle in line of its longitudinal axis, said steam nozzle being adapted to control the admission of steam to its interior, and means in combination with said steam nozzle for sealing the outlet of said water chamber, when the apparatus is at rest.

3. In a jet pump apparatus having a steam chamber and a water chamber and respective supply connections thereto, a steam nozzle adapted to be reciprocated in line of its longitudinal axis and to control the admission of steam to its interior, and means integral with said steam nozzle adapted to seal the outlet of said water chamber, when the apparatus is at rest.

4. In a jet pump apparatus having a steam chamber and a water chamber and respective supply connections thereto, an actuating device adapted to reciprocate a steam nozzle in line of its longitudinal axis, said steam nozzle being adapted to control the admission of steam to its interior and its lower end being piston shaped and adapted to close two coaxial bores in opposite walls of said water chamber and in alinement with a discharge nozzle, when the apparatus is at rest.

5. In a jet pump apparatus having a steam chamber and a water chamber and respective supply connections thereto, an actuating device adapted to reciprocate a steam nozzle in line of its longitudinal axis, said steam nozzle comprising a larger upper and a smaller lower portion, its larger upper portion being adapted to control the admission of steam to the interior of said steam nozzle and its smaller lower portion being arranged to seal the outlet of said water chamber when the apparatus is at rest.

6. In a jet pump apparatus having a steam chamber and a water chamber and respective supply connections thereto, an actuating device adapted to reciprocate a steam nozzle in line of its longitudinal axis, said steam nozzle comprising a larger upper and a smaller lower portion, its larger upper portion forming a steamtight seat on a bridge separating said steam and water chambers and its smaller lower portion being piston shaped and adapted to seal the outlet of said water chamber when the apparatus is at rest.

7. In a jet pump apparatus having a steam chamber and a water chamber and respective supply connections thereto, an actuating device adapted to reciprocate a steam nozzle in line of its longitudinal axis, said steam nozzle comprising a larger upper and a smaller lower portion, its larger upper portion forming a steamtight seat on a bridge separating said steam and water chambers and its smaller lower portion being provided with an interior outwardly diverging bore and ports through the upper part and the interior bore of said smaller lower portion, said smaller lower portion being piston shaped and adapted to seal the outlet of said water chamber when the apparatus is at rest.

8. In a jet pump apparatus having a steam chamber and a water chamber and respective supply connections thereto, an actuating device adapted to reciprocate a steam nozzle in line of its longitudinal axis, said steam nozzle comprising a larger upper and smaller lower portion, its larger upper portion being adapted to form a steamtight seat on a bridge separating said steam and water chambers and its smaller lower portion being provided with an interior outwardly diverging bore and ports through the upper part and the interior bore of said smaller lower portion, said smaller lower portion being piston shaped and adapted to close two coaxial bores in opposite walls of said water chamber and in alinement with a discharge nozzle, when the apparatus is at rest.

9. In a jet pump apparatus having a steam chamber and a water chamber and respective supply connections thereto, an actuating device adapted to reciprocate a steam nozzle in line of its longitudinal axis,

said steam nozzle comprising a larger upper and a smaller lower portion, its larger upper portion being adapted to form a steamtight seat on a bridge separating said steam and water chambers and its smaller lower portion being provided with an interior outwardly diverging bore and ports through the upper part and the interior bore of said smaller lower portion, said ports being in register with an annular recess in said bridge, below and inside of the seat portion of said steam nozzle, said smaller lower portion being adapted to seal the outlet of said water chamber when the apparatus is at rest.

10. In a jet pump apparatus having a steam chamber and a water chamber and respective supply connections thereto, an actuating device adapted to reciprocate a steam nozzle in line of its longitudinal axis, said steam nozzle comprising a larger upper and a smaller lower portion, its larger upper portion being adapted to form a steamtight seat on a bridge separating said steam and water chambers, an annular recess in said bridge, below and inside of the seat portion of said steam nozzle, ports through said smaller lower portion of the steam nozzle in register with said annular recess passing crosswise through the upper part of said smaller lower portion of the steam nozzle and connecting with an outwardly diverging bore through the interior of said lower portion of the steam nozzle, the exterior of said lower portion being piston shaped and adapted to frictionally and slidably engage a bore through said bridge, below said annular recess, and to close another bore in the lower wall of the water chamber and in alinement with a discharge nozzle, when the apparatus is at rest.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WALTER E. WOLLHEIM.

Witnesses:
LEOPOLD KASSANDER,
CHARLES A. SCHWARZ.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."