J. W. SNIDER.

WATER HEATING DEVICE.

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1,176,612. Patented Mar. 21, 1916.

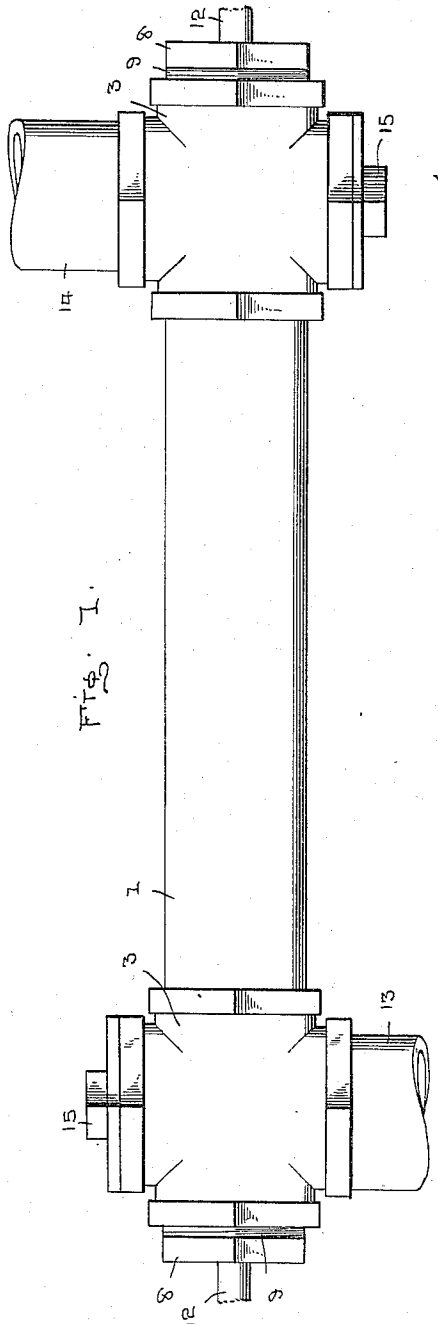


Fig. 1.

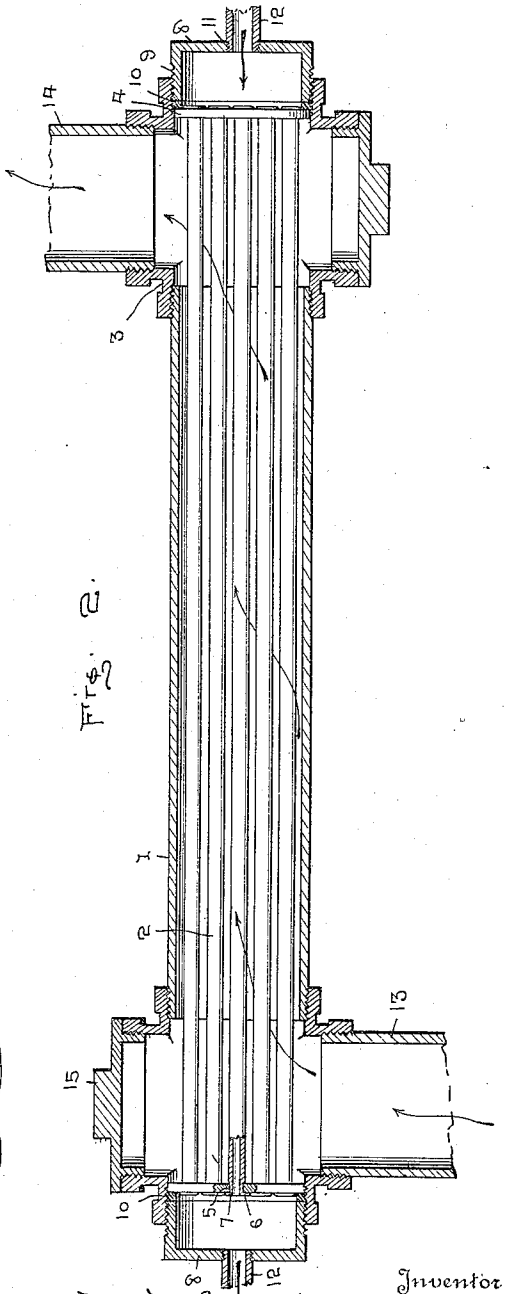


Fig. 2.

Witnesses

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JOHN W. SNIDER, OF DENTON, NORTH CAROLINA.

WATER-HEATING DEVICE.

1,176,612. Specification of Letters Patent. Patented Mar. 21, 1916.

Application filed June 24, 1914. Serial No. 846,960.

To all whom it may concern:

Be it known that I, JOHN W. SNIDER, a citizen of the United States, residing at Denton, in the county of Davidson and State of North Carolina, have invented certain new and useful Improvements in Water-Heating Devices; 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.

My invention relates to water heating devices and in particular to water heating devices attached to boilers.

The main object of my invention is to heat the water by exhaust steam previous to its injection into a boiler, so that said water can be more quickly converted into steam in said boiler, than otherwise would be the case, thereby saving fuel.

Another object of my invention is to provide a water heating device that can be easily cleaned or demounted.

Still another object of my invention is to provide a device that is very simple in construction, yet very efficient and durable.

A preferred embodiment is shown in the drawings, but I desire to be limited only by the scope of the claim appended hereto.

Similar characters of reference refer to similar parts throughout the drawings, in which,—

Figure 1, is an elevational view of my device in assembled position. Fig. 2, is a vertical section therethrough.

My device is intended to be mounted in the water supply to the boiler, between the pump or source of water supply, and the boiler.

In the figures of the drawings, 1 is my shell or tubing inclosing a plurality of small water pipes 2, each end of my shell 1 is threaded and has threaded thereupon one of the threaded openings of a cross-joint 3. Mounted in the opposite threaded opening of each of said cross-joints is a plate 4, said plate having a plurality of apertures 5 therethrough adapted to receive the ends 6 of the pipes 2, said ends 6 being swaged as at 7 for securing the ends of the pipes in these apertures, said swaging being of a manner customary in attaching boiler pipes to boiler plates. A housing 8, having suitable threads 9 on the outer periphery thereof, is threaded into the cross-joint against a washer 10, which has previously been mounted in the cross-joint and which is seated against the outer plate 4, thereby forming a tight joint.

A central threaded aperture 11, is formed through the housing 8, into which are threaded suitable supply pipes 12, one of said supply pipes delivering the water from a pump or other suitable source to the heater, and the opposite pipe feeding the water to the boiler after the same has been heated in my device, the water passing through the pipes 2 to be heated. In the lower threaded opening of one of the cross-joints, I thread a steam pipe 13, and into the upper threaded opening of the opposite cross-joint I thread a steam pipe 14, the steam pipe 13 supplying steam to my device, and the steam pipe 14 discharging the steam. If desired, these two pipes can be reversed so that pipe 13 can be put into the lower opening of the opposite cross-joint, and pipe 14 into the upper opening of the first mentioned cross-joint. The remaining openings of the cross-joints are closed by suitable plugs 15, these plugs permitting the draining and cleaning of my device. By removing the plugs 15 and housings 8 the shell 1 and tubes 2 may be thoroughly cleaned.

My device is primarily intended as an auxiliary water heater to a steam boiler, and in operation the supply pipes 12 are connected, one to the pump, and the other to the boiler, so that the water is fed from the pump through my device and into the boiler. The pipe 13 is connected to the steam exhaust of the engine to which the boiler is attached, and is adapted to feed steam through my device in the direction of the arrows shown in Fig. 2, said steam being exhausted through the pipe 14. By this arrangement of the steam inlet and outlet pipes, the steam completely surrounds the pipes 2, which are comparatively small in diameter, thereby only holding a small quantity of water at one time, and the steam traveling along the entire lengths of the pipes 2, provides for the efficient heating of the water, and the utilization of all of the heat of the exhaust steam. The water in the pipes 2, while being efficiently heated, is fed through the pipe 12 leading to the boiler, whereby less fuel is required to heat the water in the boiler, my device thereby combining in one to act as a water heater and as a fuel saver.

It is to be noted in the construction of my water heater that the steam supply pipe 13 is

positioned at the end of the heater where the heated water is discharged therefrom to the boiler, and that the steam exhaust pipe 14 is positioned at the opposite end of the heater where the cooler water is taken in from the pump or other source of water supply, and by this arrangement I am enabled to more efficiently heat the water by the exhaust steam, in view of the fact, that the fresh steam containing the greatest heating qualities comes in contact with the ends of the pipes 2 where the water is the hottest, this being occasioned by the water being gradually heated in its progress through the pipes 2 by coming in contact with the successive and more highly heated portions of the pipes 2 as the water advances therethrough toward the discharge end of the heater, whereby when the water reaches this point the same is sufficiently highly heated as to cause little or no condensation of the fresh steam discharged from the pipe 13 into the heater. Furthermore, by the use of the cross-joints, as illustrated in the drawings, the plug 15 opposite the pipe 13 may be removed and a second supply pipe may be threaded in this opening of the cross-joint and the exhaust steam from a second engine delivered into the heater, and if desired the plug 15 opposite the exhaust pipe 14 may be removed and a second exhaust pipe threaded in the opening of this cross-joint, and in this manner the water may be more rapidly heated for supplying a boiler running two or more engines.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is,

A water heating device for boilers, comprising an elongated cylindrical steam casing having threaded ends, cross-joints having a plurality of right angularly disposed threaded openings of equal diameters, one of said threaded openings of said cross-joints threaded upon the ends of said steam casing, pipe plates mounted in the openings of said cross-joints opposite to the openings engaging the ends of said steam casing and having a plurality of apertures therein, a plurality of water pipes mounted in said apertures of said pipe plates and extending through said steam casing and projecting across said cross-joints, ring washers mounted in said cross-joints exteriorly of said plates, apertured housings threaded in said cross-joints and compressing said washers against said pipe plates, a water supply pipe threaded in the aperture of the housing at the receiving end of said heater, a water discharge pipe threaded in the aperture of the housing at the discharge end of said heater, a steam supply pipe threaded in one of the openings of the cross-joint at the discharge end of said heater at right angles to said water pipes, a steam discharge pipe threaded in one of the openings of the cross-joint at the receiving end of said heater at right angles to said water pipes, and plugs threaded in the unused openings of said cross-joints, said plugs capable of removal to provide for the substitution of additional steam supply and discharge pipes when desired.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN W. SNIDER.

Witnesses:
MANLY E. SNIDER,
CARL A. HOOVER.

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