

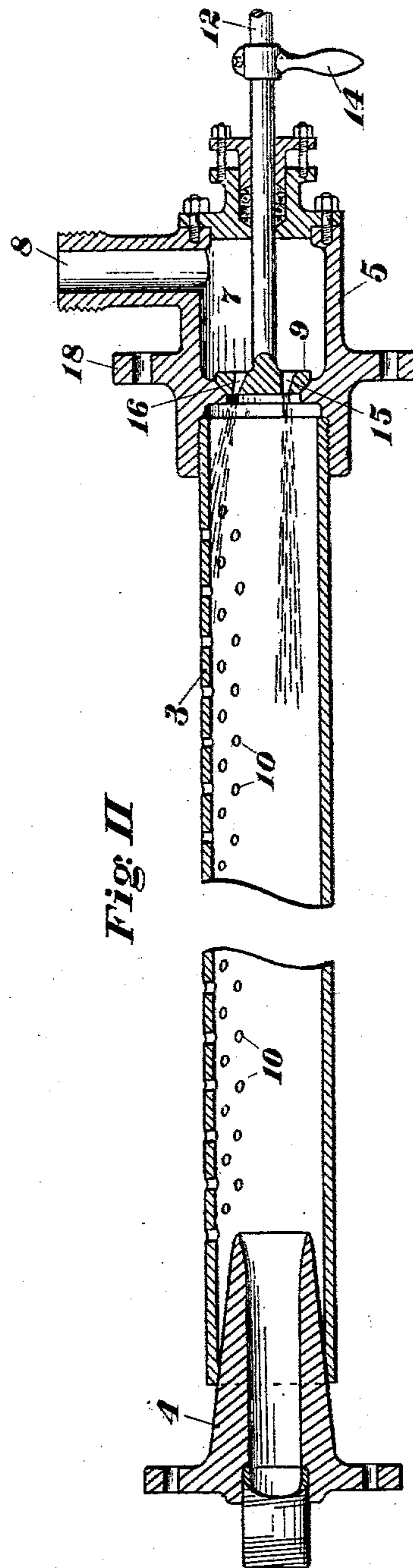
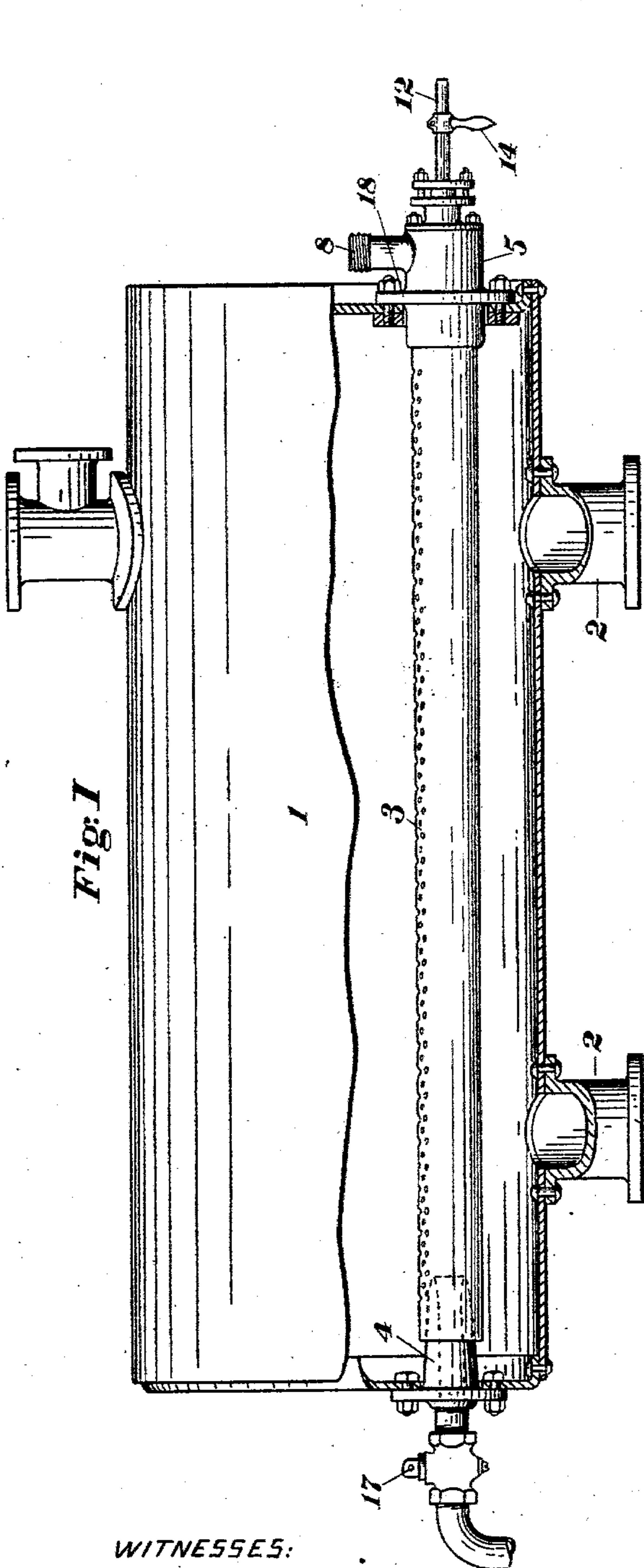
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Patented Dec. 9, 1902.

W. J. THOMAS & J. B. STETSON.
LOCOMOTIVE STEAM BOILER.

(Application filed Feb. 26, 1902.)

(No Model.)



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LOCOMOTIVE STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 715,319, dated December 9, 1902.

Application filed February 26, 1902. Serial No. 95,747. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM JAMES THOMAS, residing at Sausalito, county of Marin, and JAMES B. STETSON, residing at San Francisco, county of San Francisco, State of California, have invented certain new and useful Improvements in Locomotive Steam-Boilers; and we hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to steam-boilers, especially locomotive-boilers, and to a means of protecting the main shell from variations of temperature, also from sediment, incrustation, and injurious effects arising from impure water.

Our invention consists in providing a steam-drum to be mounted on and in connection with the hottest part of a locomotive-boiler and a chamber within this drum to which the feed or supply water is furnished and in which this water is heated to the maximum temperature of the main boiler, by which heating mineral or other impurities are precipitated, the cleansed and heated water passing through perforations in the top of this chamber and down to the water-space below.

Our invention also consists in a manner of introducing the supply-water to this chamber, whereby the water can be forcibly sprayed over the interior surfaces thereof to wash out the deposits therein, and a blow-off cock or valve by which this chamber can be blown out at frequent intervals without interfering with the regular working of the boiler or the water contained therein.

The object of our invention is to provide locomotive-boilers with apparatus external to the main shell that effectually protects the evaporating-surfaces and the whole interior of a locomotive-boiler from changes of temperature, such as arise when the supply-water is forced directly into the main shell; also, protects the main boiler from the effects of impure water to which locomotive-boilers are especially exposed; also, to the arrangement of such apparatus within the space available and to the peculiar circumstances of use in locomotive-engines.

To apply our invention, we provide, in regular cases, devices such as are shown in the accompanying drawings, forming a part of this specification.

Figure I represents, partially in section, a steam-drum provided with our improvements; Fig. II, an enlarged longitudinal section through the ante or settling chamber removed from the steam-drum.

A frequent cause of accident and derangement in locomotive steam-boilers is the contraction and expansion of the parts by the injection of supply-water at a temperature lower than that in the boiler, producing leaks around tubes, stay-bolts, and in other ways. There is also the difficulty that locomotives have to use supply-water such as can be procured along their course, making it difficult to keep the boilers free from mineral or other deposits. The want of space and other circumstances preclude the use of heaters and such devices as are employed in the case of stationary boilers, while the requirements demand effective apparatus for heating the supply-water to a maximum temperature before it enters the boiler, also precipitating and removing impurities from the feed-water without increasing the general dimensions of a boiler or complicating its care and operation. To this end we provide apparatus as shown in the drawings.

The steam-drum 1 is set above and parallel to a steam-boiler, to which it is attached by the usual nipples 2. Near the bottom of this drum 1 is placed a chamber 3, preferably a cylinder or tube, supported at the rear by a flanged nipple 4 and at the front by a removable flanged member 5, that permits the chamber 3 and its fittings to be conveniently withdrawn from the drum 1. The supply-water is forced into the chamber 7 in the part 5 through the nipple 8, that can stand in any convenient position, and passes through or around a valve 9 into the chamber 3, rises through the perforations 10 into the steam-drum 1, is there heated to the maximum temperature, and drains down into the boiler through the nipples 2 to the water-space of the boiler.

The valve 9 is attached to and operated by a rod 12 and a handle 14. In regular working

this valve 9 is drawn back into the chamber 7, leaving a free passage for the supply-water into the main chamber 3; but when the chamber 3 is to be cleansed this valve is closed, as shown in Fig. II.

The valve 9 has through it two or more perforations 15 and 16, the latter divergent to wash the interior sides of the chamber 3, and the others 15 parallel to the axis of this chamber, so as to wash the bottom and drive the sediment toward the cock 17.

When the chamber 3 is to be blown out, the cock 17 is opened, the supply-water is increased, the valve 9 is closed, as shown in Fig. II, and is slowly turned by means of the rod 12 and the handle 14, so the divergent jet 16 will sweep out the interior of the chamber 3 and drive the precipitated impurities to the cock 17, where they will be discharged. As this operation of blowing out does not in any way interfere with the water in the main boiler, it can be done at long or short intervals or omitted altogether when not required, and, as may be seen, does not interfere in any way with the working of a locomotive while under way. The cock 17 has a connection to the cab or engineer's station, so that it can be operated simultaneously with the valve 9.

The conical hollow nipple 4 is flanged on the outside and attached to the end of the drum 1, also is made hollow to form a blow-off passage and by means of a cone, as shown, or a socket forms a detachable support for the inner end of the chamber 3, which can be readily withdrawn therefrom and replaced by detaching the flange 18.

It will be understood that the drum can be riveted on and form an integral part of a locomotive-boiler or made in different forms from that shown; also, that the chamber 3 might be inserted in the top of the steam-space of a boiler, but not to act so effectually. The arrangement shown is simple and is satisfactory in service.

Having thus explained the nature and objects of our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a water heating and cleansing appa-

ratus for locomotive-boilers, a superimposed drum connecting with the boiler, having a chamber within said drum connected at one end with the water-supply, furnished at the other end with a cock and blow-off passage, and provided in the top with perforations through which the feed-water enters the said drum and becomes heated and thence passes down through the connections into the boiler, substantially as specified.

2. In a water heating and cleansing apparatus for locomotive-boilers, a superimposed drum or chamber connecting with and forming a part of the steam-space of the boiler, inclosed in this steam-drum a chamber connecting with the water-supply and a blow-out passage, and a valve at the receiving end perforated to produce jets, in the manner and for the purposes specified.

3. In a water heating and cleansing apparatus for locomotive-boilers, a superimposed steam drum or chamber in connection with and forming a part of the steam-space, an internal chamber to which the supply-water is forced, a blow-out way for sediment, a movable valve at the end of this chamber, a rod or stem to operate this valve and external means to revolve the same, combined and operating substantially as described.

4. In water-cleansing apparatus for locomotives, a precipitating-chamber mounted above or in the steam-space of the boiler, connections to this chamber for water-supply, and a flanged extension at the front by which this precipitating-chamber can be removed, a detachable support for the other end of this chamber and a blow-out passage therefrom, in the manner and for the purposes substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM JAMES THOMAS.
JAMES B. STETSON.

Witnesses:

P. W. J. LANDER,
ALFRED A. ENQUIST.