

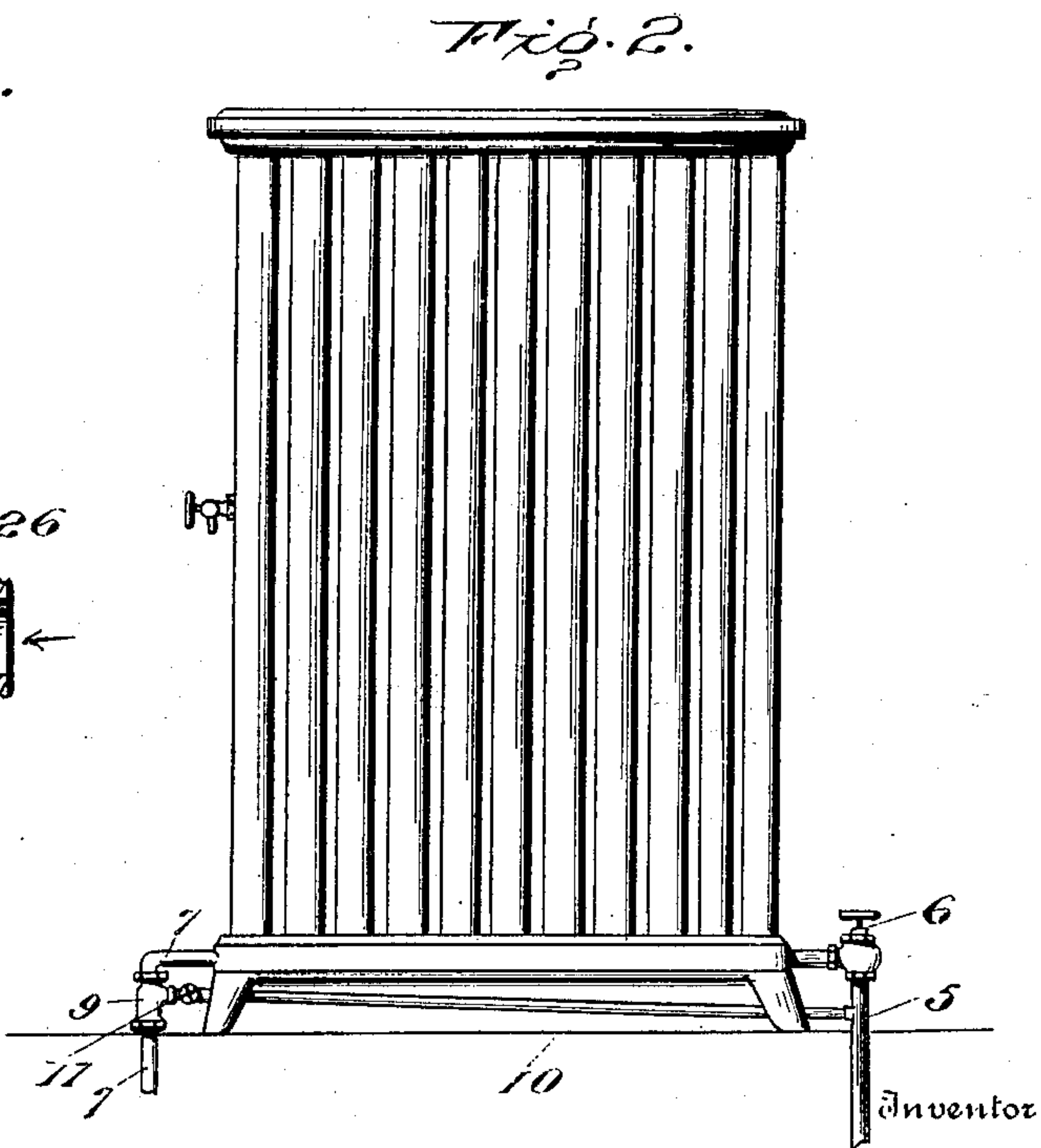
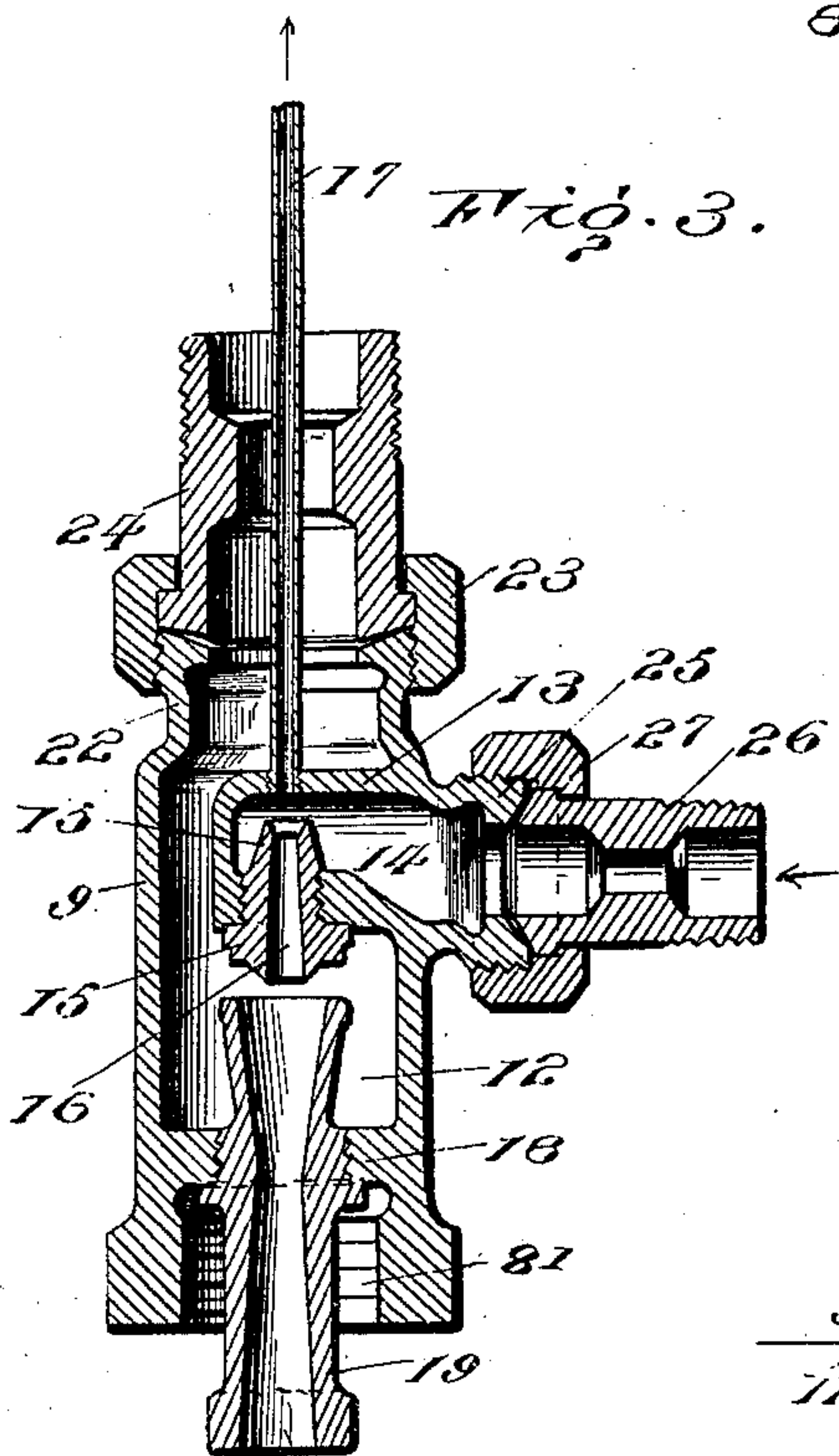
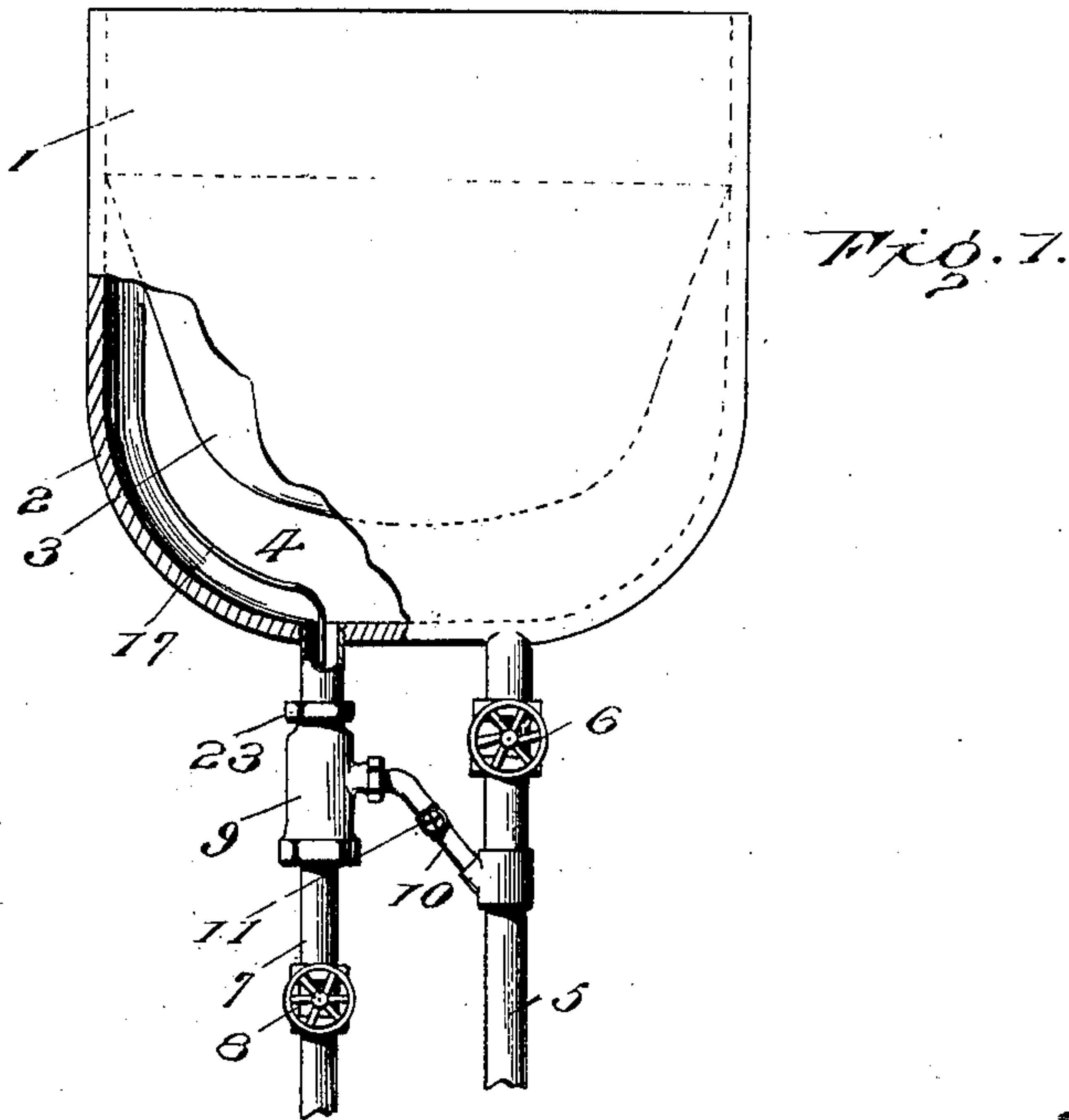
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F. M. KIMBALL.
ATTACHMENT FOR JACKET KETTLES, &c.

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NO MODEL.



Witnesses 20

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ATTACHMENT FOR JACKET-KETTLES, &c.

SPECIFICATION forming part of Letters Patent No. 754,779, dated March 15, 1904.

Application filed November 7, 1903. Serial No. 180,239. (No model.)

To all whom it may concern:

Be it known that I, FRED M. KIMBALL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Attachments for Jacket-Kettles, &c.; 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 certain new and useful improvements in jacketed kettles and radiators adapted to be heated by the use of live steam.

In all jacketed kettles and radiators with which I am familiar and where live steam is employed as the heating agent there is necessary condensation of the steam, and the formation, therefore, of a vacuum. In heating-kettles this vacuum occurs at the top of the outer steam-jacket directly under the bottom of the inner kettle, and such vacuum operates to draw the products of condensation upward, thus further retarding the effect of the live steam when introduced. To obviate these conditions, it is necessary to break the vacuum and to remove the products of condensation, and it has been customary to attempt to return a part of the product of condensation to a trap discharging into a well or receiver, from whence it is pumped back into the boiler; but in all such contrivances the return of such product to the boiler is not only partial, but slow where time is an object, such as in the use of heating-kettles, and consequently it has been customary to employ a valve or draw-off not connected with the return, but leading to the atmosphere, thus wasting the hot products of condensation and requiring considerable time.

My invention has for its object to cause the major part of any condensation to take place outside of the device to be heated to do away with the necessity of any draw-off cocks or traps to quicken the circulation, thus lessening the probability of condensation, and in the event of any such condensation occurring

in the kettle or radiator causing the same to be returned to the boiler by the action of the steam.

With these ends in view my invention consists of an attachment to be located between and connected with the steam-supply pipe and the apparatus or device to be heated and constructed and arranged as will be hereinafter and in detail described.

In order that those skilled in the art to which my invention appertains may know how to make and use my improved attachment, I will proceed to describe the construction and operation as well as the advantages of the same, referring by numerals to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of a steam-jacket kettle with steam-supply and return-pipes and with my improved attachment secured in position. Fig. 2 is an elevation of an ordinary steam-heating radiator with my attachment connected therewith; and Fig. 3 is a central vertical section, on enlarged scale, of my improved attachment.

Similar reference-numerals indicate like parts in the several figures of the drawings.

Figure 1 represents an ordinary jacketed steam-kettle, 2 being the outer and 3 the inner walls thereof, a sufficient distance apart to provide a steam-circulating space 4. The steam-supply pipe 5 is connected at one end with the generating-boiler and at the other end with the space 4 of the kettle and is provided with an ordinary controlling-valve 6. The return-pipe 7 is also connected with the boiler and is likewise provided with a controlling-valve 8. Attached to the return-pipe 7 is my improved attachment 9, which is connected also with the steam-supply pipe 5 by means of suitable union-joints and a branch pipe 10, provided with a controlling-valve 11.

In Fig. 2 I have shown my improved attachment connected with an ordinary steam-radiator. In describing the peculiarities of construction of my improved attachment especial reference is made to Fig. 3. The shell or body 9 is cast with a central chamber 12,

having projecting therein a wall 13 to constitute a transverse chamber 14. The space between the wall 13 and the body 9 of the attachment is sufficient to constitute a free
 5 passage for the products of condensation from the space 4 of a kettle or from the interior of an ordinary steam-radiator. Within a threaded passage in the bottom of the transverse chamber 14 is secured an injector and
 10 ejector nipple 15. In the upper portion of the wall 13 and in alinement with the passage-way 16 through the nipple 15 is threaded one end of a ductile tube 17 in cross-section of about equal area to that of the passage-way 16
 15 through the nipple 15. Within the bottom wall or partition 18 of the chamber 12 is threaded a conduit 19, having an axial passage-way 20, restricted at or near the center and diverging toward each end, as clearly
 20 shown. The body 9 is internally threaded at the end 21, surrounding the water-conduit 19, by which it is readily connected with the return-pipe 7, and the upper end 22 is externally threaded to receive a ring nut 23, by
 25 means of which a removable coupling 24 is secured in place upon the upper end of the attachment 9. The coupling 24 and its seat in the end 22 of the attachment are ground to make a close joint, (or, if desired, a suitable
 30 packing-ring may be employed.) The upper end of the coupling 24 is externally threaded for connection directly to the kettle or radiator, as shown, or to a suitable exit-pipe attached thereto.
 35 25 is an externally-threaded radial nipple communicating axially with the transverse chamber 14, and 26 is a coupling similar to the coupling 24 and secured in place by a ring nut 27 and a tight joint made in the same
 40 manner as already described with reference to the coupling 24. The outer end of the coupling 26 is threaded and is thereby readily connected to the branch pipe 10 leading from the steam-supply pipe 5. From the construction described it will be readily understood that by loosening the ring nuts 23 and
 45 27 the couplings 24 and 26 can be readily attached to the inlet and outlet pipes and then fixed in steam-tight relation with the attachment by tightening the nuts.

When the several connections have been properly made, it will be seen that the passages in the nipple 15, pipe 17, and water-conduit 19 are all in axial alinement and that
 55 the inner or upper end of the conduit 19 occupies a plane slightly above the bottom wall or partition 18 of the chamber 12, so that the products of condensation accumulate in the chamber 12 and rise to the level of the upper
 60 end of the conduit 19 before they escape through the latter.

Having described the construction and arrangement of my improved attachment, I will now explain the operation of the same. The
 65 connections all being made, as shown more

particularly at Fig. 1, and all of the controlling-valves being closed except the valve 8, the valve 11 is then opened to admit live steam to the attachment, and it follows two
 70 courses, the major part going through the nipple 15 and conduit 20 back to the boiler through the return-pipe 7 and the balance going up through the tube 17 into the space between the jacket 1 and the kettle 2. The
 75 jet of steam entering the space between the jacket and kettle breaks the vacuum, and the products of condensation being then freed from the holding action of the vacuum precipitate by gravity into the attachment 9, and
 80 the live steam rushing through the nipple 15 and conduit 19 picks up the condensation and injects it into the boiler through the return-pipe 7, which latter being smaller in cross-section than the supply-pipe 5 the steam supplied by the supply-pipe exerts a greater
 85 pressure than the pressure in the boiler. The kettle being relieved of any minimum quantity of condensation and the vacuum therein having been broken, the valve 6 is opened to admit steam direct to the kettle, and the valves
 90 8 and 11 being also open the kettle may then be used in the ordinary manner.

From the construction of the attachment it will be seen that when the steam-supply to the kettle has been shut off most, if not all, of the
 95 products of condensation resulting from the steam left in the space 4 will precipitate to the chamber 12 of the attachment, leaving, however, a vacuum and possibly a small proportion of the products of condensation in the
 100 space 4 of the kettle, which vacuum is broken and the product of condensation, if any, is removed, as just explained. While I prefer to employ the ductile tube 17 to insure the introduction of the first introduction of steam
 105 above any water-line that may exist in the space 4, it will be understood that I do not consider this tube as a necessarily essential element of my improved attachment, as under all ordinary circumstances the area of the
 110 chamber 12 is sufficient to constitute a receptacle for the products of condensation and to constitute a relief for the kettle.

It will also be understood from the principle of operation of my improved attachment
 115 as described that it may be used successfully in connection with radiators, as shown at Fig. 2, or with other heating devices.

I do not wish to be confined to any particular shape or proportion in the construction of
 120 my attachment so long as the principle of operation is secured.

What I claim as new, and desire to secure by Letters Patent, is—

1. An attachment for jacket-kettles, radiators and other heating devices adapted to be
 125 connected with the interior space of the kettle, radiator, or other heating device, and to a return-pipe leading to a boiler, and formed with an interior chamber adapted to receive
 130

the products of condensation, and communicating with interior space of the kettle, radiator or other heating device, a transverse chamber adapted to be connected with a main supply-pipe leading from a boiler, and provided with a passage-way leading to the interior space of the kettle, radiator or other heating device and with a nipple in its opposite wall having a passage of greater area than the passage in the other wall; a conduit in the floor of condensation-chamber and communication with the return-pipe to a boiler; and valves or cocks intermediate of the attachment and the supply and return pipes, and a valve or cock in the main supply-pipe between the device to be heated and the connection between said supply-pipe and the attachment, substantially as and for the purpose set forth.

2. In combination with a jacket-kettle or other heating device and valve-controlled steam-supply and return pipes connected therewith, an attachment such as described, connected directly with the steam-space of the heating device and the return steam-pipe and connected also with the steam-supply pipe by

a valve-controlled pipe, and having a pipe leading from the steam-chamber of said attachment into the steam-space of the heating device, substantially as and for the purpose set forth.

3. An attachment for steam-kettles, radiators and other heating devices, consisting of a body adapted for connection with steam supply and return pipes and formed with a vertical interior condensing-chamber; a transverse steam-chamber provided with an upward steam-passage and a vertically-disposed steam-nipple; and a conduit with a restricted passage arranged in the floor of the condensing-chamber and extending above the same, substantially as and for the purpose hereinbefore set forth.

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

FRED M. KIMBALL.

Witnesses:

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H. C. MATHEWS.