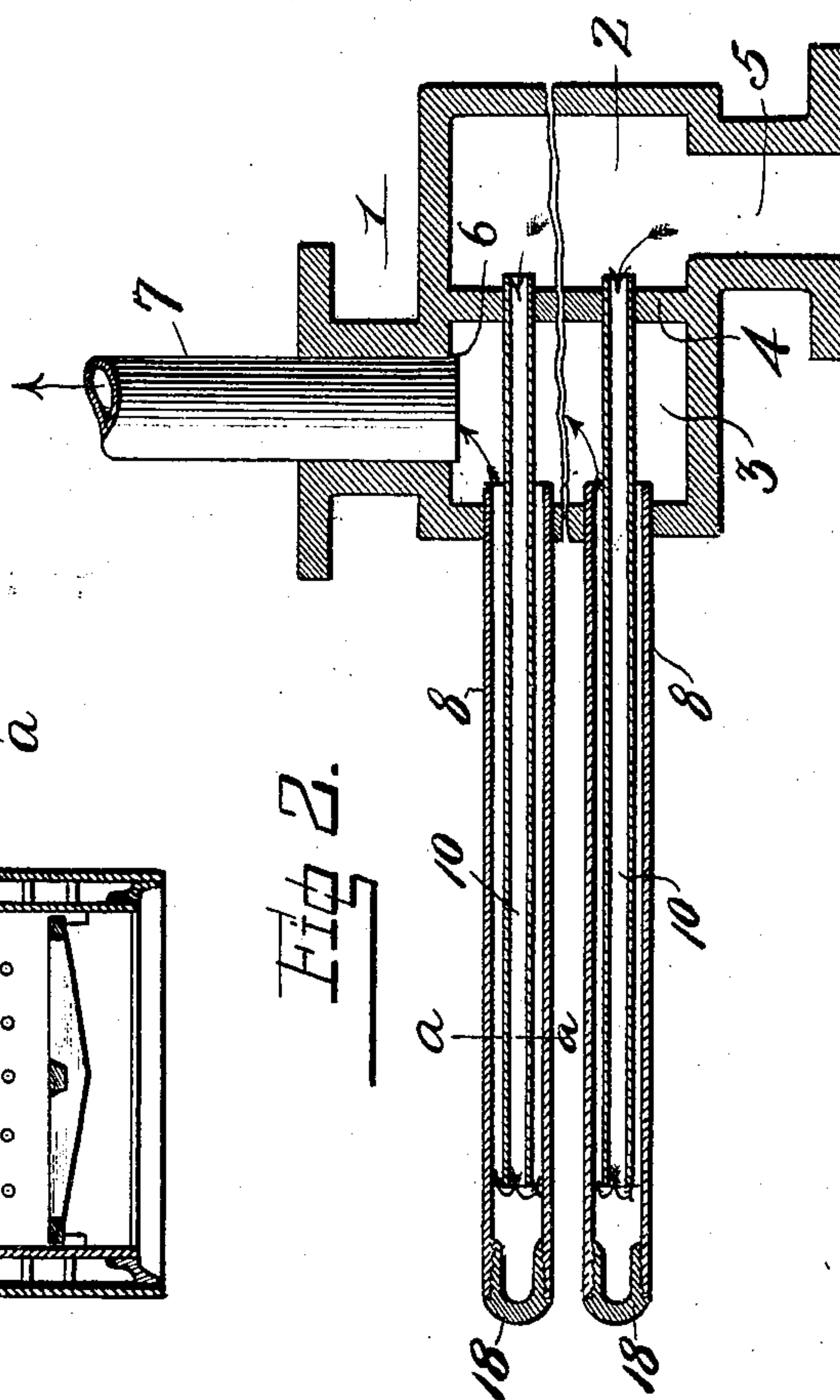
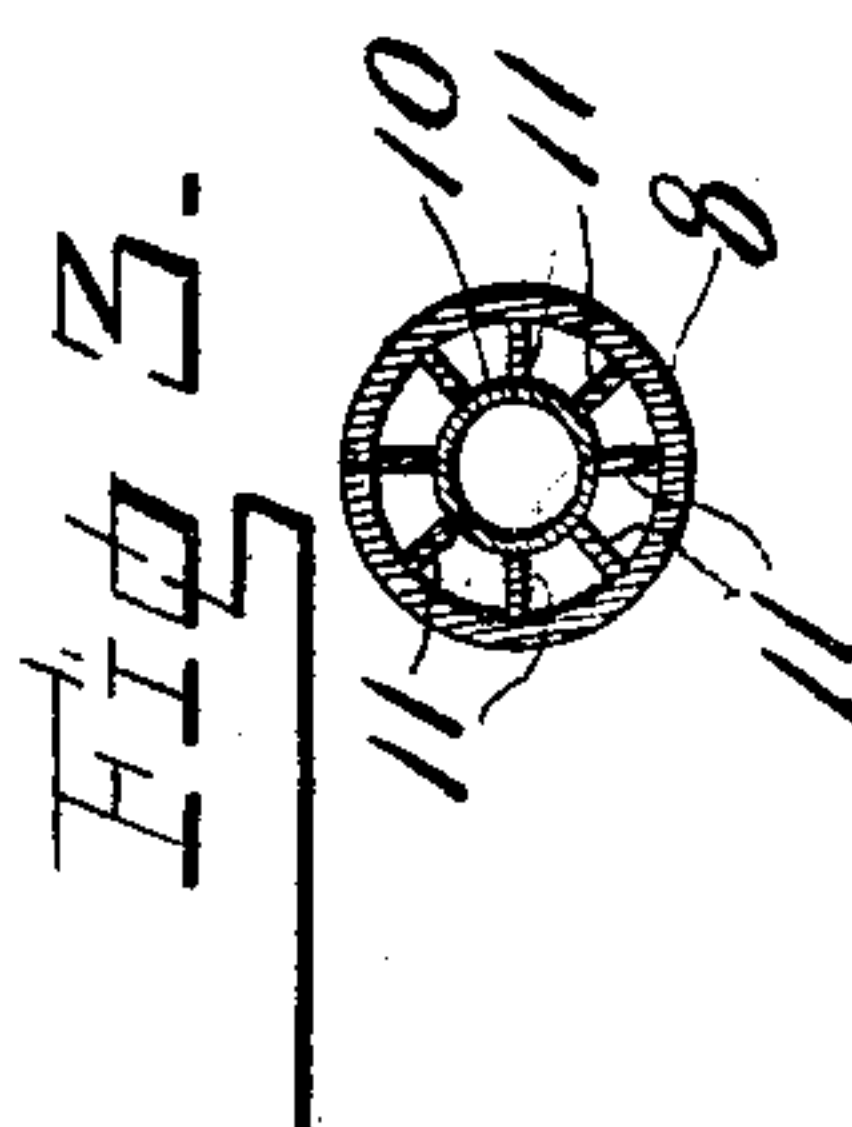
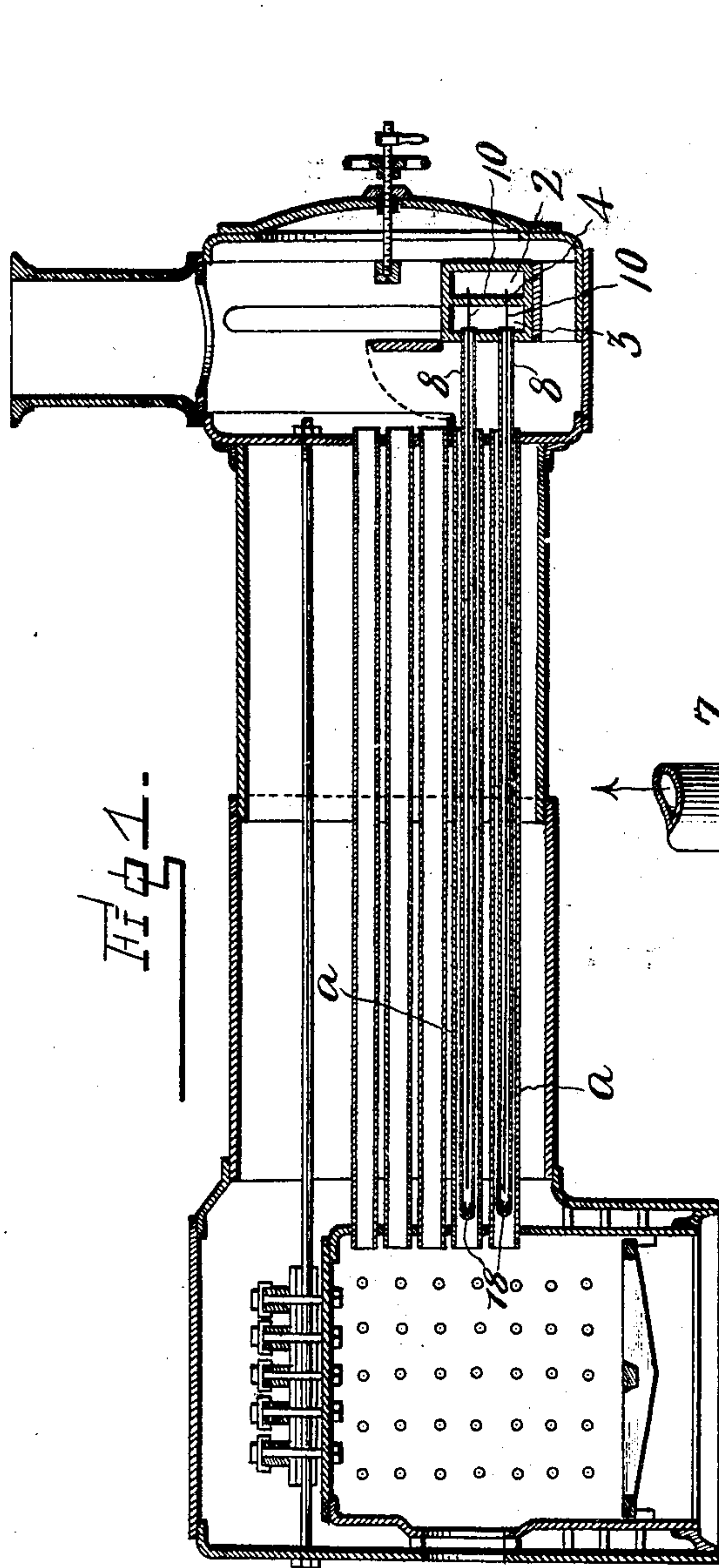


No. 774,335.

PATENTED NOV. 8, 1904.

N. NOTKIN.
STEAM SUPERHEATER.
APPLICATION FILED FEB. 25, 1904.

NO MODEL.



Witnesses

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NAUM NOTKIN, OF MOSCOW, RUSSIA.

STEAM-SUPERHEATER.

SPECIFICATION forming part of Letters Patent No. 774,335, dated November 8, 1904.

Application filed February 25, 1904. Serial No. 195,279. (No model.)

To all whom it may concern:

Be it known that I, NAUM NOTKIN, a subject of the Emperor of Russia, residing at Moscow, Russia, have invented certain new and useful
 5 Improvements in Steam-Superheaters for Steam-Boilers; and I do 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
 10 the same.

My invention is an improved steam-superheater adapted for use in the smoke-tubes of locomotive or other steam boilers; and it consists in the construction, combination, and arrangement of devices hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of a locomotive-boiler provided with my improved
 20 steam-superheating device. Fig. 2 is a horizontal sectional view of my steam-superheating device, showing the same on a larger scale and detached from the boiler; and Fig. 3 is a transverse sectional view taken on the
 25 plane indicated by the line *a a* of Fig. 2.

In the embodiment of my invention I provide a junction-box 1, which is preferably of the form here shown, but it may be of any suitable form, is adapted to be placed in the
 30 smoke-box of a locomotive or other type of boiler, and is provided with an inlet-chamber 2 and an outlet-chamber 3, divided from each other by a wall or partition 4 and provided, respectively, with an inlet-opening 5 and a
 35 discharge-opening 6. A suitable steam-conduit, which is not here shown, as the same will be well understood by those skilled in this art, leads from the steam-space of the boiler to the inlet-chamber 2 to supply the
 40 latter with saturated steam from the boiler. A pipe 7 is connected to the discharge-opening 6 and serves as a conduit for the superheated steam.

Tubes 8 of suitable length and diameter are
 45 attached to the outer wall of the chamber 3 and extend from said chamber into the fire-tubes *a* of the boiler, as shown. The said tubes 8 may be of any suitable length and may extend through the said fire-tubes to any
 50 desired extent. The diameter of the said

tubes 8 is somewhat less than the interior diameter of the fire-box, so that the same do not obstruct the passage of heated gases and other products of combustion from the furnace through the fire-tubes. Each of the said
 55 tubes 8 is provided at the end nearest the furnace with a cap 18, secured thereto and forming a closure therefor, the said caps being preferably of the form here shown.

Within the tubes 8 are smaller tubes 10, 60 which are open at both ends and have their front or outer ends secured in openings in the partition-wall 4 of the junction-box and in communication with the chamber 2 thereof. To increase the heating-surfaces of the
 65 tubes 8, the latter are provided on their inner sides with longitudinal ribs 11, which are spaced apart and radially disposed. These ribs could, if preferred, be formed exteriorly on the inner tubes 10.

Owing to the reduced scale on which Fig. 1 is made the pipes 10 are each indicated therein by a single line. Said pipes are clearly
 70 shown in Fig. 2, which is on a larger scale.

As shown in the drawings, the operation of
 75 my invention is as follows: The saturated steam passes from the chamber 2 of the junction-box through the inner tubes 10 and is discharged therefrom into the outer tubes 8
 80 at a point near the fire-box. The outer tubes 8 are intensely heated by the heated gases and other products of combustion which pass through the fire-tubes of the boiler, so that the steam which is discharged into the tubes
 85 8 from the inner tubes 10 becomes superheated in said tubes 8, passes therefrom into the chamber 3 of the junction-box, and is discharged from the said chamber through the opening 6 and the pipe 7 attached thereto. It will be readily understood that this arrangement could be reversed without the exercise of invention to cause the saturated
 90 steam to be conveyed to the chamber 3, to pass through the tubes 8, become superheated therein, and to be discharged from the said
 95 tubes 8 through the tubes 10 and into the chamber 2. I therefore do not desire to limit myself in this particular, but reserve the right to use my improved device either way.

From the foregoing description, taken in 100

connection with the accompanying drawings, the construction and operation of my invention will be readily understood without requiring a more extended explanation.

5 Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

10 Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

A steam-superheating device, comprising a superheating-tube adapted to be located in a

fire-tube of a boiler and having one end closed 15 and the other end open, and an inner tube in the superheating-tube and having both ends open, one of said tubes being provided with longitudinally-disposed ribs forming enlarged superheating-surfaces therefor. 20

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

NAUM NOTKIN.

Witnesses:

ARTHUR STRATTON,
GUSTAV HARTMAN.