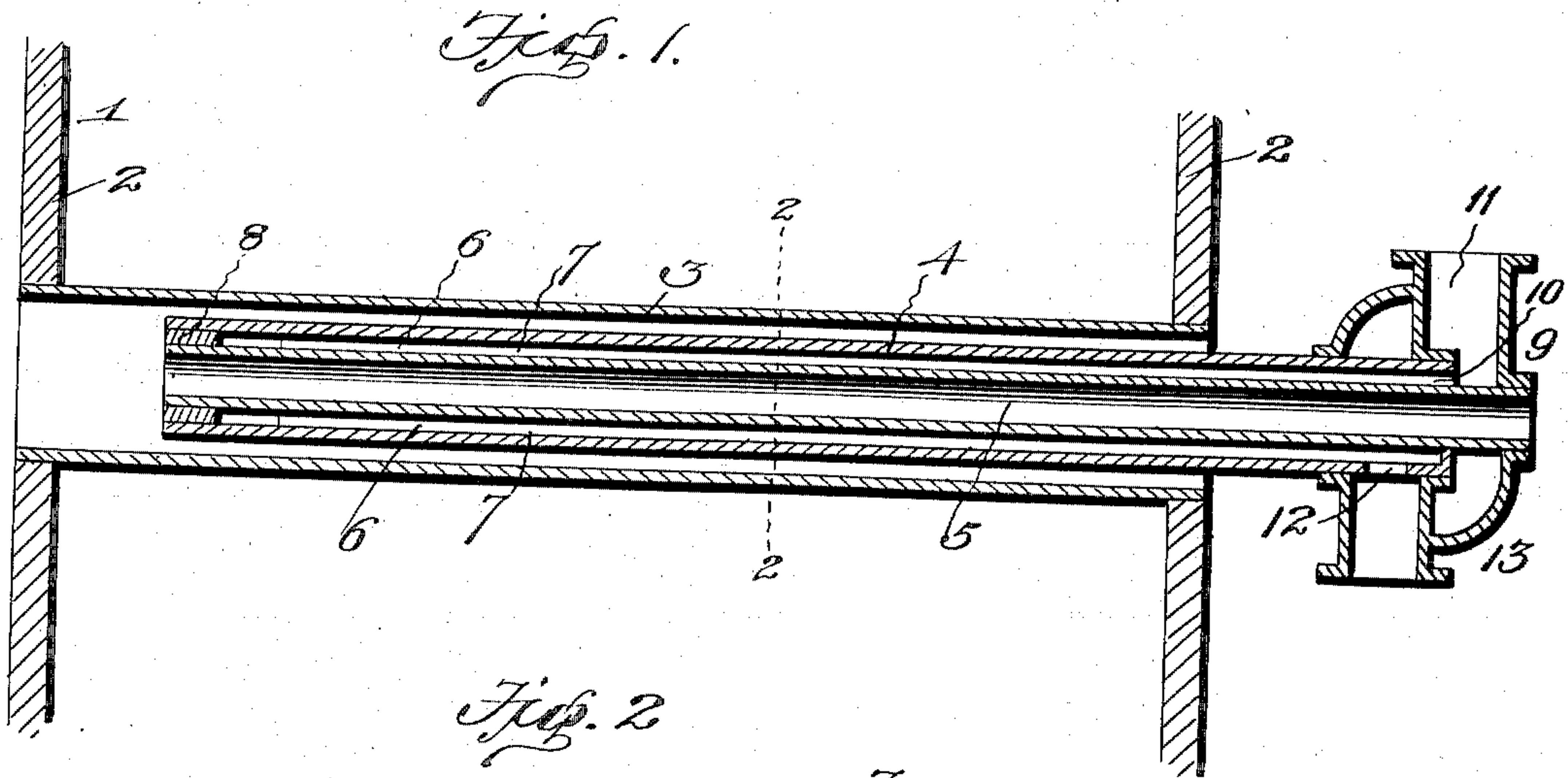


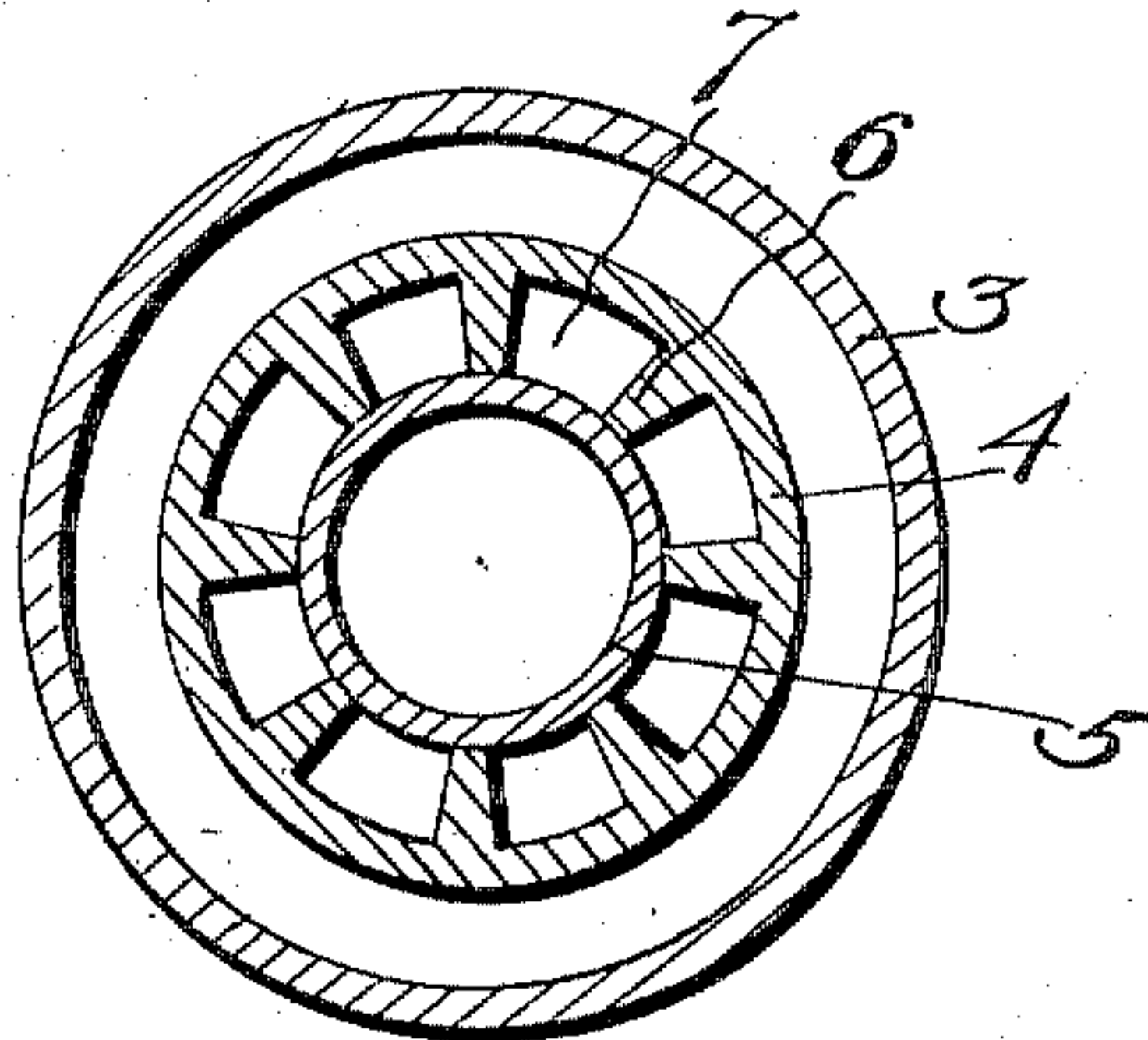
No. 816,993.

PATENTED APR. 3, 1906.

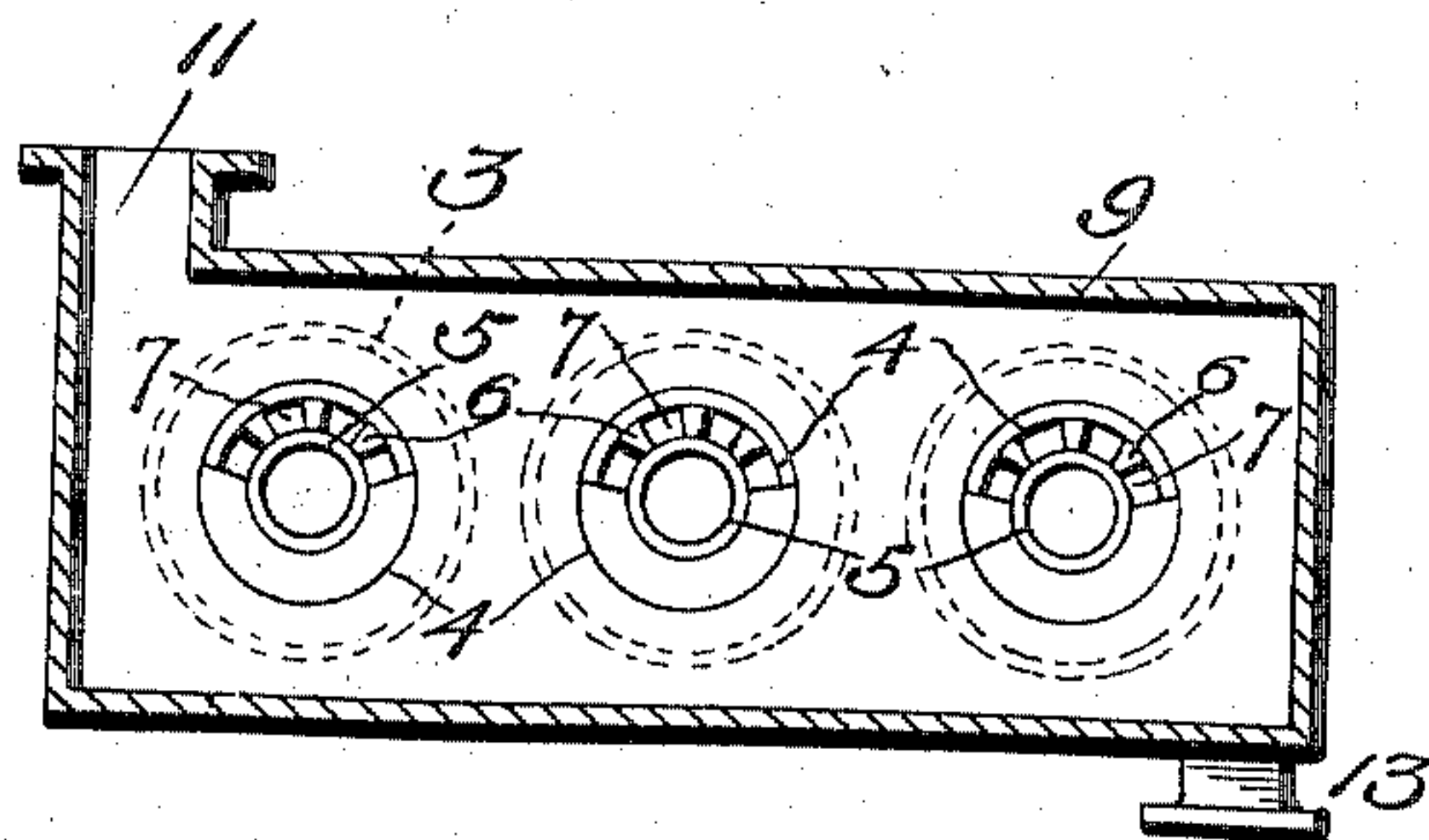
N. NOTKIN.  
SUPERHEATER.  
APPLICATION FILED SEPT. 29, 1905.



*Fig. 2.*



*Fig. 3.*



Witnesses  
*C. E. Hunt.*  
*C. H. Griesbauer.*

Inventor  
*Naum Notkin.*  
By *H. B. Wilson*  
Attorney



# UNITED STATES PATENT OFFICE.

NAUM NOTKIN, OF MOSCOW, RUSSIA.

## SUPERHEATER.

No. 816,993.

Specification of Letters Patent.

Patented April 3, 1906.

Application filed September 29, 1905. Serial No. 280,622.

*To all whom it may concern:*

Be it known that I, NAUM NOTKIN, a subject of the Czar of Russia, residing at Moscow, in the Empire of Russia, have invented certain new and useful Improvements in Superheaters; 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 the same.

My invention relates to superheaters; and one of the principal objects of the same is to provide means whereby the steam is confined within independent longitudinal channels and in which the heated gases from the furnace will surround said passages and superheat the steam.

Another object is to provide a superheating-tube with ribs extending intermediate an inner and outer tube and placing said tube within a fire-tube extending from the fire-box of a fire-tube boiler or within any smoke-channel or smoke-box of an ordinary boiler, so that the heat will entirely surround and envelop the superheating-tube.

These and other objects are attained by means of the construction illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of a superheating-tube inclosed within a fire-tube. Fig. 2 is a cross-section on the line 2 2 of Fig. 1, and Fig. 3 is a sectional view of a furnace and showing the superheating-tubes in end elevation.

Referring to the drawings for a more particular description of my invention, the numerals 1 and 2 designate the walls of a boiler, and 3 is a fire-tube leading from the fire-box end 1 of the boiler through one wall of the opposite side 2 thereof. Suspended within the fire-tube 3 is a superheating-tube comprising an outer tube 4 and a hollow inner tube 5. Ribs 6 connect these inner and outer tubes and form longitudinal steam-spaces 7, said spaces being closed at the fire-tube end by a suitable plug 8 and closed at the lower opposite end by means of a cover 9, the upper portion of said tube being open, as at 10, to communicate with a steam-inlet tube 11. Perforations 12 are formed in the outer tube of the superheater immediately above the junction-box 13.

In operation the heat from the fire-box en-

velops the superheating-tube and passes through the inner tube thereof, and as the steam is confined within comparatively small longitudinal channels in the superheating-tubes said steam is quickly and thoroughly heated and circulated through said channels. The steam enters between the tubes 4 5. through the opening 10, and circulates within the channels 7 and emerges through the perforations 12.

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.

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

1. A superheating-tube comprising an inner tube and an outer tube, intermediate ribs forming steam-channels, said tube being suspended within a fire-tube leading from the fire-box, said tube being closed at its inner end and partially open at the outer end, and means to admit steam to the one portion of its outer end and discharge the same on the opposite portion of its outer end.

2. A superheating-tube comprising an outer tube having a series of longitudinal ribs extending from its inner wall, a hollow inner tube, steam-chambers between the ribs and tubes, said superheating-tubes being suspended within a fire-tube, or placed in any smoke-channel or smoke-box, said superheating-tube being provided with inlet-openings near one end of one portion of the steam-chambers and discharge-openings on the same end in the opposite portion of chambers.

3. A superheating-tube comprising an inner tube and an outer tube, intermediate ribs forming restricted steam-channels, said tube being suspended within a fire-tube leading from the fire-box, said tube being closed at its inner end, and open at the upper portion of its outer end, and means to admit steam to the upper portion of its outer end and discharge the same at the lower portion of its outer end, substantially as described.

4. A superheating-tube comprising an outer tube having a series of longitudinal ribs extending from its inner wall, a hollow inner tube, restricted steam-chambers between the

ribs and tubes, said superheating-tubes being  
suspended within a fire-tube, said superheat-  
ing-tube extending through the fire-tube and  
provided with an inlet-opening near one end  
5 of its upper portion, and discharge-openings  
near the lower portion of the same end, sub-  
stantially as described.

In testimony whereof I have hereunto set  
my hand in presence of two subscribing wit-  
nesses.

NAUM NOTKIN.

Witnesses:

FRANCIS B. KEENE,  
L. H. MUNIER.