

No. 620,704.

Patented Mar. 7, 1899.

J. GRUBINSKI.

DEVICE FOR SUPERHEATING STEAM.

(Application filed Nov. 29, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 2.

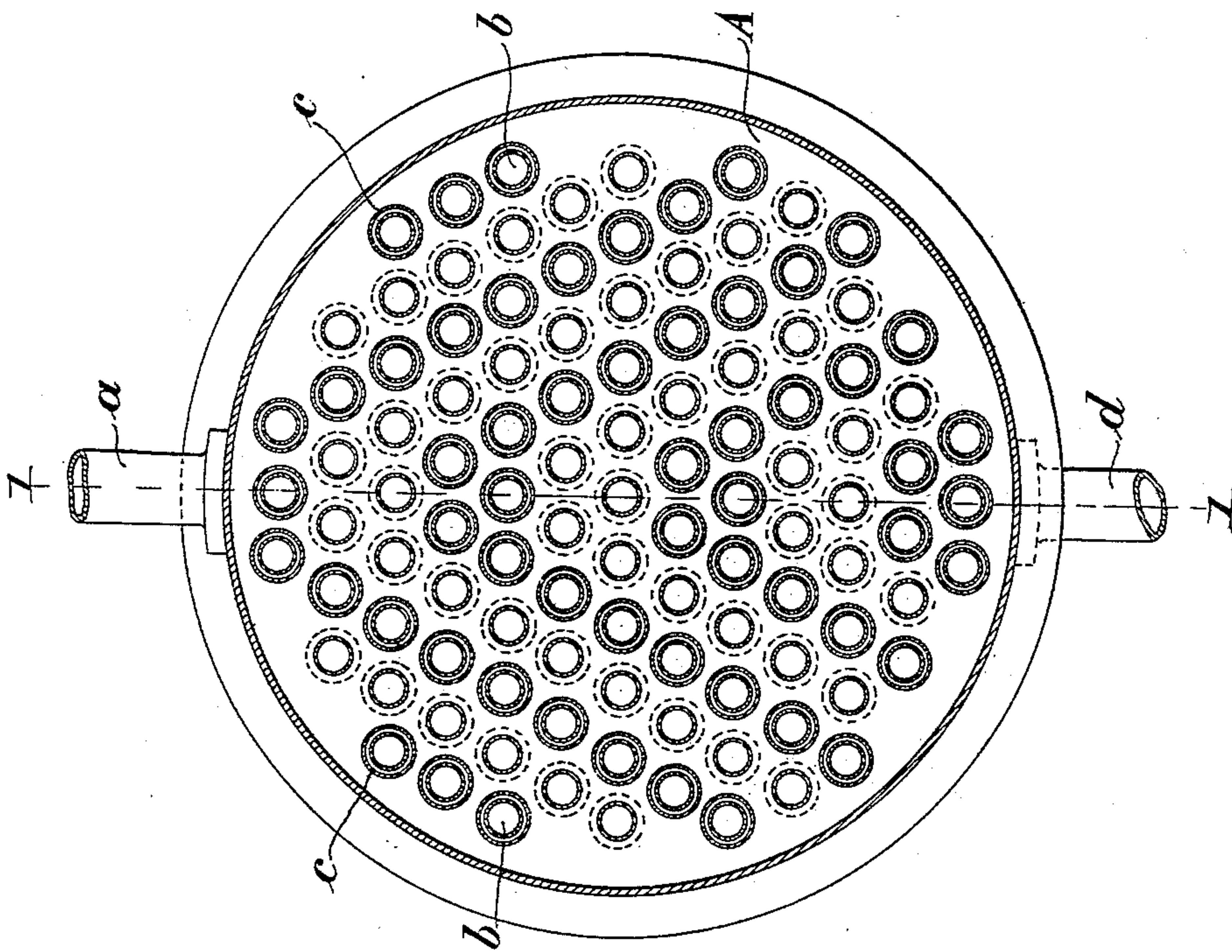
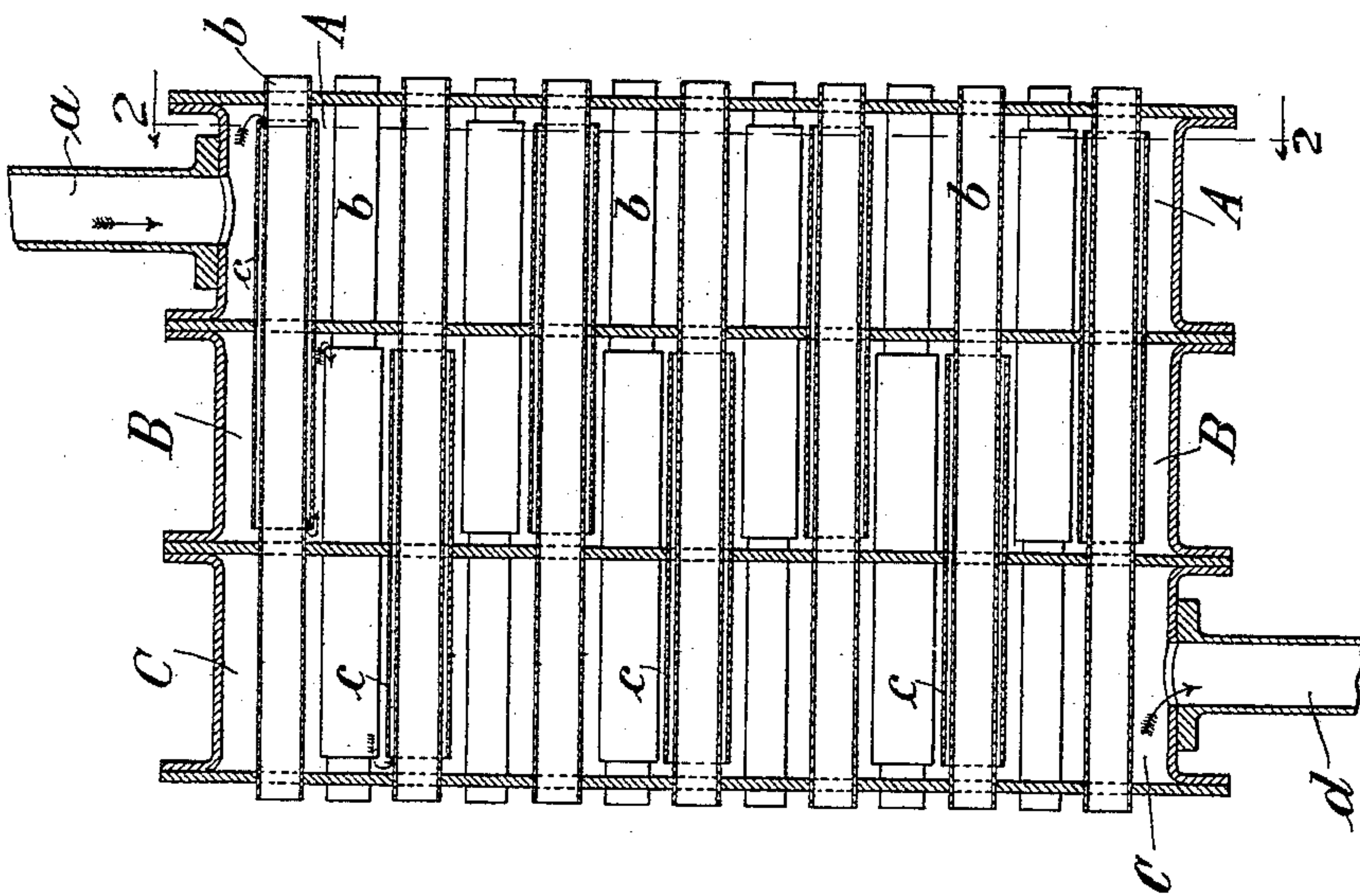


Fig. 1.



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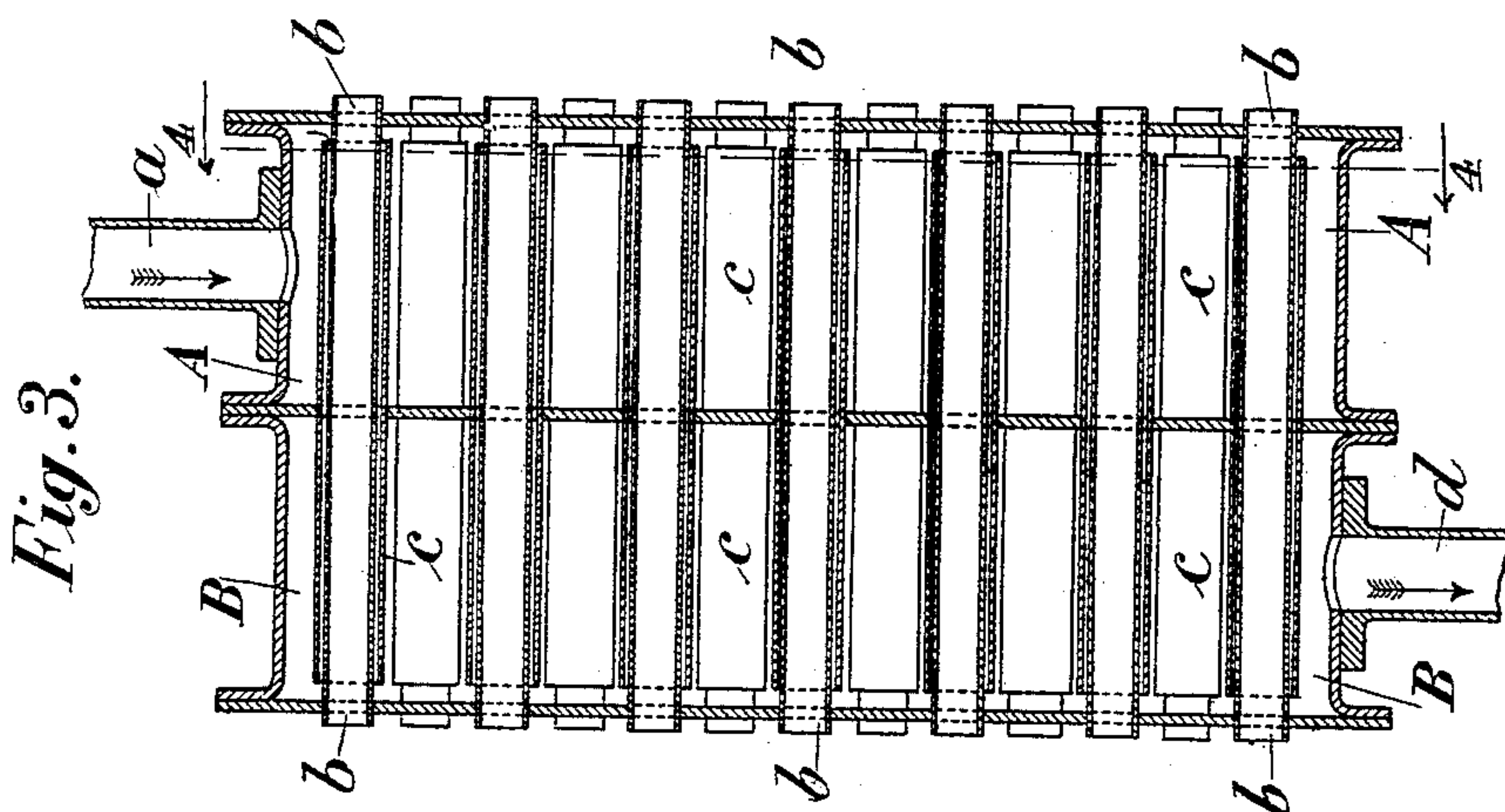
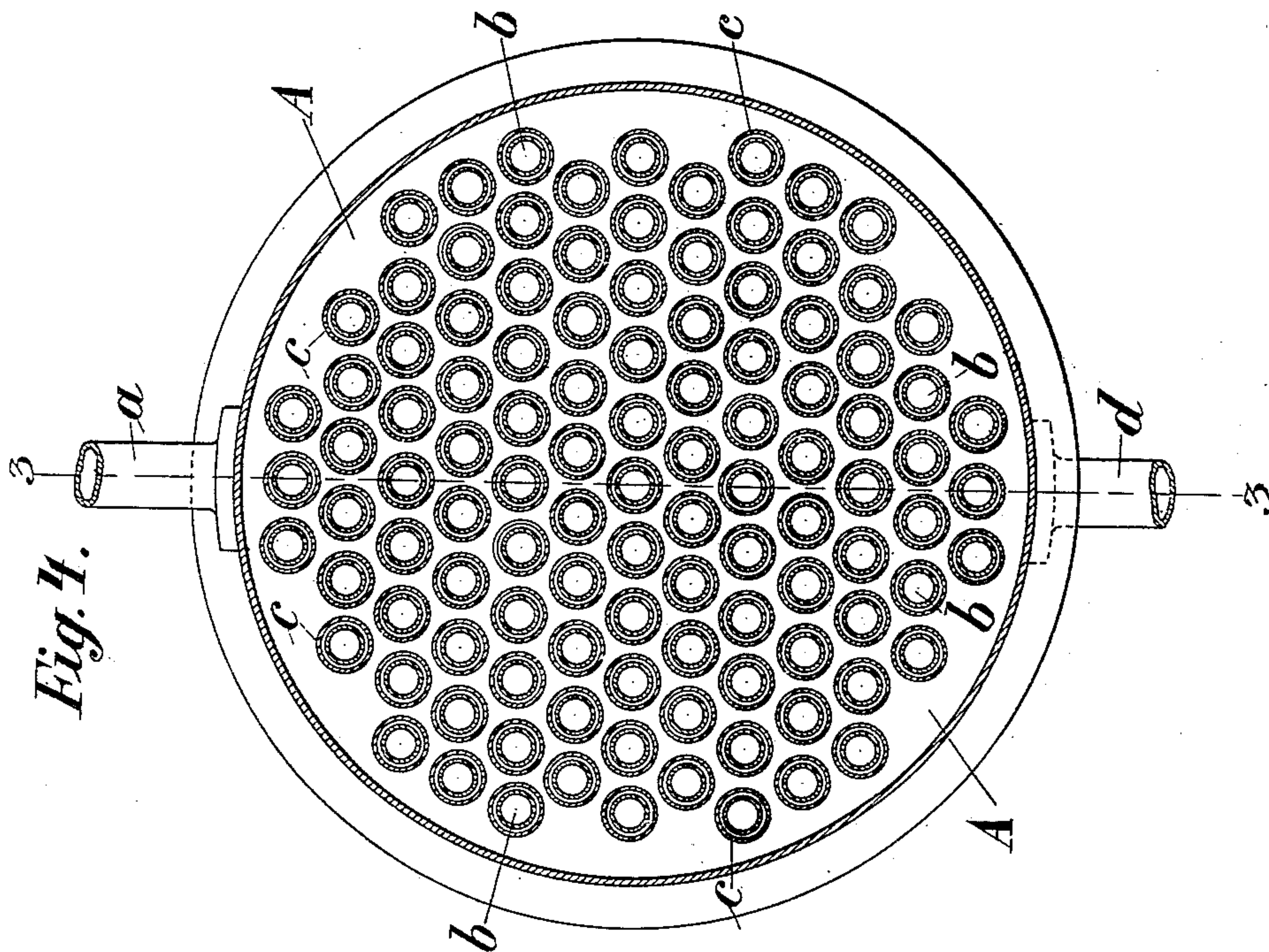
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UNITED STATES PATENT OFFICE.

JAN GRUBINSKI, OF WARSAW, RUSSIA.

DEVICE FOR SUPERHEATING STEAM.

SPECIFICATION forming part of Letters Patent No. 620,704, dated March 7, 1899.

Application filed November 29, 1897. Serial No. 660,100. (No model.)

To all whom it may concern:

Be it known that I, JAN GRUBINSKI, a subject of the Emperor of Russia, residing at Warsaw, Poland, Russia, have invented certain new and useful Improvements in a Device for Superheating Steam; and I hereby declare the following to be a full, clear, and exact description of the invention.

My invention relates to a novel construction in a device for superheating steam, the object being to provide a device of this kind in which the steam is brought into contact with the superheating-surfaces in a finely-divided state and flows in a direction opposite to the flow of the heated gases; and it consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a vertical longitudinal section of a device for superheating steam constructed in accordance with my invention, taken on the line 1 1 of Fig. 2. Fig. 2 is a vertical transverse section of the same on the line 2 2 of Fig. 1. Fig. 3 is a vertical longitudinal section on the line 3 3 of Fig. 4, showing a slightly-modified form of construction. Fig. 4 is a vertical transverse section on the line 4 4 of Fig. 3.

Referring now to said drawings, A, B, and C indicate three chambers into which my device is divided and through which the steam passes successively from the inlet-pipe *a* to the outlet-pipe *d*. Flues *b* pass through all of said chambers A, B, and C, through which the products of combustion pass in the direction indicated by the arrows in Fig. 1. Pipes *c*, of slightly greater diameter than said flues *b* and of less length than the combined length of two of said chambers A, B, and C, are mounted in the partitions between said chambers and surrounding said flues *b*, so that the small ring-shaped spaces between said flues *b* and pipes *c* afford the only communication between said chambers. Some of said pipes *c* are interposed between the chambers A and B and others between the chambers B and C and are so arranged as to receive and deliver

the steam at points farthest from the dividing-wall between two chambers. The steam enters through the pipe *a* and passes from chamber A into chamber B through said ring-shaped spaces between the pipes *c* and flues *b* and likewise from chamber B to chamber C, so that the general direction of its flow is opposite to that of the heated gases passing through said flues *b*. By means of said pipes *c* said steam is finely divided—that is, a small volume thereof is brought into contact with a large heating-surface, and it is thus quickly superheated to an intense degree. Its direction of flow with relation to the hot gases is also such that the steam just entering first encounters the least-heated portions of the flues, as will be obvious, and gradually as it is superheated encounters the more intensely-heated portions of said flues.

In Figs. 3 and 4 I have shown a modified form of construction in which only two chambers are employed, the connection between the same being effected in the same manner as between two of the chambers of the device shown in Figs. 1 and 2, except that a pipe *c* surrounds every flue *b*.

I claim as my invention—

In a steam-superheater, a casing intersected by flues and divided into a plurality of compartments, a steam-inlet in one end compartment, a steam-outlet from the other end compartment, and means for establishing communication between said compartments comprising tubes of larger diameter than said flues and of slightly less length than the combined length of two of said compartments surrounding said flues and passing through said partitions between said compartments whereby the steam admitted is caused to pass through the ring-shaped passages between said flues and said tubes, substantially as described.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

JAN GRUBINSKI. [L. S.]

Witnesses:

KEJETAN N. LODOWSKI,
JAN BZTHOWSKI.