

(No Model.)

G. ZAHIKIAN.
STEAM GENERATOR.

No. 518,016.

Patented Apr. 10, 1894.

FIG. 1.

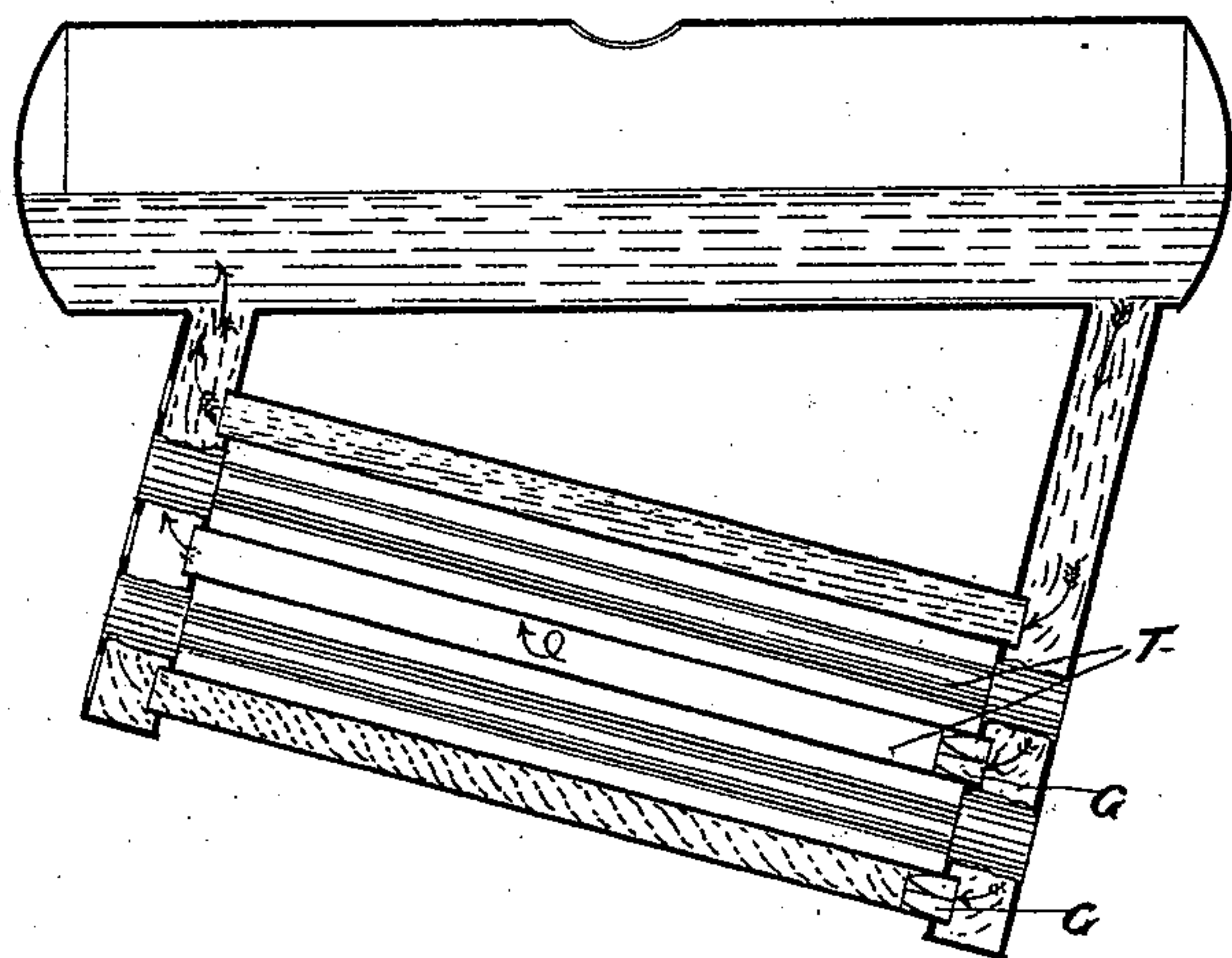


FIG. 4.

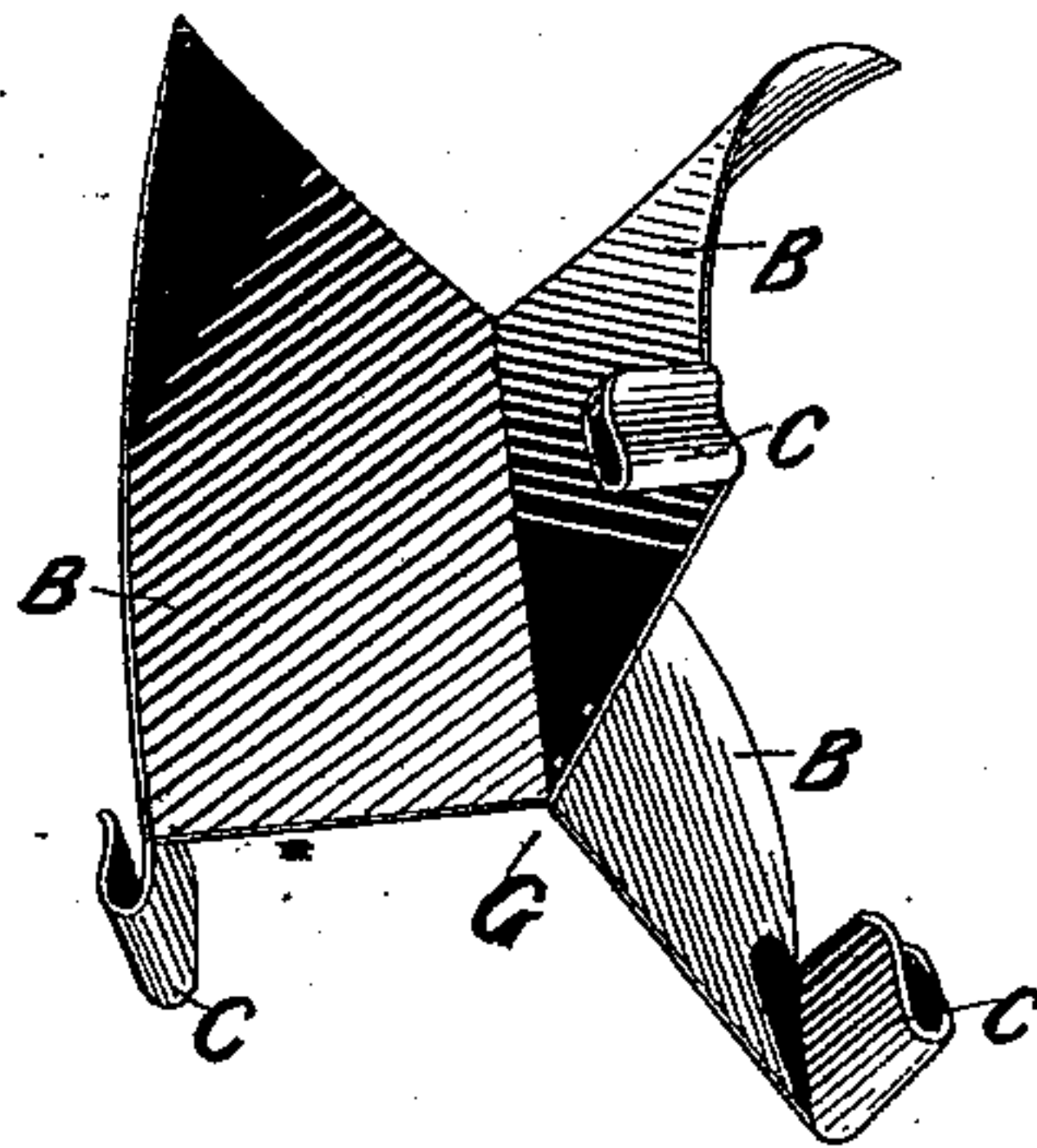


FIG. 2.

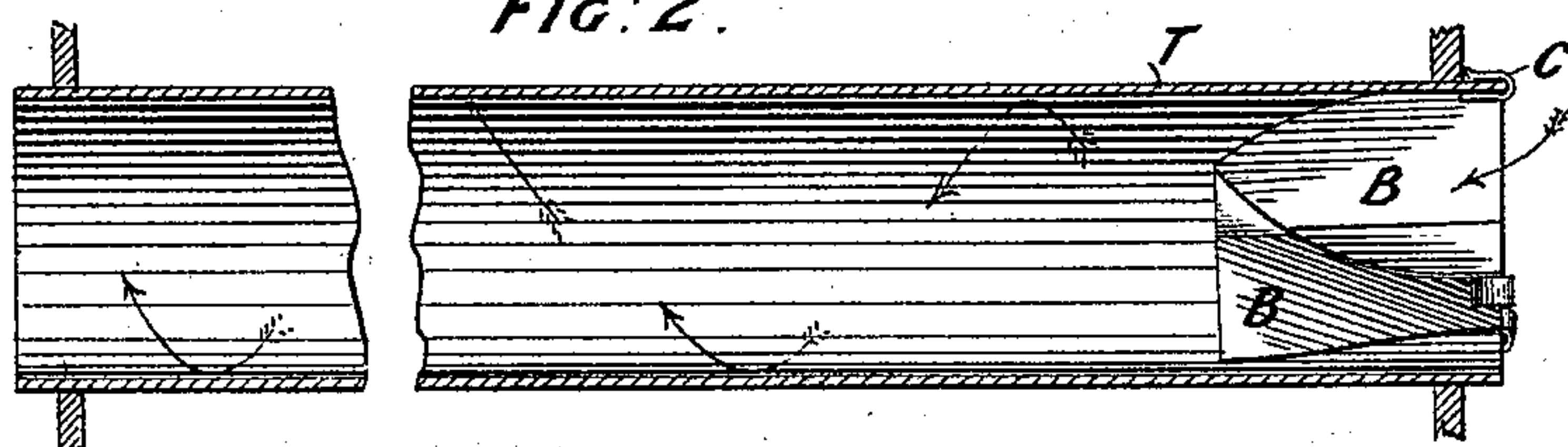


FIG. 3.

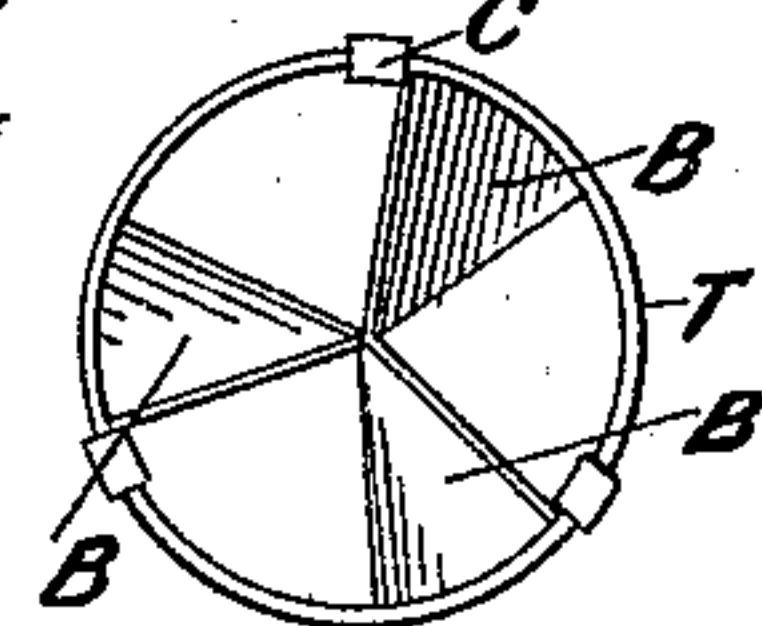


FIG. 5.

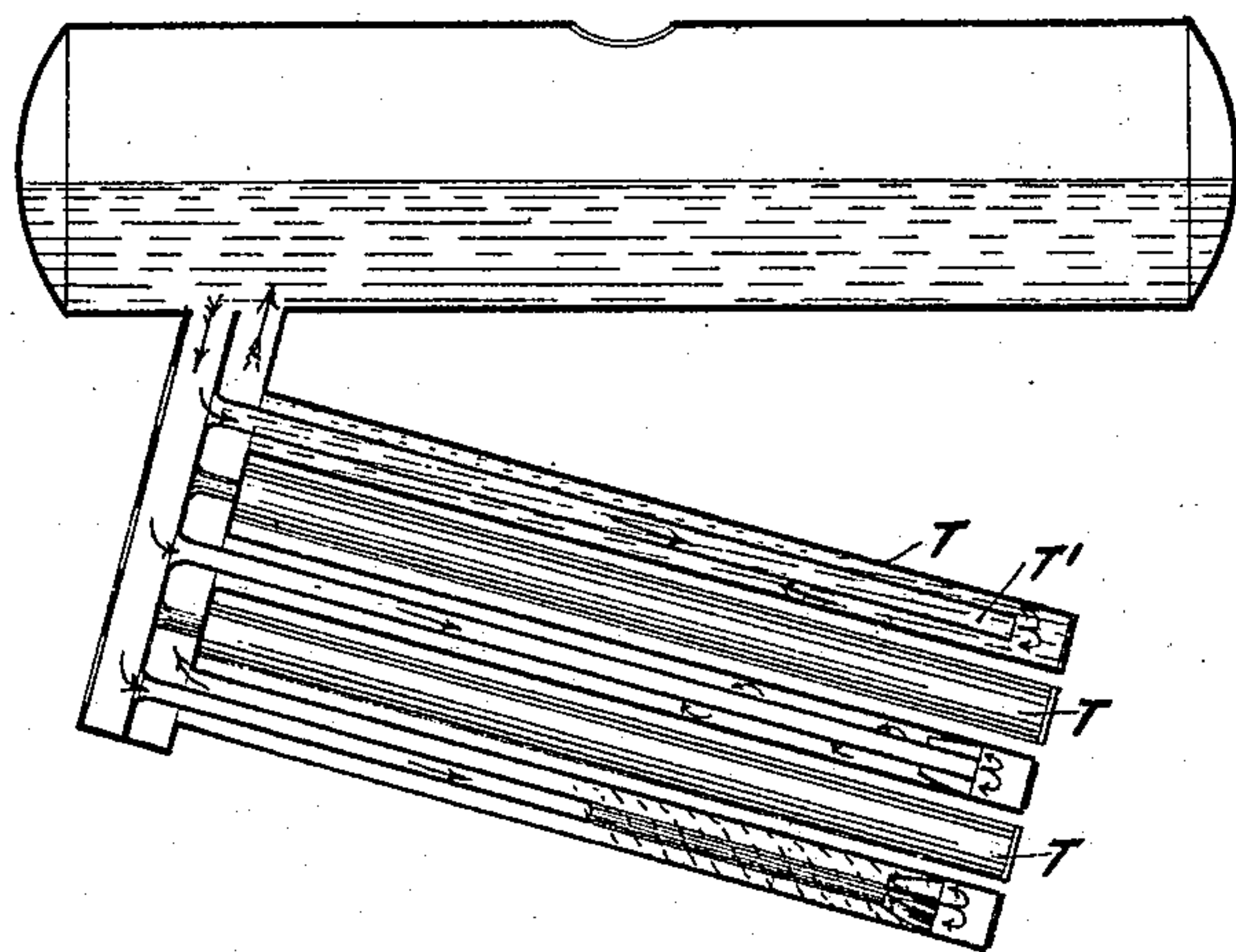


FIG. 8.

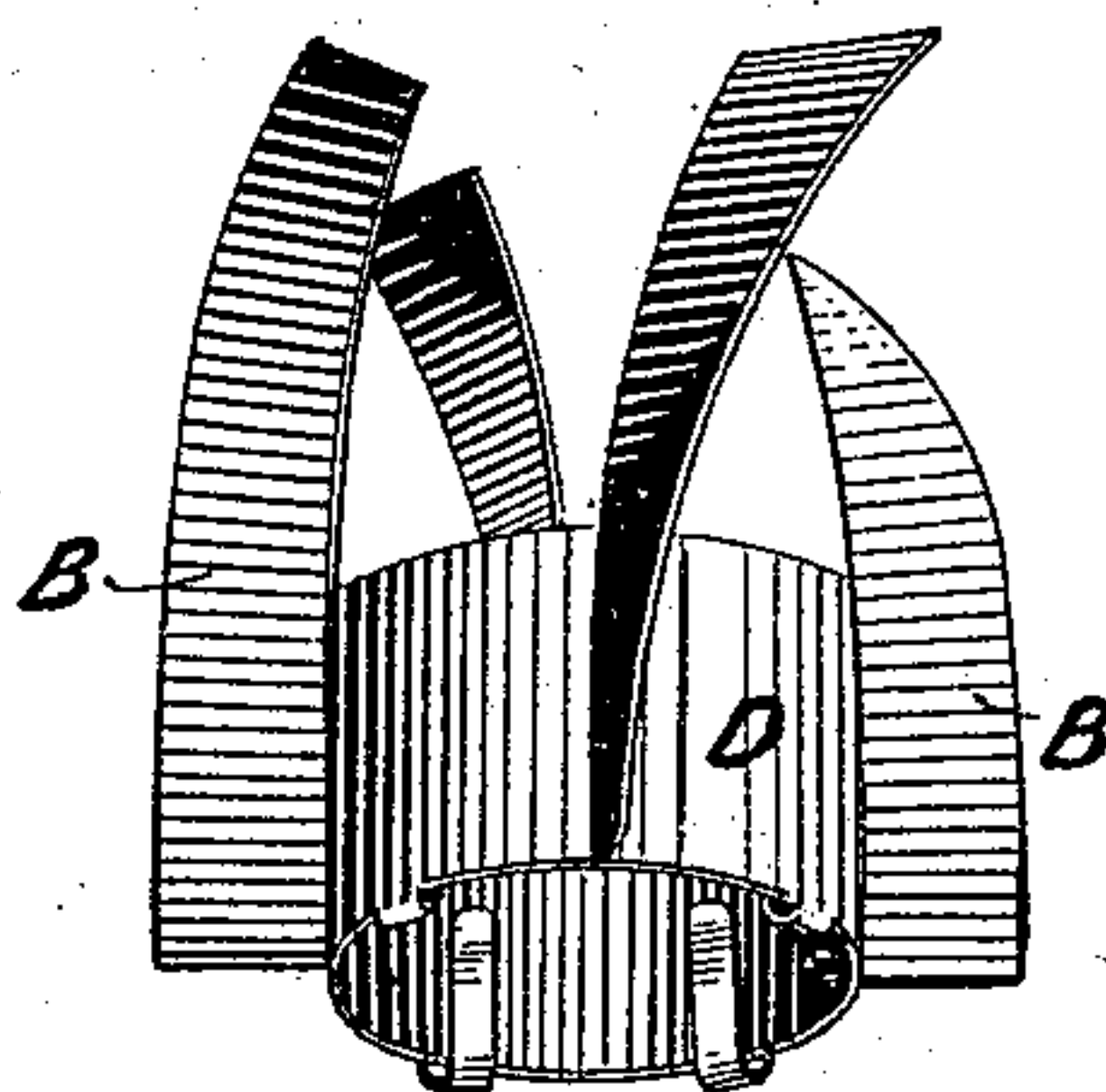


FIG. 6.

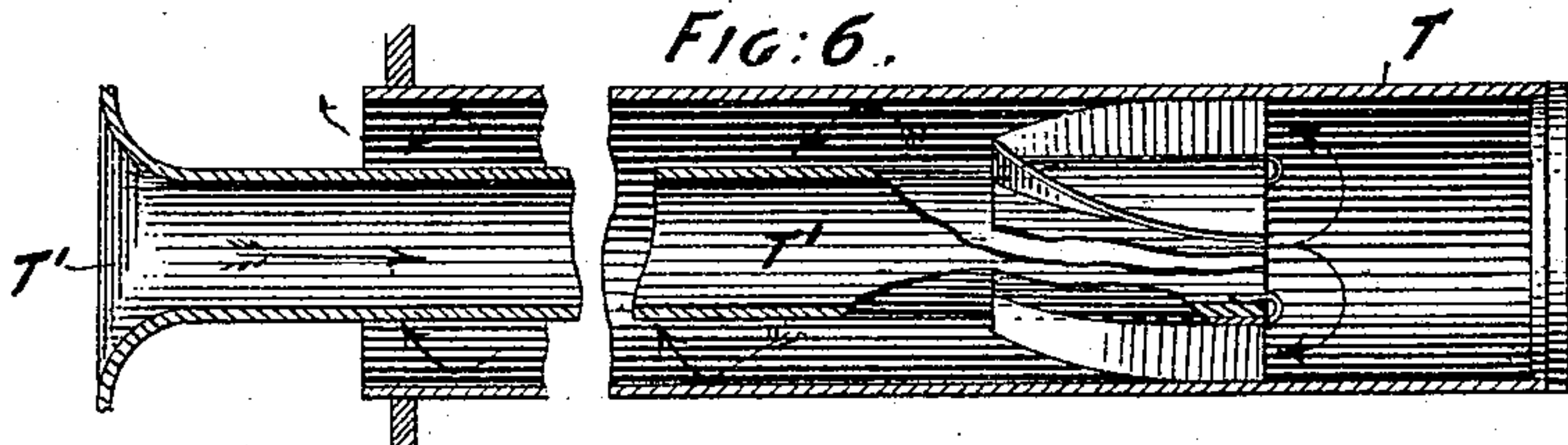
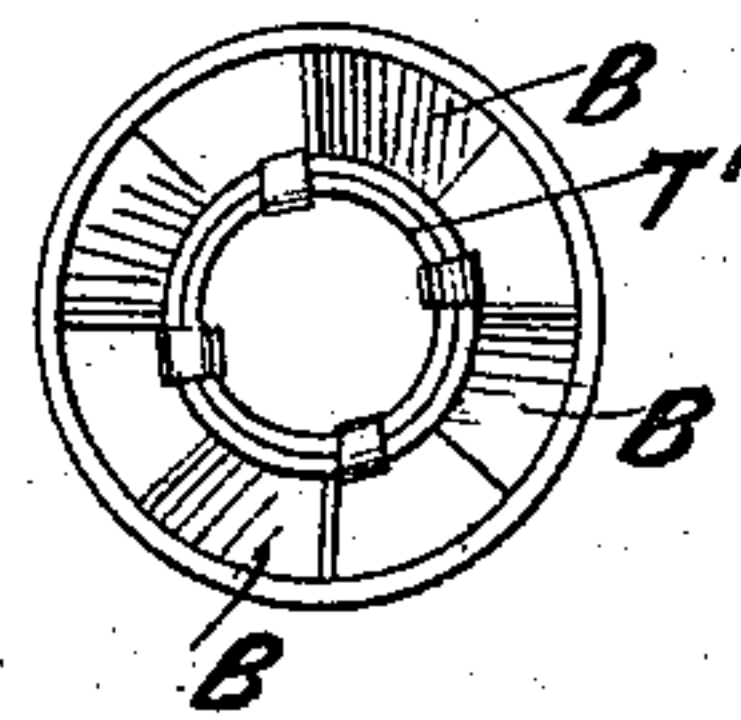


FIG. 7.



Witnesses:
John R. Wilson.
Rey C. Bowen.

Inventor:
Gabriel Zahikian
By *Whitman & Milkenam,*
Attorneys.

UNITED STATES PATENT OFFICE.

GABRIEL ZAHIKIAN, OF LONDON, ENGLAND.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 518,016, dated April 10, 1894.

Application filed May 22, 1893. Serial No. 475,033. (No model.)

To all whom it may concern:

Be it known that I, GABRIEL ZAHIKIAN, a subject of the Emperor of Russia, residing at London, England, have invented certain new and useful Improvements in Steam-Generators; 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 improvements in steam generators, and it consists of certain novel features hereinafter described and claimed.

Reference is had to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1. represents a central longitudinal section of a boiler of ordinary construction provided with my improved circulation deflecting device. Fig. 2 represents an enlarged section of one of the water tubes shown in Fig. 1. Fig. 3. represents a front view of one of the said tubes showing the circulation deflecting device fitted therein. Fig. 4 represents an enlarged perspective view of the device detached from the tubes. Fig. 5 represents a central longitudinal section of a boiler of well known construction, having double tubes fitted with my improved circulation deflecting device. Fig. 6 represents an enlarged sectional view of the ends of said double tubes fitted with my improved device. Fig. 7 represents an end view of the said tubes showing the device in position; and Fig. 8 represents an enlarged perspective view of the form of device used with double tubes as shown in Figs. 5, 6, and 7.

In the water inlet end of each tube T, a deflecting device is inserted of such a shape as to cause the water to enter in a helicoidal direction. This is accomplished by means of the device shown in detail in Fig. 4 in which there are a plurality of gradually curved wings or blades B connected together centrally as at G, and provided with slips C adapted to engage the interior of the projecting ends of the tubes, as shown in Fig. 2. Where double tubes are used as shown at T

and T' in Figs. 5 and 6 the clips C may be replaced by a ring D, as shown in Fig. 8, the said ring being adapted to slip over the outer end of the inner tube; and the curved blades B fit snugly in the annular space between the two tubes and not only impart a helicoidal direction to the water, but also serve to steady and center the otherwise unsupported end of the inner tube. This ring D is provided with inward projecting clips to prevent the motion of the water from dragging the deflecting device along the tubes G, it being important that it should be at the water inlet end of the tube exposed to the heat of the furnace. The flow of the water in the boiler is indicated in each case by the arrows. The function of this deflecting device placed at the water inlet end of the tube is to cause the fluid to enter in a vertical or helicoidal direction, the heavier particles of water are thrown outward by centrifugal action, while the lighter particles of steam seek the center of the water like chips and foam in a whirlpool. The result of this action is to keep the water to be evaporated next the heating surface and to keep the steam away therefrom, the steam thus finds a passage upward along a line approximating the axis of the tube exposed to the fire. In this way the maximum heating effect is obtained and the tubes are protected against overheating and strain. It will be obvious that a similar device might be applied to the inlet ends of horizontal or vertical tubes through which there is a flow of water.

I claim as new—

In a steam generator of the character described, the combination with a water tube receiving water at one end, and discharging it wholly or partly evaporated at the other end, of a device consisting essentially of a plurality of helicoidal blades set transversely in said tube, and clips adapted to engage said tube and hold said device in position, substantially as described.

GABRIEL ZAHIKIAN.

Witnesses:

FREDERIC PRINCE,
WILLIAM MUIR.