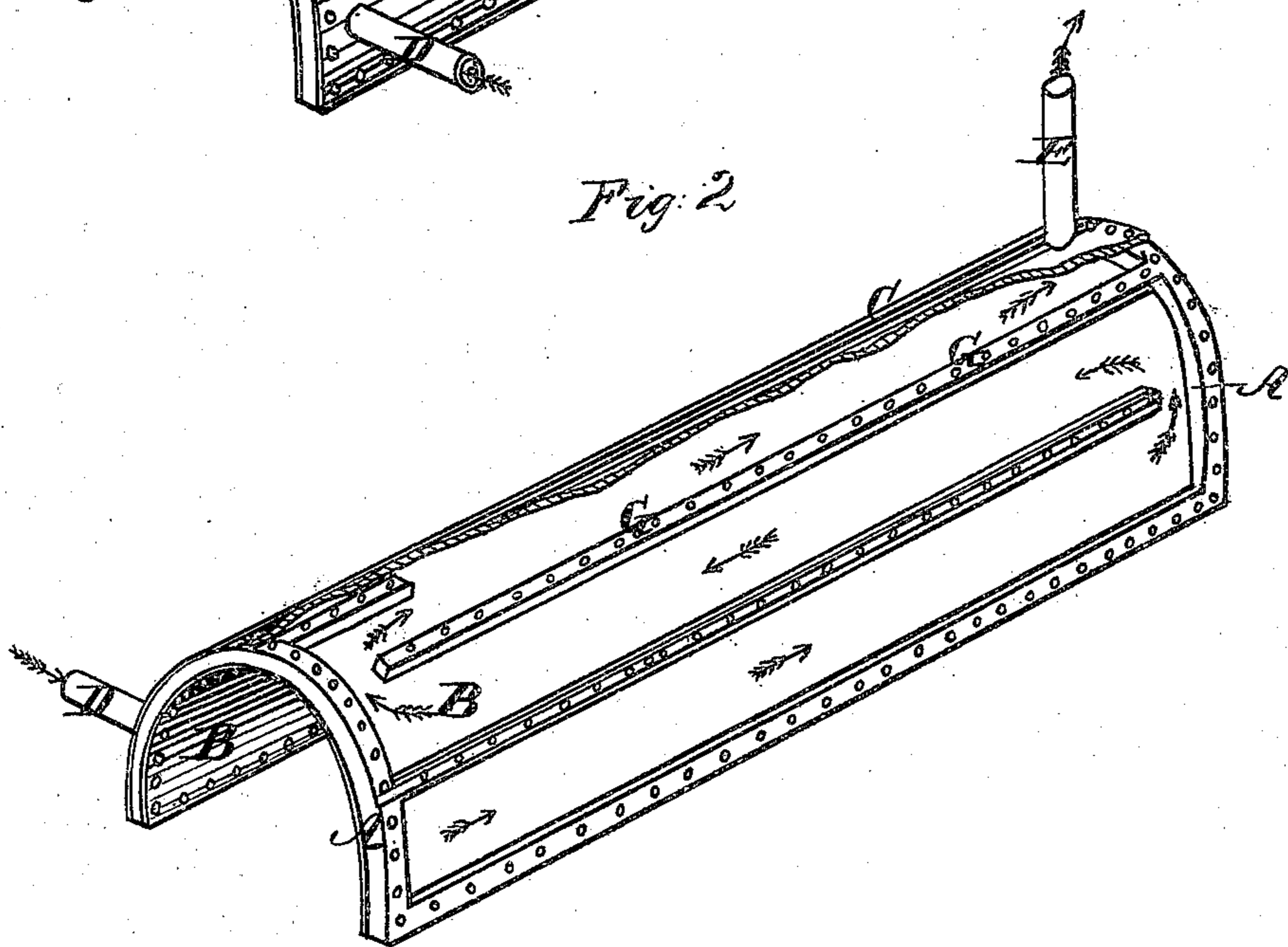
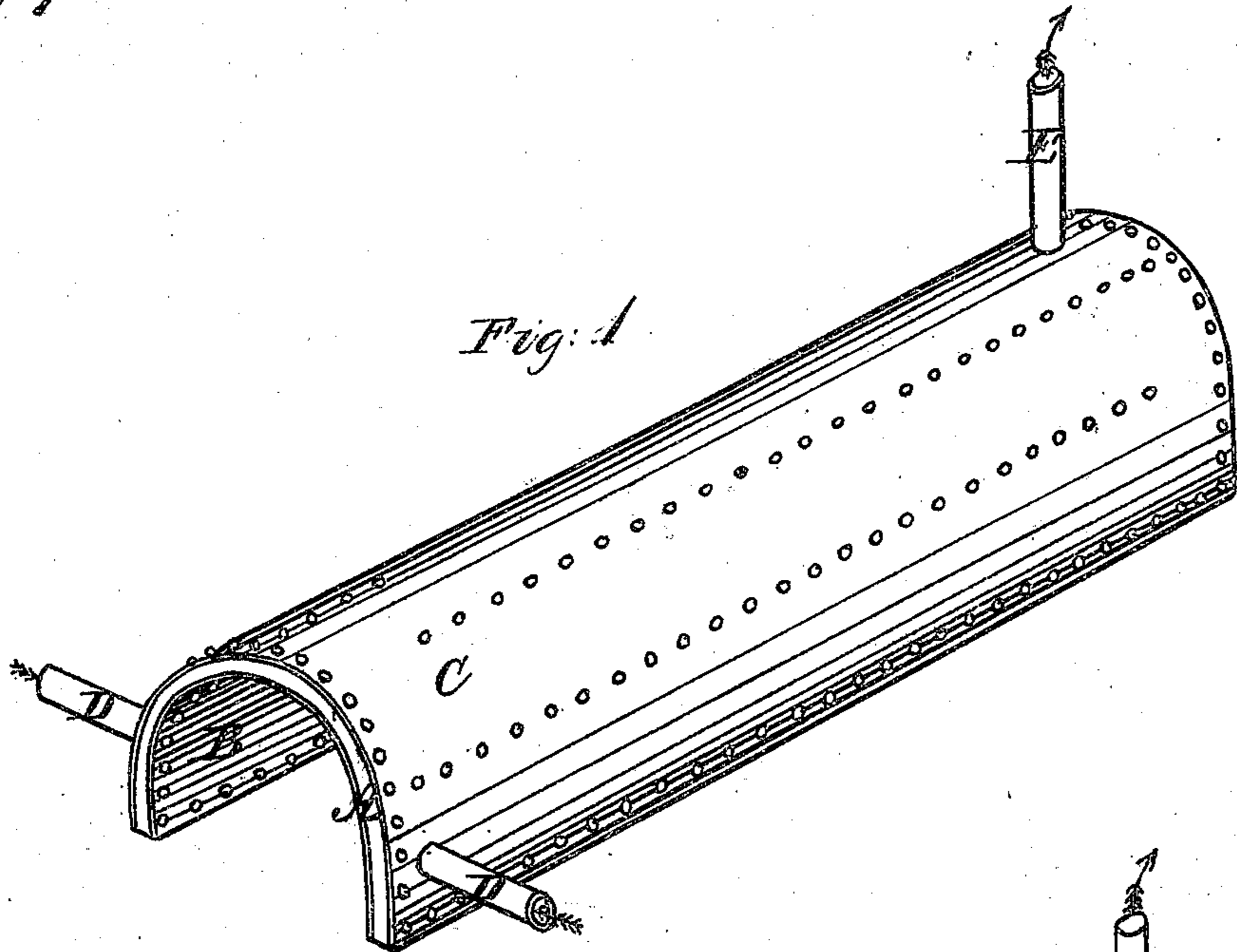


W. B. Mack.

Steam Generator.

N<sup>o</sup> 97305.

Patented Nov. 30. 1869.



Witnesses;

A. M. H.

R. Schuchman

Inventor;

William B. Mack

# United States Patent Office.

WILLIAM B. MACK, OF DETROIT, MICHIGAN.

Letters Patent No. 97,305, dated November 30, 1869; antedated November 11, 1869.

## IMPROVEMENT IN STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same.

I, WILLIAM B. MACK, of the city of Detroit, in the county of Wayne, and in the State of Michigan, have invented a "Circulator-Attachment to Steam-Boilers," of which the following is a specification.

My invention relates to that class of steam-generators in which the fire is applied directly to a secondary chamber, between which and the main chamber a circulation is kept up by suitably-arranged connections, as hereinafter shown; and

The invention consists in constructing this secondary chamber or circulator-attachment in such a way that the water is made to pursue a circuitous route in passing from the inlet-pipe or pipes to the eduction or return-pipe, by means of divisional bars, which separate the space between the upper and lower sheets in the circulator-chamber into communicating compartments, substantially as shown in the drawing, and which, at the same time, serve as stays or supports for strengthening the structure.

### *Description of the Accompanying Drawings.*

Figure 1 represents the circulator-attachment when completed and put together.

Figure 2 represents the sectional view of the circulator, showing the current of water passing through the circulator.

### *General Description.*

The circulator is in semi-cylindrical form, and the

fire to heat the water passing through the circulator is to be built within the cavity of its arch.

A are the angle-irons, which enclose and unite the two sheets, B and C, at their outer edges.

B is the inside, and C the outside plate or casing of the circulator.

D are the pipes by which the water is introduced from the boiler to the circulator.

E represents the pipe or tube by which the water, after having passed through the circulator, is again returned to the boiler.

G are the bars or stays, which are closely fitted, by rivets, between B and C, and around which the water circulates, as shown by arrows in fig. 2.

It will be necessary to make the plate or sheeting B much heavier, stronger, and of better material than plate or sheeting C.

### *Claim.*

I claim, as my invention—

The circulator-attachment above described, the inner space of which is divided into communicating compartments by the divisional bars or stays, for the purpose of causing the water to circulate backward and forward, in its passage from the inlet-pipe or pipes to the delivery-pipe, substantially as shown.

Witnesses:

A. H. SMITH,  
O. KIRCHNER.

WILLIAM B. MACK.