

J. Woodruff.
Steam Generator.

N^o 64929.

Patented May 21, 1867.

Fig: 1.

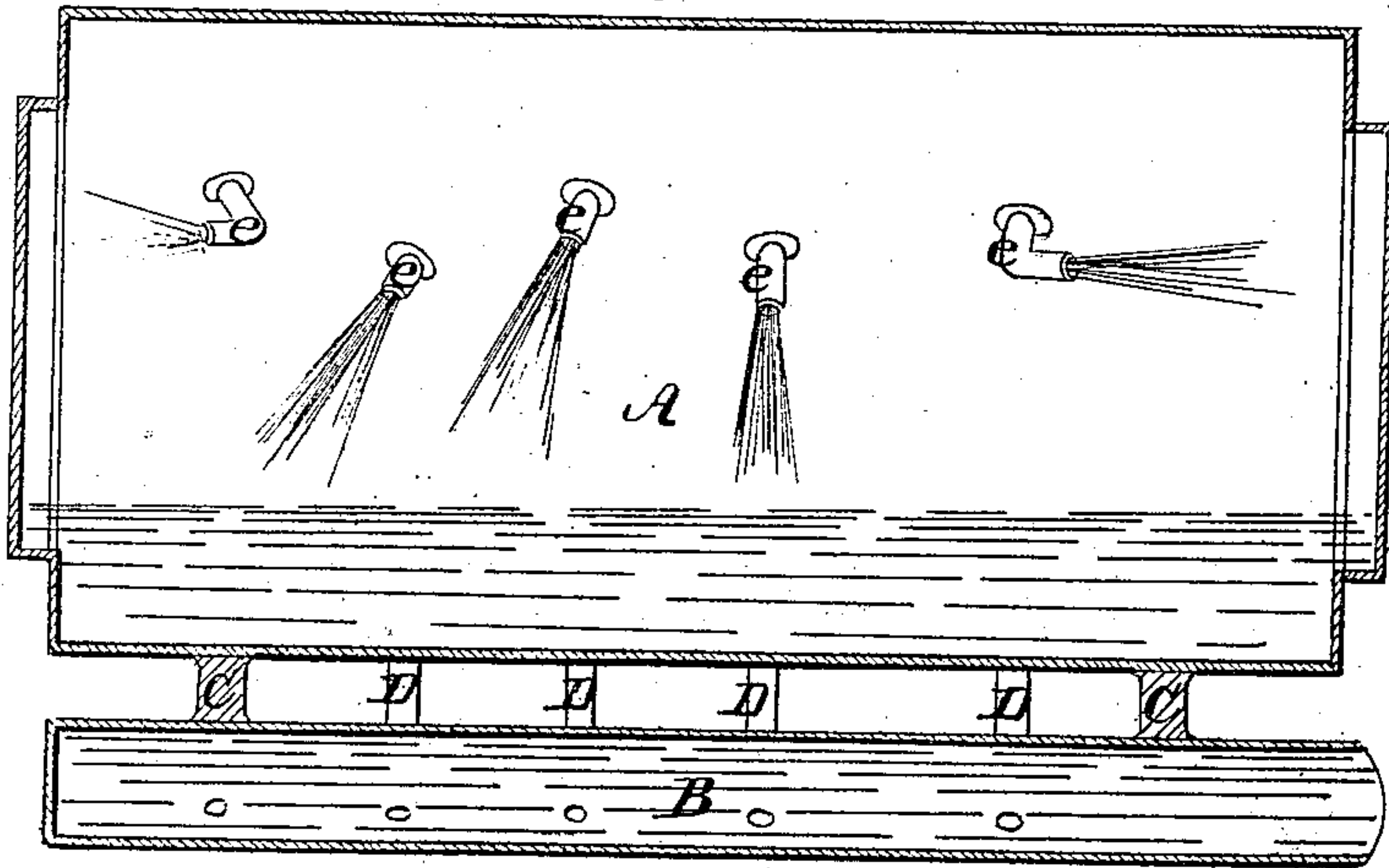


Fig: 2.

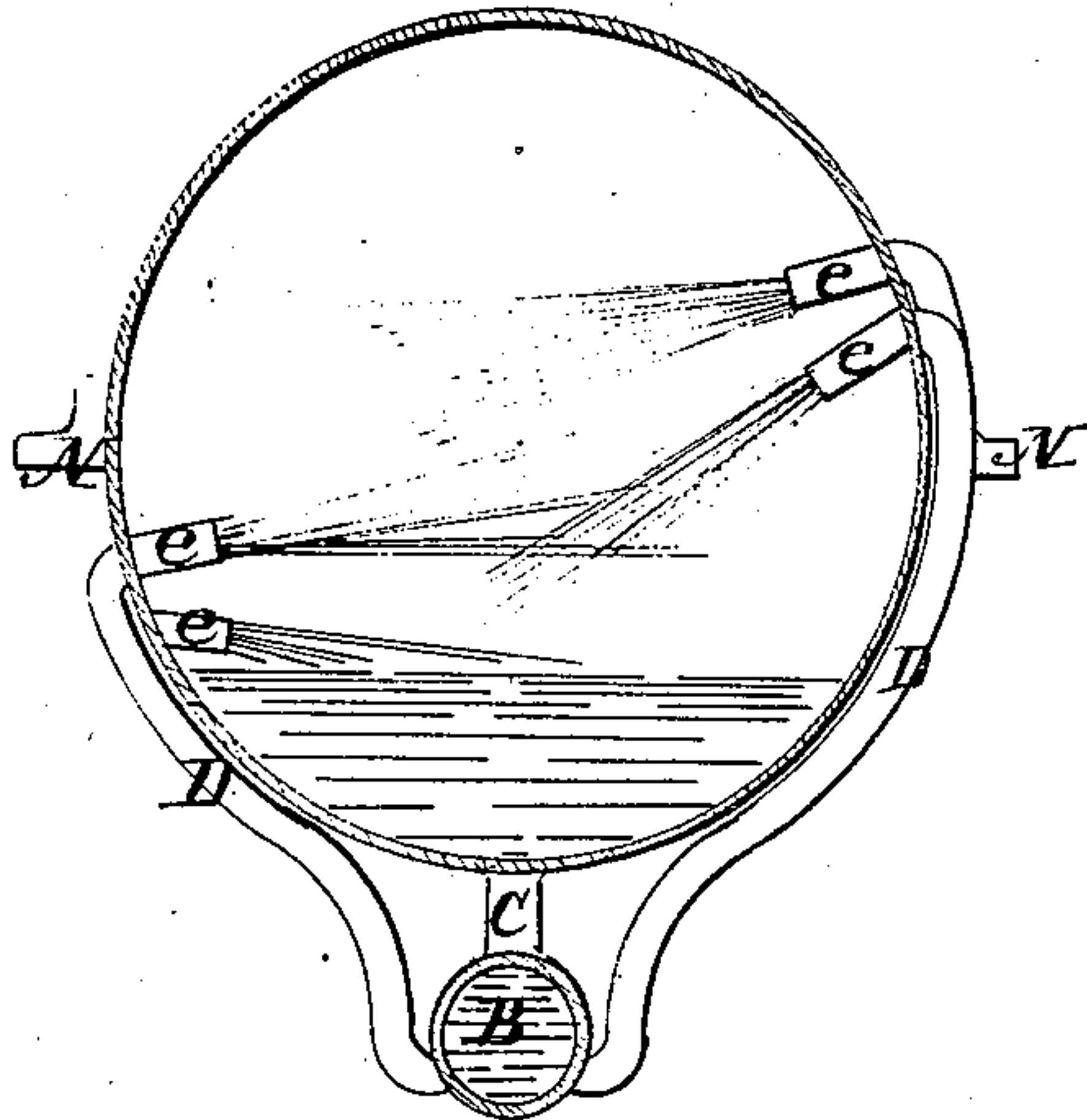
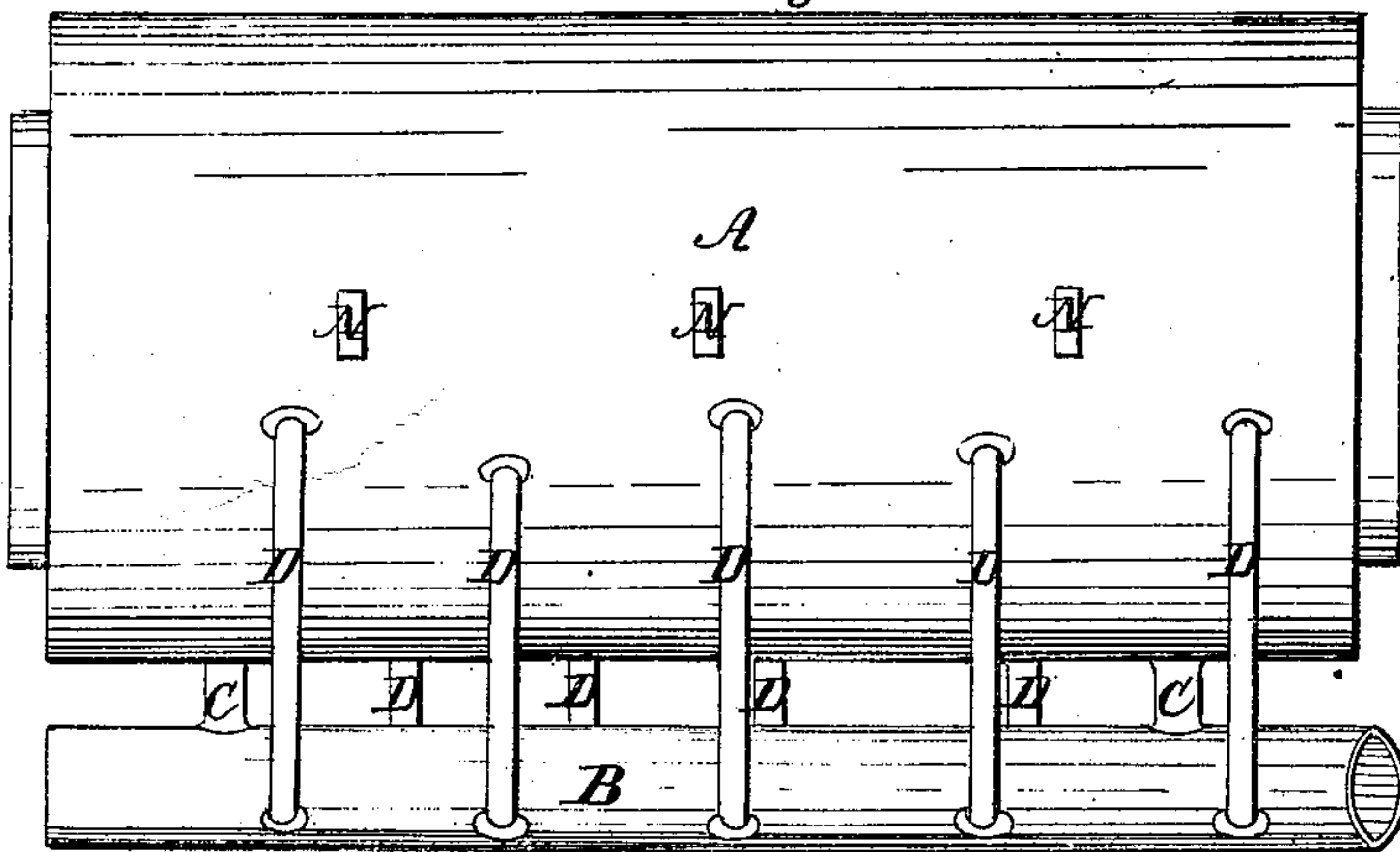


Fig: 3.



Inventor;
Joseph Woodruff.

United States Patent Office.

JOSEPH WOODRUFF, OF RAHWAY, NEW JERSEY.

Letters Patent No. 64,929, dated May 21, 1867.

IMPROVEMENT IN STEAM GENERATORS.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOSEPH WOODRUFF, of the city of Rahway, in the county of Union, and State of New Jersey, have invented a new and improved Steam Boiler; and I do hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, and the letters and figures marked thereon.

The nature of my invention consists in connecting two cylindrical boilers together in such a manner by tubes as to cause a strong circulation of water from one to the other, thereby causing a greater amount of steam to be generated by the fuel used, and at the same time securing greater safety from explosion.

To enable others skilled in the art of making and using steam boilers to make and use my invention, I will describe its construction and operation. In the accompanying drawings—

Figure 1 is a vertical longitudinal section.

Figure 2 is a vertical cross-section; and

Figure 3 an elevation of fig. 1.

A A, figs. 1 and 3, is the main boiler, made in the usual manner, and fitted with the usual flues, if desired. B B is the auxiliary or small boiler attached to the main boiler by the necks C C. The tubes D D, having a calibre of about two inches, are let into the boiler A at their upper ends, and into the boiler B at their lower ends. In boiler A they terminate in a nozzle, as shown at E E, &c. Also the tubes D D, &c., are bent in the manner shown, or in such a manner as to prevent by their "spring" the loosening of the joints by unequal expansion or contraction. The boiler is set in the usual manner, the large boiler being supported by the lugs N, &c., resting on the brick-work of the setting, the lower or small boiler being suspended under it by the pipes and necks above described. The grate-bars are placed below the lower boiler in the usual manner.

The operation is as follows: The boiler being filled to the usual height with water, and the fire being lighted immediately, the water in the small boiler and the pipes D, &c., becomes heated, and an upward current is established through the pipes D D, while a downward one is established through the necks C C. As the temperature increases the current increases with it, and when steam begins to be generated the current becomes violent, causing a strong jet from the nozzles E E. These nozzles are permanently fixed to the pipes and deflected in different directions for the purpose of directing jets, that if the water in the boiler should by accident get low, the jets impinge on the more exposed plates of the boiler and prevent them from being overheated, thereby preventing damage to the boiler or a destructive explosion.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The connection of two boilers by means of the pipes D D, substantially as described.
2. I also claim extending the tubes D D or nozzles into the boiler and bending or deflecting the same, for the purposes substantially as set forth and described.

JOSEPH WOODRUFF.

Witnesses:

A. C. PIERSON,

C. L. WOODRUFF.