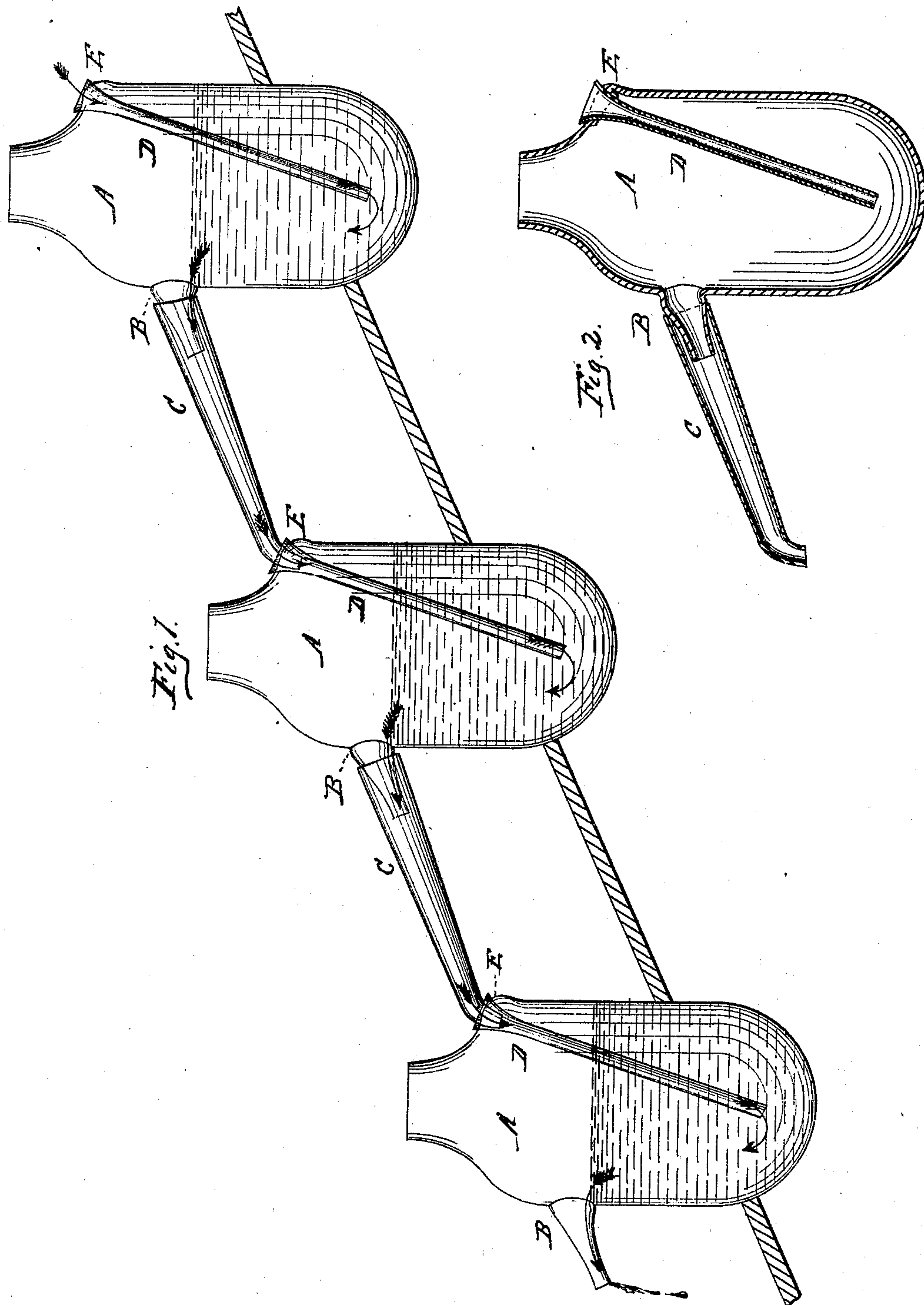


J. SAUNDERS.

RETORTS FOR CONCENTRATING SULPHURIC ACID.

No. 171,049.

Patented Dec. 14, 1875.



Witnesses;  
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# UNITED STATES PATENT OFFICE.

JOSEPH SAUNDERS, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN RETORTS FOR CONCENTRATING SULPHURIC ACID.

Specification forming part of Letters Patent No. **171,049**, dated December 14, 1875; application filed November 10, 1875.

*To all whom it may concern :*

Be it known that I, JOSEPH SAUNDERS, of Brooklyn, New York, have invented new and useful Improvements in Retorts for Concentrating Sulphuric Acid ; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a bench of three retorts, and Fig. 2 is a vertical section through one of them, as well as through its receiving-funnel and the adjustable tube connecting the retorts.

This invention relates to glass retorts and their connections, used in concentrating sulphuric acid by a continuous process ; and consists in constructing them with an aperture on one side having a smooth finish and inwardly-turned edges, and with a short spout or nipple on the other of even, or nearly even, thickness of the side of the retort at the place of connection ; and also in providing an adjustable tube to connect the spout of one retort with the funnel in the one next adjoining, as hereinafter described.

As is well known, a very extensive and expensive apparatus is required to manufacture sulphuric acid on a large scale for commercial purposes. Important parts of the apparatus are the retorts for concentrating the acid. These were formerly made of platinum, as it was found that the acid, as it became strong, would attack and destroy any baser metal. As the platinum retorts were very expensive, Mr. I. D. Perrin and myself invented a glass retort for the purpose, and obtained a Patent, No. 78,760, dated June 9, 1868, for the same. This was made by first being blown to its full size, and, when cooled sufficiently to keep its shape, by having a spout from fifteen to eighteen inches long, or long enough to connect it with the next retort, attached on one side, and a wolf's-neck aperture on the other. To produce a spout of this length about two pounds of hot glass are stuck on at the proper place and then blown and drawn out. In operating upon such a large mass of glass under these conditions the result is that the glass of the pipe is from five to ten times as thick as the glass of the retort. This difference in thickness makes the expansion of the two dif-

ferent, and causes a cracking of the retort around the point of connection, when the pipe falls off. The wolf's-neck aperture was also attached by first sticking on a quantity of red-hot glass, and then blowing and drawing it out. As uniform thickness could not be produced, a breaking or cracking of the retort would sometimes be caused by the unequal expansion of the parts about the connection of this wolf's-neck.

Another serious objection to the retorts thus constructed is the great care required in handling or packing them for transportation, as the long spout and wolf's-neck were liable to be broken off. To overcome these objections is the object of my improvements.

A retort, A, is first blown to the desired size and form, and then, after it has cooled sufficiently to retain its shape, the flame of a hydrogen blow-pipe is applied to the point where the spout is to be attached. This point or part of the retort is kept at a white heat while two or three ounces of melted glass are put on and drawn out into a spout or nipple, B, some four or five inches in length, as shown in both figures. In operating upon the glass under these conditions the spout is made of the same, or nearly the same, thickness as the side of the retort to which it is attached, as clearly shown in Fig. 2. On the side of the retort opposite to that to which the spout is attached an aperture, E, is made by first applying the flame of the hydrogen blow-pipe until the glass is of a white heat, and then perforating it with a wooden stick. In doing this the edges of the aperture are turned inwardly, as clearly shown in Fig. 2, and a smooth finish is given to the opening.

A retort thus constructed may be safely handled and used, or packed and transported. When a series of these retorts are set up and employed in the process of concentrating the acid, as shown in Fig. 1, a glass funnel, D, is inserted through the aperture E of all of them, with its lower end extending nearly to the bottom of each, as shown. To connect them, glass tubes C are provided, shaped at one end so as to be adjustable on the nipple B, and slightly contracted and curved at the other for insertion into the funnels D, as shown in Fig. 1. These loose adjustable tubes are

found to be of great convenience in the manipulation of the retorts, and a necessary part of the apparatus. The process carried on by means of these retorts, with the funnels and adjustable tubes, is the same as that shown in Patent No. 78,760, June 9, 1868, above referred to.

Having thus described my invention, what I claim is—

1. A glass retort for concentrating sulphuric acid, having a spout or nipple, B, of the same thickness at the point of its attachment as the side of the retort to which it is attached, and an

aperture, E, with inwardly-turned edges and smooth finish, as and for the purpose set forth.

2. In combination with the retorts A and funnels D, the adjustable tubes C, for connecting a series of retorts in the process of concentrating sulphuric acid, as set forth.

The above specification of said invention signed and witnessed at Brooklyn this 8th day of November, A. D. 1875.

JOSEPH SAUNDERS.

Witnesses:

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