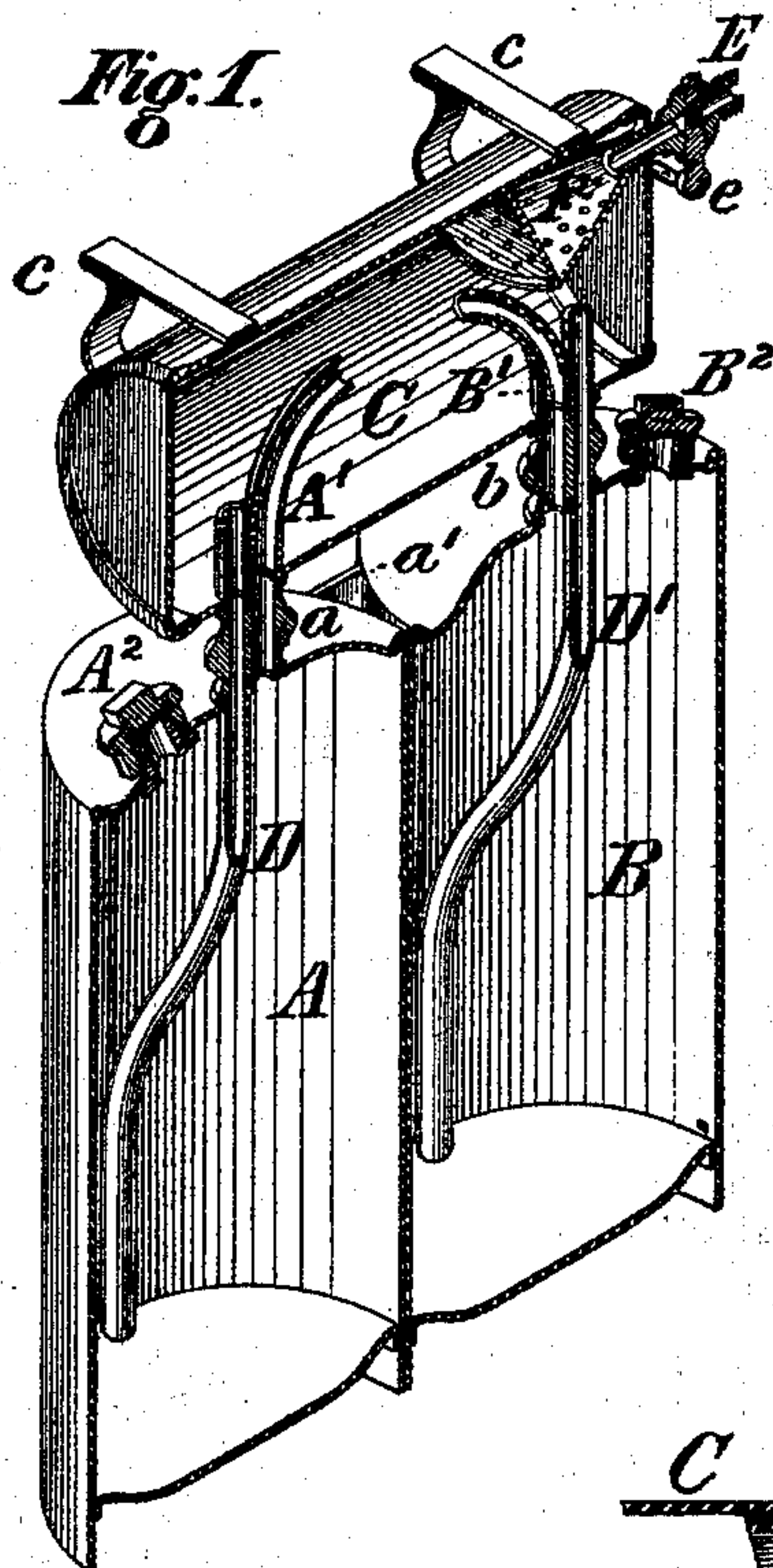


**D. B. WAGGENER & J. H. BREED.**  
**Fire-Extinguishers.**

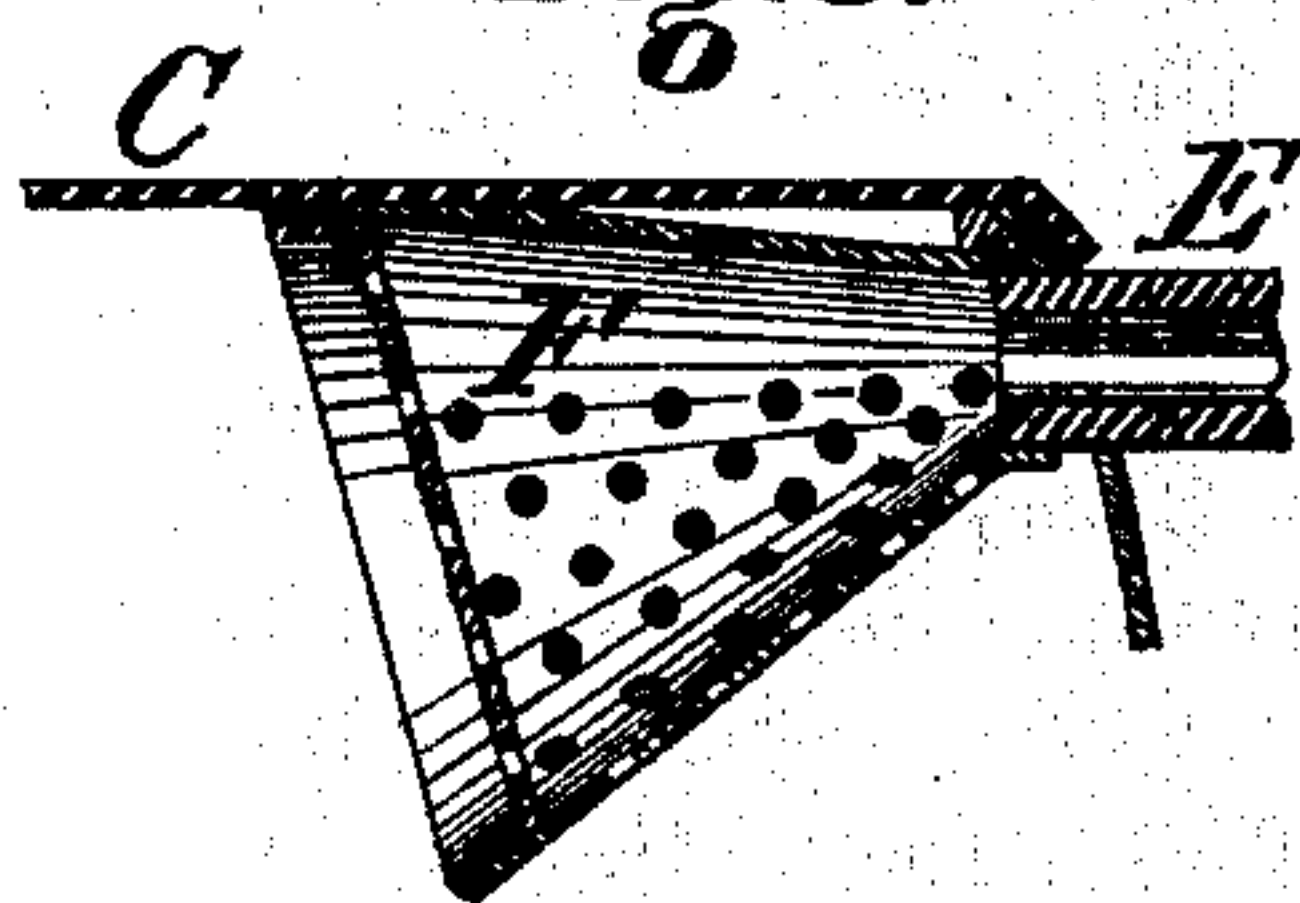
No. 146,790.

Patented Jan. 27, 1874.

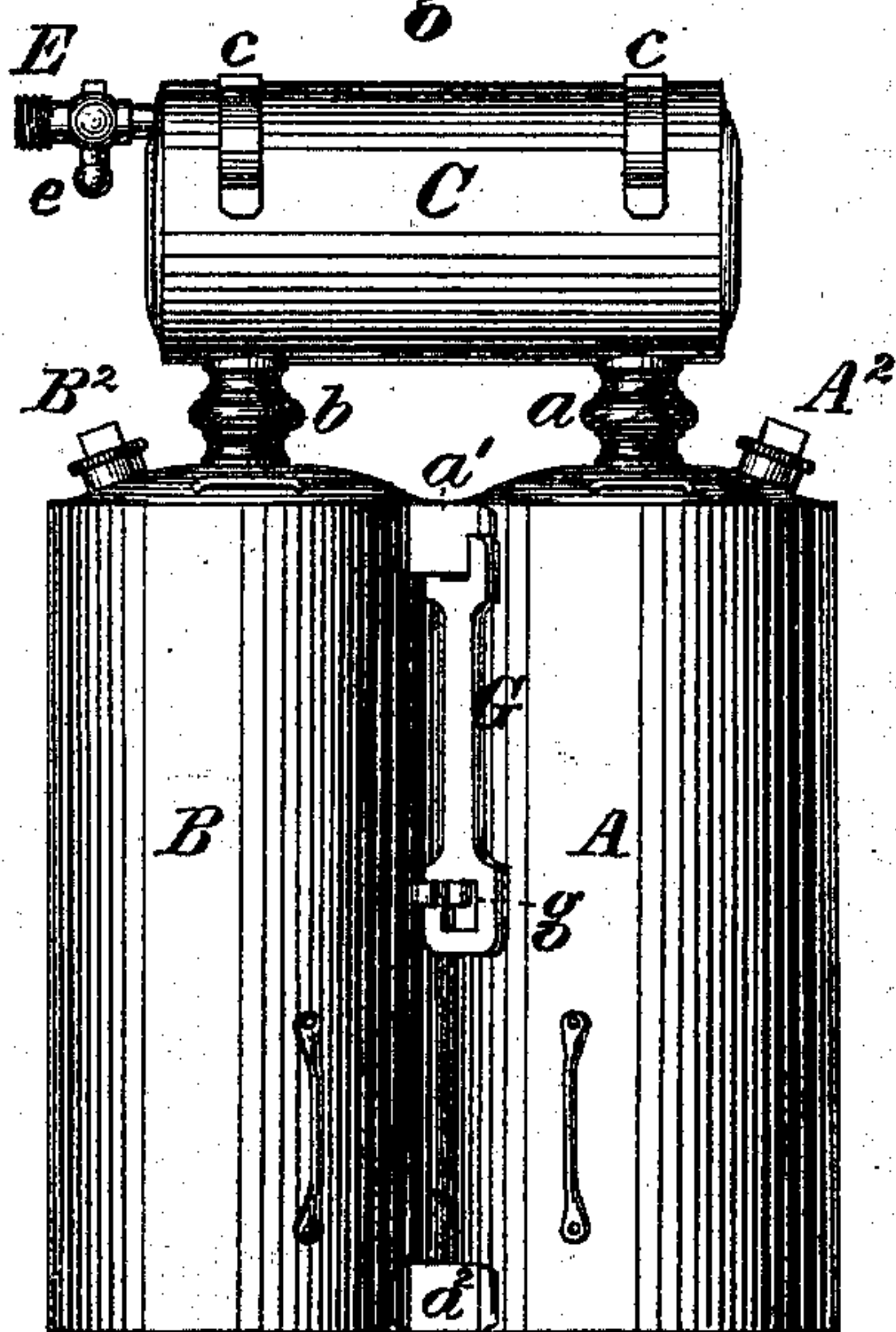
*Fig. 1.*



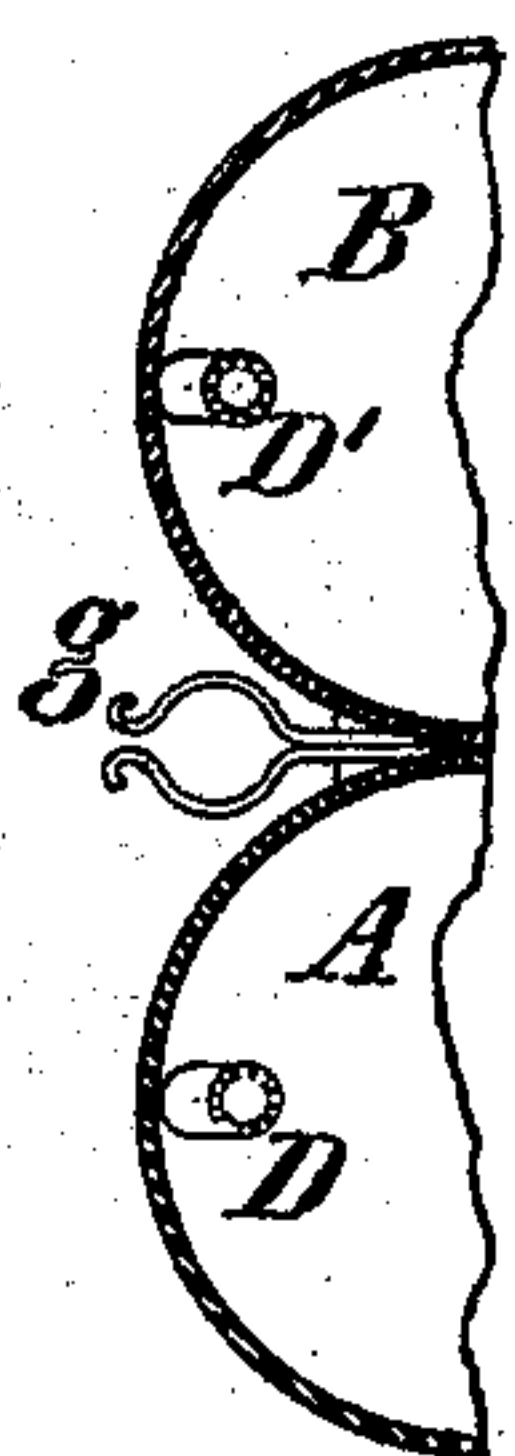
*Fig. 3.*



*Fig. 2.*



*Fig. 4.*



*Witnesses.*

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN FIRE-EXTINGUISHERS.

Specification forming part of Letters Patent No. **146,790**, dated January 27, 1874; application filed December 23, 1873.

*To all whom it may concern:*

Be it known that we, DANIEL B. WAGGENER and JOHN HOWARD BREED, both of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Fire-Extinguishers, of which the following is a specification:

The object of our invention is to simplify, as far as practicable, the construction of fire-extinguishers, and at the same time to provide all necessary means for the immediate and thorough commingling of the acid and alkaline solutions, the ejection of the liquid and gaseous mixture upon the fire, the purging of the apparatus of the liquid that may remain in the generating-chamber after its operation is concluded, and the prevention of its return to the acid and alkaline chambers; to which ends our improvements consist, first, in connecting the acid and alkaline chambers with the generating-chamber by open curved water-ways extending into the generating-chamber, and having their vents directed toward each other and above the bottom line of said chamber; and, second, in a peculiar construction of the strainer attached to the discharge-pipe, by which we are enabled to discharge all, or nearly all, the liquid in the generating-chamber by the pressure of the gas, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is an isometrical section of a fire-extinguisher embodying our improvements; Fig. 2, a view in elevation of the same; Fig. 3, a section, on an enlarged scale, of the strainer, which is connected to the discharge-pipe; and Fig. 4, a partial horizontal section of the acid and alkaline chambers, showing the springs for holding the wrench.

To carry out the objects of our invention, we provide an acid-chamber, A, and an alkaline-chamber, B, made, preferably, of cylindrical form, and for the purpose of containing, respectively, suitable acid and alkaline solutions, which chambers are placed side by side, and united by upper and lower braces  $a^1 a^2$ . The acid and alkaline chambers are connected, by short necks  $a b$ , to a generating-chamber, C, which we usually place above and at right angles to them. They are charged through nozzles, which are closed by screw-caps  $A^2 B^2$ .

Open water-ways  $A^1 B^1$  are formed in the necks  $a$  and  $b$ , which water-ways are extended into the generating-chamber, and curved toward each other, so that their vents shall be in the upper portion of the generating-chamber—say, at a distance of about one-third of its diameter from the top. The water-ways should be so curved that the streams of liquid issuing therefrom shall strike each other after they escape from the water-ways, instead of impinging directly, by which arrangement there is no tendency for the flow to be impeded, and an intimate commixture of the acid and alkaline solutions is effected. By the use of the open curved water-ways we are enabled to dispense with cocks or valves in the necks  $a b$ , and correspondingly simplify the construction and operation of the apparatus, as the extension of the water-ways toward the upper portion of the generating-chamber prevents the splashing or projection of the liquids contained in the acid and alkaline chambers when the apparatus is moved about, while by simply reversing the extinguisher, so that it may stand upon the feet  $c c$ , secured to the top of the generating-chamber, or be held or carried in that position, the acid and alkaline solutions have free and immediate access to the generating-chamber.

For the purpose of allowing the gas as it is generated to enter the chambers A and B, and prevent its interference with the streams issuing therefrom, we make use of the equalizing-tubes  $D D'$ , which pass through the necks  $a$  and  $b$ , and terminate with open ends near the bottoms of the chambers A and B.

Such tubes have been heretofore known and used, but as hitherto constructed have terminated at the periphery of the generating-chamber, the result of which construction is that, when the machine is turned into its normal position when out of use, any liquid which may remain in the generating-chamber will pass into the equalizing-tubes, and have a tendency to clog them up by the crystallization of the neutral salts which it contains.

In our improved fire-extinguisher we extend the equalizing-tubes into the generating-chamber such a distance as may be amply sufficient to prevent such a result—in this instance, say, about one-third of its diameter—by which it



will be obvious that the desired end is perfectly attained.

The stream of combined gas and water is projected from the generating-chamber upon the fire through the discharge-pipe E, which has a threaded end for the attachment of a hose, and is provided with a cock or valve, *e*, by which it is opened or closed, as required. For the double purpose of preventing the access of any solid matters to the discharge-pipe, as well as to purge the generating-chamber of the liquid therein, we provide a strainer, F, which is suitably secured to the inner end of the discharge-pipe.

As hitherto constructed, the strainer has been a simple cup or casing, perforated throughout, and not attached to the generating-chamber.

Our improved strainer is a funnel-shaped vessel, with closed top, conforming in shape toward its inner end to the periphery of the generating-chamber, to which it is properly secured, and sloping downward to meet the mouth of the discharge-pipe, to which it is soldered or otherwise suitably attached, being perforated with numerous small holes throughout its whole extent, except on that portion of its surface which abuts against the periphery of the generating-chamber and extends to the mouth of the discharge-pipe, and for a distance equal to the distance from the inner top line of the chamber to the lower inner line of the discharge-pipe, or thereabout, as shown in Fig. 3.

As the discharge-pipe cannot be set close to the inner surface of the periphery of the chamber, owing to the space required for soldering and flanging of the head, there has always hitherto been sufficient space for a quantity of liquid to rest in, and which cannot be expelled from the chamber. In the use of our improvement, the pressure of the gas will drive all, or practically all, the liquid into the strainer, which, not being perforated above the discharge-pipe, will cause the same to be expelled therefrom.

The screw-caps A<sup>2</sup> B<sup>2</sup> are turned by means of a wrench, G, which is usually made with open spaces in each of its ends, one of which is closed all around, and the other open at one side. For the purpose of affording convenient attachment for the wrench when not in use, we provide clamping-springs *g g*, which are secured, each at one end, upon the periphery of

one or both of the chambers A and B, and have their free ends slightly apart, so that one end of the wrench may be slipped between them, the other being held by one of the braces which unite the chambers, as shown in Fig. 2. The wrench is thus safely supported and retained in a position where it is most conveniently ready for use.

A single spring might be used, instead of two, as shown; but we deem the arrangement described to be preferable.

In the operation of the machine, it is simply necessary to invert it, as before stated, and upon opening the cock *e* the stream of liquid will be projected upon the fire.

We are aware that the Letters Patent granted to Joseph Gardner, No. 124,565, dated March 12, 1872, show a fire-extinguisher in which an elbow-pipe extends from the acid-chamber into the generating-chamber, and is bent downward directly over the opening connecting the same with the alkaline-chamber, its object being to clear the soda-cock of any superfluous soda; but such an arrangement differs essentially from ours, inasmuch as cocks or valves are employed, and are necessary in the necks uniting the chambers; and, further, that the two solutions are caused to impinge directly against each other as they issue from the acid and alkaline chambers, both of which conditions our improvements are designed to and do prevent.

We distinctly disclaim such a device, neither do we broadly claim a strainer or equalizing-tubes; but

What we do claim is—

1. In a fire-extinguisher, the combination of an acid-chamber, an alkaline-chamber, and a generating-chamber, to which they are connected by curved water-ways open throughout their entire length, and each giving vent into the generating-chamber above its bottom line, substantially as set forth.

2. In a fire-extinguisher, the combination, with the generating-chamber, of the strainer F secured to its periphery, and perforated at all points, except on its upper surface, between the periphery of the generating-chamber and the discharge-pipe, substantially as set forth.

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Witnesses:

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