No. 822,491. PATENTED JUNE 5, 1906.

J. C. TONKIN.

ELASTIC FLUID GENERATOR.

APPLICATION FILED MAR. 3, 1905.

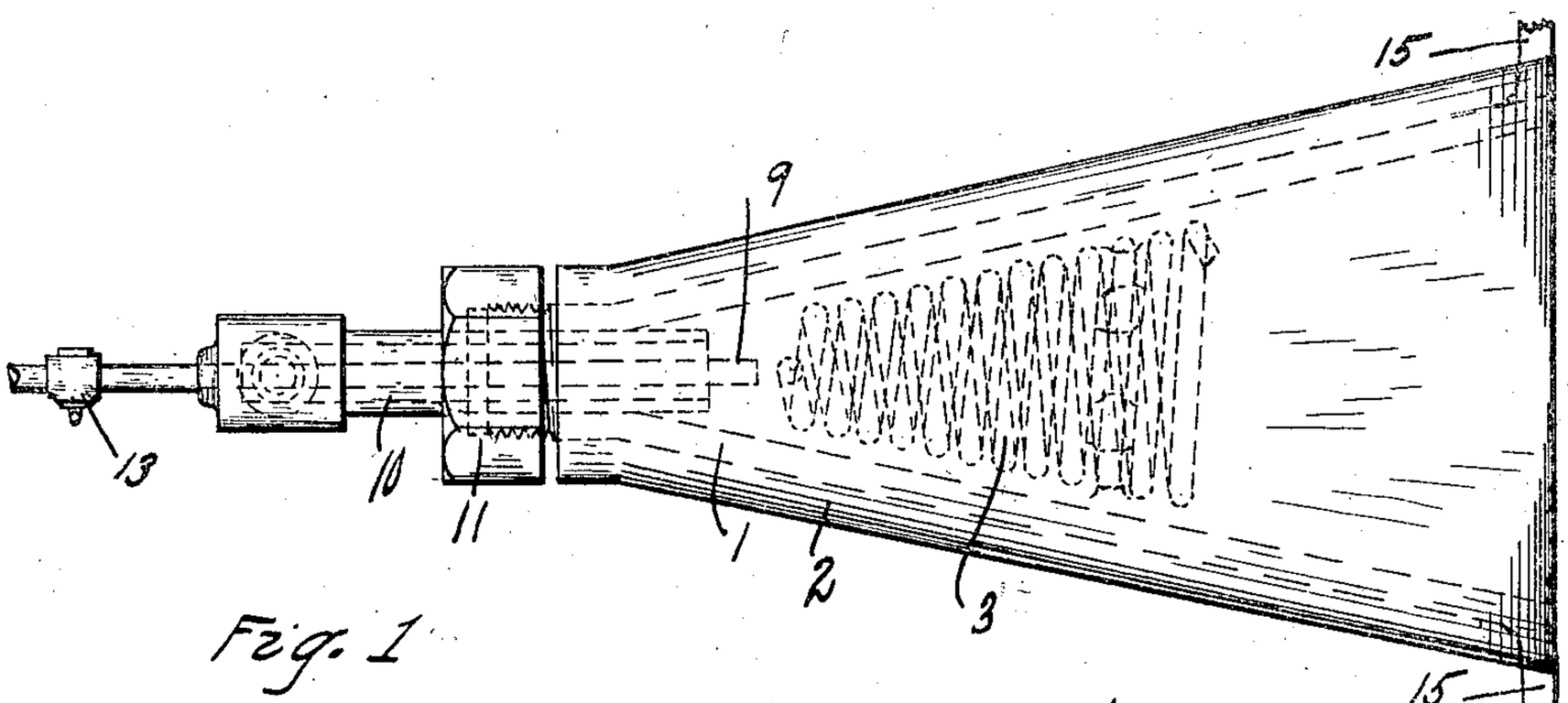

Fig. 1

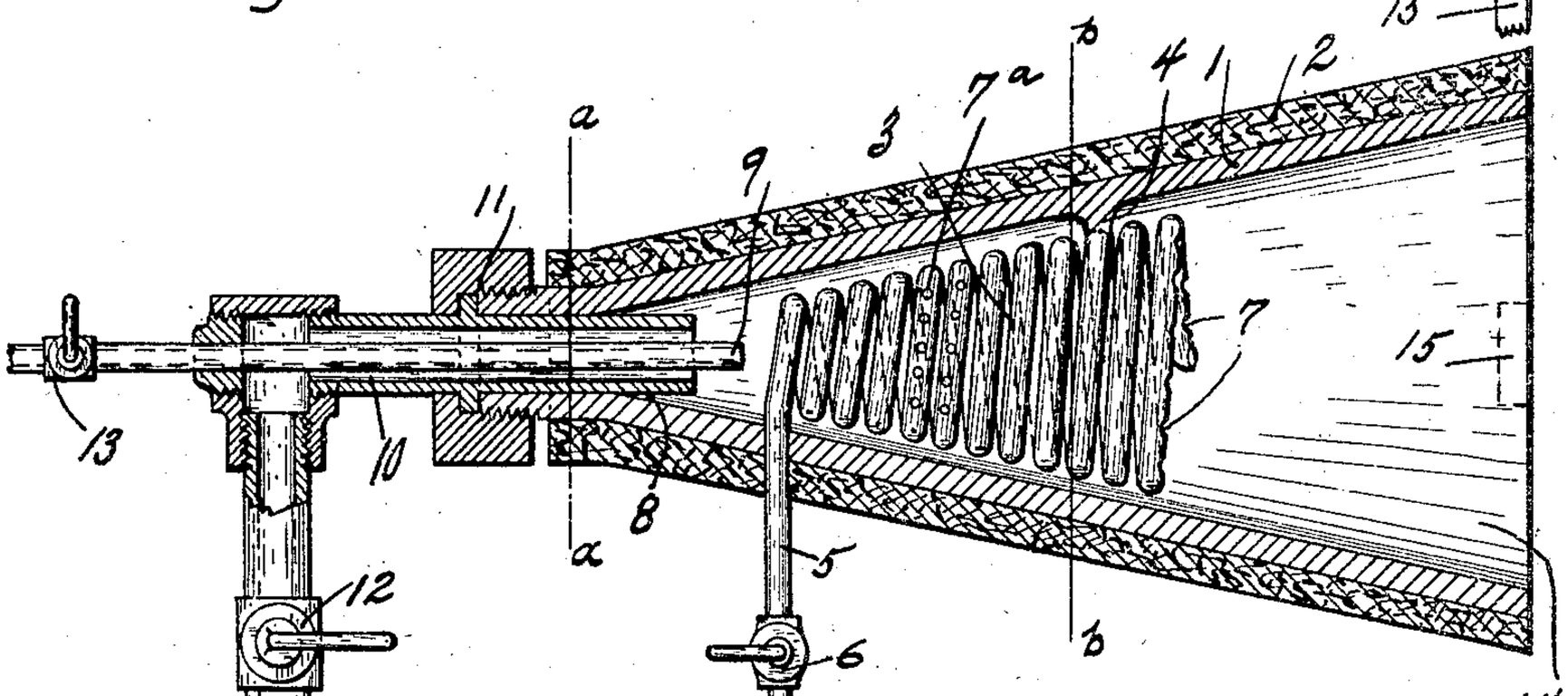

Fig. 2

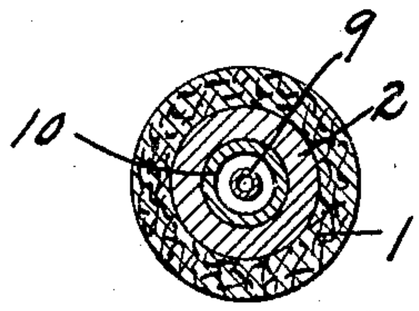

Fig. 3

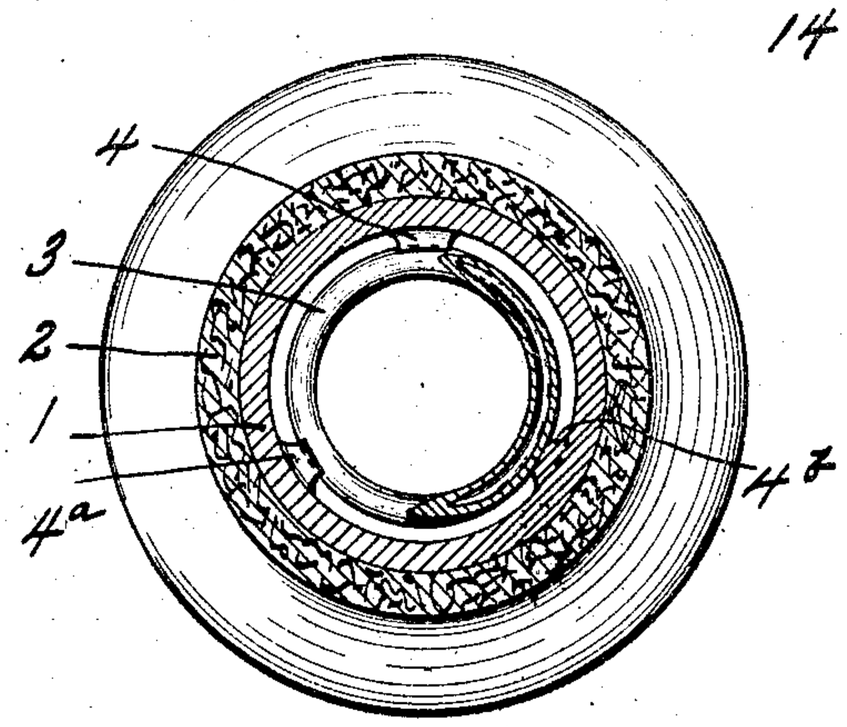

Fig. 4

Witnesses
Robert K. Perkins
Louis von Grawe.

Inventor
John C. Tonkin
by Warren E. Willis.
Attorney

UNITED STATES PATENT OFFICE.

JOHN C. TONKIN, OF GLASSBORO, NEW JERSEY, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-HALF TO THOMAS J. FERRELL, OF GLASSBORO, NEW JERSEY.

ELASTIC-FLUID GENERATOR.

No. 822,491. Specification of Letters Patent. Patented June 5, 1906.

Application filed March 3, 1905. Serial No. 248,215.

To all whom it may concern:

Be it known that I, JOHN C. TONKIN, a citizen of the United States, residing at Glassboro, in the county of Gloucester and State of New Jersey, have invented a new and useful Elastic-Fluid Generator, of which the following is a specification.

This invention relates to improvements in means for generating elastic-fluid gases.

Its objects are, first, to provide means whereby the generation of steam is effected by the combustion of gas or gaseous fluids in direct contact with water and the products of the said combustion commingled with the steam so formed; second, to provide means for the instantaneous and continuous generation of steam in the presence of an ignited air-blasted jet of liquid or gaseous fuel and the intermingling of the combined products; third, to provide a steam-generator without the use of boilers or furnaces as generally employed, instantly operatable, readily controllable, and of absolute safety.

These and other minor obvious objects are attained in the mechanisms hereinafter fully described, and shown in the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a plan view of my invention. Fig. 2 is a vertical section thereof, taken on the center line of Fig. 1. Fig. 3 is a cross-section taken on line *a a* of Fig. 2. Fig. 4 is a cross-section taken on line *b b* of Fig. 2.

Similar characters refer to similar parts throughout the various views.

In my device for raising steam I make use of a conical metallic chamber 1, preferably having a covering of non-conducting material 2, as asbestos or magnesia, and containing a helically-coiled tube 3, preferably made of drawn copper. The said tube 3 is coiled tapering to agree with the surrounding shell and is attached therein by suitable supports, as at 4, 4^a, and 4^b. Water or other fluids may enter the said coil by the inlet 5, which extends through the shell of the chamber 1, and a valve 6 is provided therein to control admission of the fluids from their source of supply.

Fine perforations 7 are provided in the convolutions of the coiled tube 3 for an outlet of its contents.

At the smaller end of the combustion-chamber 1 is an opening 8, adapted to receive the tubular burner 9, which is arranged to make use of any gaseous or fluid combustible in connection with a current of compressed air which surrounds the inlet 9, as indicated at 10. The said burners are held in their proper position in the combustion-chamber by the locking device 11 or other similar means.

In the rear of the burner are provided valves 12 and 13, arranged, respectively, on the air and fuel inlets and which are suitably connected to their sources of supply. The said burner 9 is so located with respect to the chamber and its inclosed coil that the flame is directed through the coil, which partially takes up its heat.

The remainder of the heat is taken up by the spray of water issuing from the holes in the coil, which spray is instantly flashed into steam in the chamber, from whence it is directed to any suitable working mechanism through the opening 14 at the larger end of the chamber.

Means are provided, as at 15, for attachment to such mechanisms, which may be in the form of a steam-turbine or other approved motor.

I may make use of a single burner or a plurality of burners using any convenient combustible as fuel, the said burners having nozzles adapted to conduct the flame and hot gases to the interior of the coil.

As an alternative form of construction I may make use of openings in the exterior of the coils, as at 7^a, allowing small quantities of water to pass from the coils and spread over the heated inner surface of a combustion-chamber.

I do not wish to confine myself strictly to the exact construction shown, but may vary therefrom without departing from the general scope and spirit of this invention—as, for instance, I may so arrange and adapt my burners as to use a dry fuel in place of a gaseous or fluid combustible.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a device of the class described, the combination with a combustion-chamber, having a constantly-increasing cross-section, of burners therein adapted to direct their

heat toward the larger end and of means for spraying water radially toward the heat, said means disposed circumferentially within the combustion-chamber and in close proximity to the walls thereof, all substantially as shown and described.

2. In a device of the class described, the combination with an inclosing combustion-chamber adapted to contain that, of a coiled tube secured therein, an inlet thereto and perforated outlets therefrom; of a burner or burners, detachably connected to the said combustion-chamber at one end thereof and entering therein registering with the interior of the said coiled tube, and an outlet from the said chamber, all substantially as shown and described.

3. In a device of the class described, the combination with a combustion-chamber provided with a non-conducting covering, of tubes secured therein, an inlet leading to and connecting with the said tubes, perforated outlets leading from the said tubes, a burner detachably connected to the said combustion-chamber and adapted to deliver its heat on the water issuing from the perforations in the said tubes, suitable feed-pipes leading to the said burner and means of control thereof, all substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN C. TONKIN.

Witnesses:

LOUIS VON GRAEVE,

ROBERT K. PERKINS.