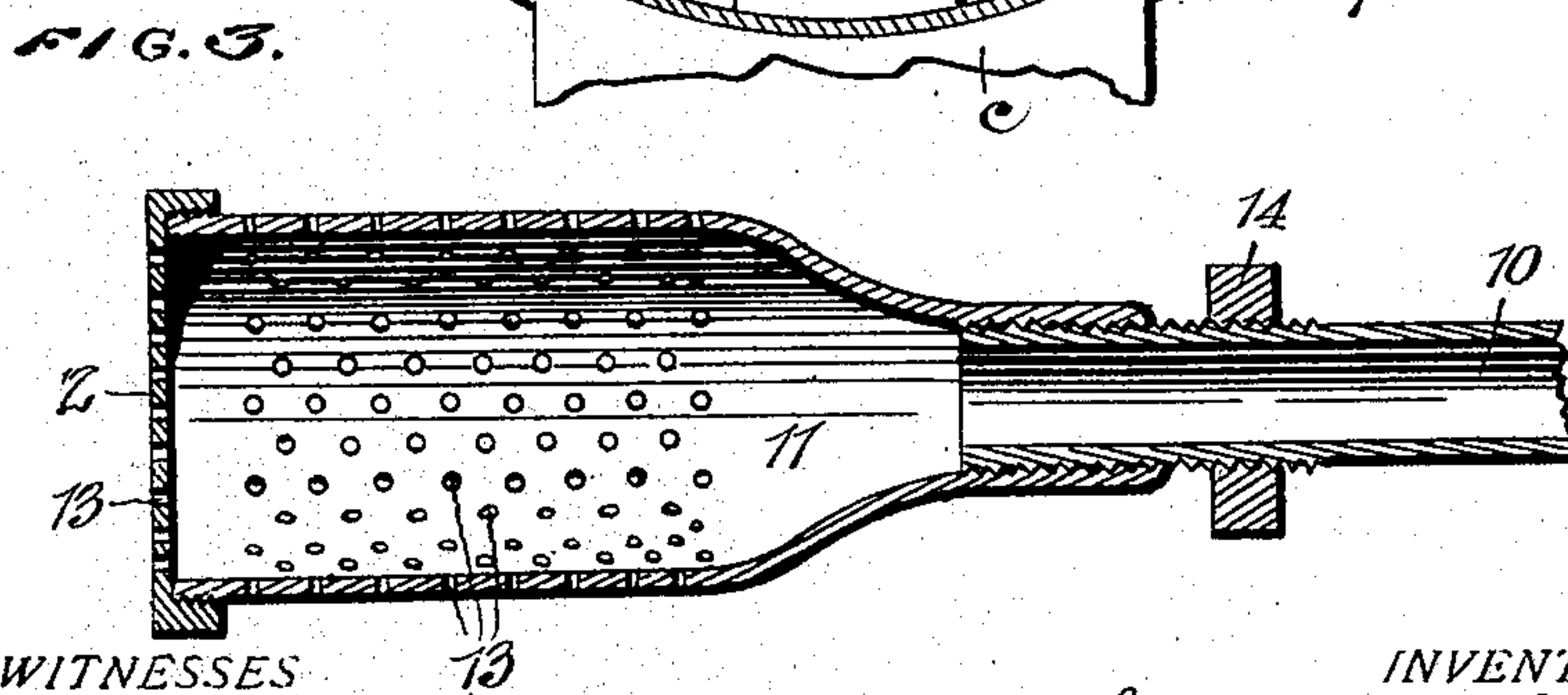
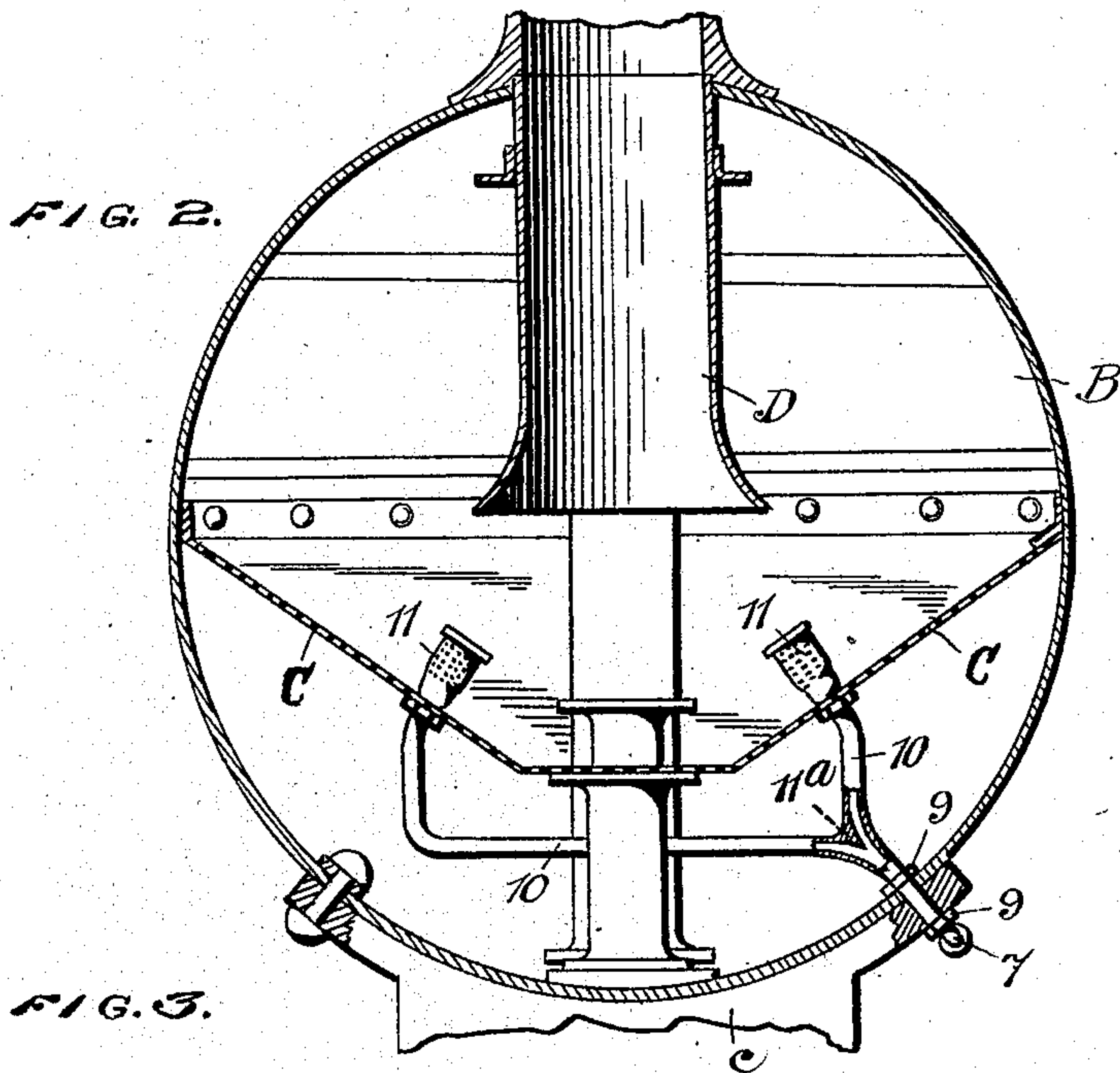
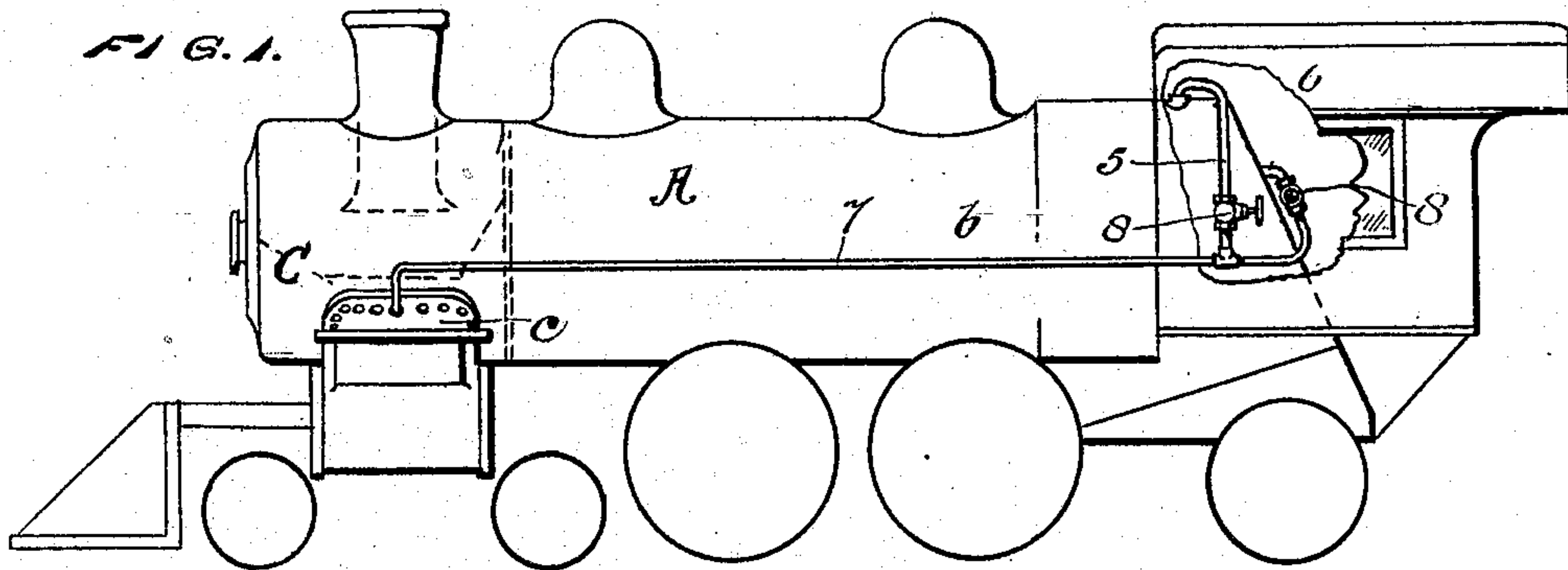


G. Z. GRAY.
SMOKE AND SPARK DESTROYER.
APPLICATION FILED APR. 17, 1908.

911,817.

Patented Feb. 9, 1909.



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GEORGE Z. GRAY, OF HARRISBURG, PENNSYLVANIA.

SMOKE AND SPARK DESTROYER.

No. 911,817.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed April 17, 1908. Serial No. 427,643.

To all whom it may concern:

Be it known that I, GEORGE Z. GRAY, a citizen of the United States, residing at Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Smoke and Spark Destroyers, of which the following is a specification.

My invention relates to smoke and spark preventers, and more particularly to that class of preventers used in connection with locomotives of the extended smoke-box type, and the object thereof is to provide a novel smoke and spark preventing mixture, together with a simple and inexpensive, yet highly efficient apparatus for withdrawing the components thereof from their respective sources and conveying the same to a point adjacent the point of exit, in such manner that either of the said components may be employed independent of the other, or both may be employed and thoroughly mixed during their conveyance.

Further objects and advantages of my present invention will appear in the course of the following description, in which reference is made to the accompanying drawing, forming a part of this specification, in which like numerals are used to designate like parts throughout the several figures, and in which,

Figure 1 is a side elevation of a locomotive provided with my improved apparatus, and partly broken away to show one of the sources of supply. Fig. 2 is a transverse vertical sectional view taken through the forwardly extending smoke-box of a locomotive, and centrally through the smoke-stack leading therefrom. Fig. 3 is a fragmentary central longitudinal sectional view, on an enlarged scale, taken through the spraying nozzle and a portion of the discharge pipe to which the same is connected.

In the practical embodiment of my invention, I provide an apparatus for withdrawing, conveying, mixing, and discharging a mixture of steam and hot water from the rear of the locomotive to the forward extension thereof, and spraying the same within its extended smoke-box and toward and into the internal mouth of its discharge stack.

As shown in the accompanying drawing, my apparatus comprises branch pipes 5 and 6 leading from the rear end of the boiler *b*, of a locomotive A, and from the top and adjacent the water line thereof, to respectively convey dry steam, and steam and water

therefrom, the said locomotive being of that type which are provided with a forwardly extending smoke-box B having a fixed frusto-conical netting C, therein. The branch pipes 5 and 6, leading from the steam boiler *b*, open into an elongated conveying pipe 7, leading from the cab of the locomotive within its forwardly extending smoke-box B, and said branch pipes 5 and 6 are provided with regulating valves 8, located within said locomotive cab to be under direct control of the engine men. It will thus be seen that either dry steam or steam and hot water, from the boiler *b*, may be independently employed by shutting off the valve 8 of one of the pipes 5 and 6, or they may both be employed and conveyed through the pipe 7, which is necessarily of such length that the said steam and hot water will become thoroughly mixed by the time they reach the extended smoke-box B. The forward end of the conveying pipe 7, extends within the smoke-box B, through the boiler saddle *c*, being locked therethrough by nuts 9 and an opening within said smoke-box into branch discharge pipes 10, said pipes 10 at their connection with the conveying pipe 7, having a triangular internal knife-edged projection 11^a, mounted with its knife-edge extending toward and within the conveying pipe 7, which projection 11^a is provided in order that the mixture will be more quickly divided into the discharge pipes 10, and in order that the said mixture may not be prematurely condensed or otherwise harmed by impinging against a resisting surface.

Each of the pipes 10, is provided with external threaded discharge ends projecting through the frusto-conical shaped netting C and oppositely through the inclined sides thereof, said threaded projecting ends of said pipes 10, being adapted for the reception of spraying nozzles 11, comprising enlarged tubular portions having flanged threaded caps 12 secured upon the ends thereof, said enlarged tubular portions and said caps being provided with minute openings 13, through which the mixture is sprayed. The said nozzles are preferably mounted upon a converging angle, in order to spray the mixture toward and within the internal mouth D of the smoke-stack, leading from the extended smoke-box B. The discharge pipes 10, are further provided upon their threaded ends, below their nozzles 11, and below the netting C, with nuts 14 adapted to be screwed up-

wardly thereon against the said netting C, to securely lock the pipes 10 and their nozzles 11 therethrough.

From the foregoing it will be understood
5 that the steam and water from pipe 6 are employed to prevent hot sparks, and dry steam from pipe 5 is employed to prevent smoke.

Having fully described my invention, I claim:

10 In a smoke and hot spark preventing apparatus of the character described, the combination with a locomotive provided with a forwardly extended smoke box, having a frusto-conical frame of foraminous material
15 fixed therein below the mouth of its smoke stack, of a conveying and mixing pipe extending a major portion of the length of said locomotive, a dry steam pipe and a steam
20 of said conveying pipes from the rear boiler

end of said locomotive, regulating valves within each of said boiler pipes, branch discharge pipes leading from the forward end of said conveying pipe and projecting angularly through opposite sides of said foraminous frame, perforated nozzles threadedly engaged upon the upper projecting ends of said discharge pipes above said foraminous frame, and jam nuts threadedly engaged upon said discharge pipes, below and against
30 said foraminous frame to lock said nozzles and said discharge pipes therethrough, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE Z. GRAY.

Witnesses:

SUE G. LANDIS,
MARY BENDER.