(No Model.)

E. CAPITAINE.

ATOMIZER FOR PETROLEUM GAS ENGINES.

No. 408,460. Patented Aug. 6, 1889.

Fig 2.

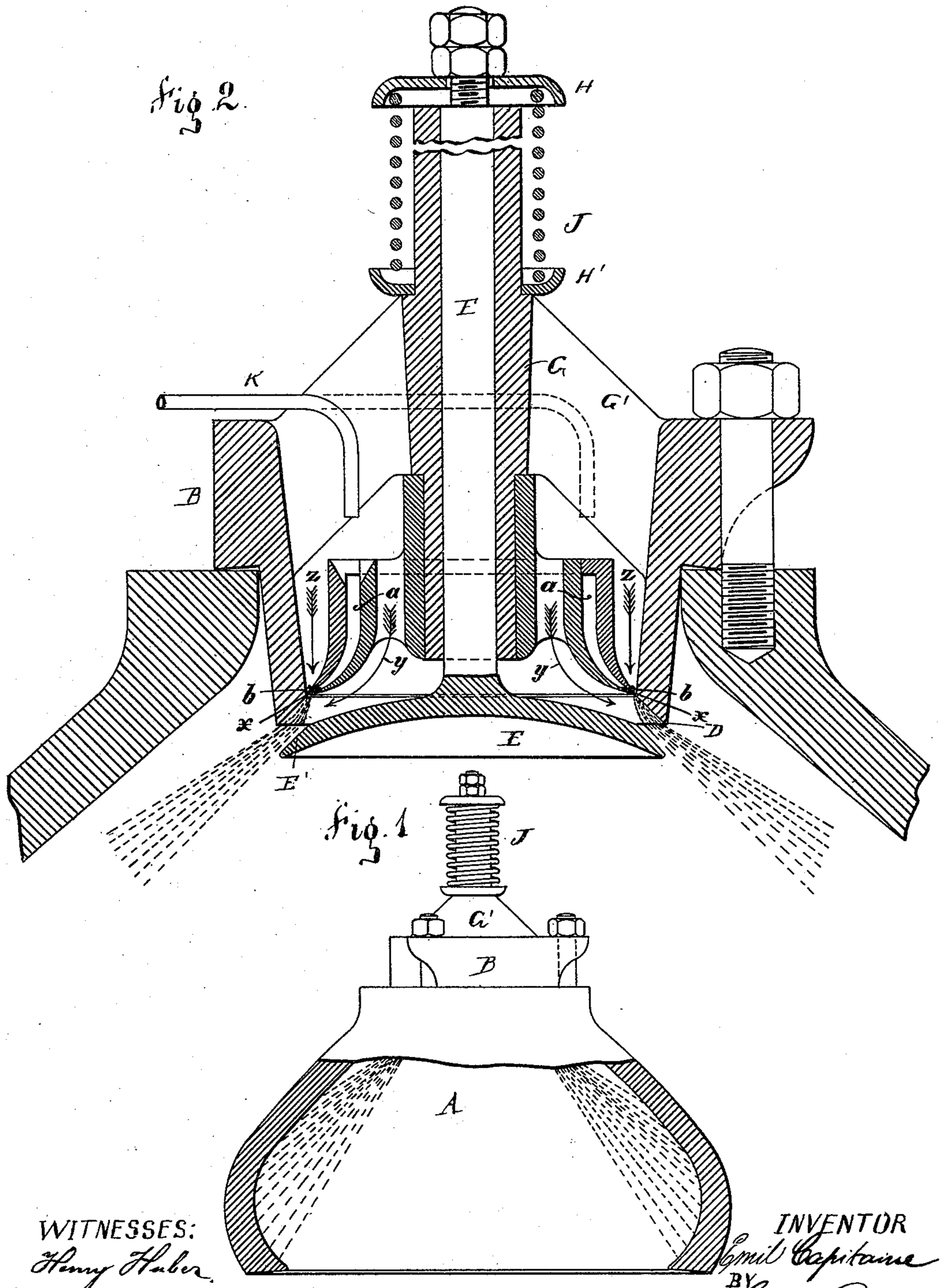

Fig. 1

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EMIL CAPITAINE, OF BERLIN, GERMANY.

ATOMIZER FOR PETROLEUM-GAS ENGINES.

SPECIFICATION forming part of Letters Patent No. 408,460, dated August 6, 1889.

Application filed November 14, 1888. Serial No. 290,791. (No model.)

To all whom it may concern:

Be it known that I, EMIL CAPITAINE, of Berlin, Germany, have invented a new and Improved Atomizer for Petroleum-Gas Engines, of which the following is a specification.

This invention relates to an improved atomizer for petroleum-motors, and especially for that class of petroleum-motors in which the oil is vaporized and converted into gas, the mixture of gas and air is compressed and then ignited, the piston making four strokes for each rotation; and the object of my invention is to provide an atomizer of such construction that the atomized oil is converted into a vapor or gas in the comparatively-small explosion-chamber during the short time that the piston moves from said atomizer and produces suction, thus preventing particles of oil not converted into vapor from coming in contact with the cold walls of the cylinder.

The invention consists in the construction and combination of parts and details, as will be fully described and set forth hereinafter, and finally be pointed out in the claims.

In the accompanying drawings, Figure 1 is a partial elevation and transverse vertical section of the explosion-chamber of a petroleum-motor provided with my improvement. Fig. 2 is an enlarged transverse vertical sectional view of the atomizer.

Similar letters of reference indicate corresponding parts.

The explosion-chamber A is made flaring from the top downward, and is slightly contracted at the lower end that is to be connected with the top of the cylinder. In the top opening of said explosion-chamber the slightly-tapered annular bushing B is held and projects into the upper end of the explosion-chamber, the lower end of said bushing B being beveled to form an annular seat D for the beveled edge E′ of the valve E, secured or made integral with a stem F passing through the longitudinal bore of a tubular guide-piece G, supported by arms G′ of the bushing B. A disk H is held by suitable nuts on the upper end of the valve-stem F, and against said disk the upper end of the spiral spring J bears, which surrounds the fixed guide-tube G, the lower end of said spring resting on a disk H′, in turn resting on a shoulder of said guide-tube G. The spring J, pressing upward, has a tendency to keep the valve E on its seat. An annular nozzle *a* is fixed on the lower part of the guide-tube G and is flared outward at the bottom, so that the bottom edge *b* of said nozzle is a short distance from the bottom edge of the inner surface of the bushing B. The channel or compartment of the nozzle *a* is tapered toward the bottom, the bottom edge or opening of said nozzle having a very fine slot *x*. A pipe K serves to conduct the petroleum or other oil to the nozzle *a*. The air that enters into the explosion-chamber at the top passes the inner and outer annular surfaces of the nozzle *a*, and the air that passes down between the outer surface of the nozzle *a* and the inner surface of the bushing B atomizes the oil passing out of the bottom annular slot *x* of said nozzle, and has a tendency to throw the atoms of oil in the direction of the arrows *z* against the face of the valve E; but this is prevented by the air passing through the space bordered by the inner surface of the annular nozzle *a* in the direction of the arrows *y*, which deflects the current of atoms and throws it outward, as shown in the drawings.

The atomized oil in passing through the spaces between the valve and its seat is surrounded by a layer of air—that is to say, there is a minute layer of air between the valve-seat D and the atomized oil, and likewise there is a layer of air between the atomized oil and the beveled edge E′ of the valve E, thus preventing wetting of the valve or its seat by the atomized oil.

The atomized oil, which is sprayed in the form of a hollow cone, strikes the hot walls of the explosion-chamber, as shown by broken lines in the drawings, and is at once converted into a gas, which, mixed with the air that has served to atomize the oil, produces an explosive mixture.

No particles of oil can come in contact with the cold walls of the cylinder, as all the particles of oil have been converted into vapor, in the manner described, in the explosion-chamber.

The angle at which the spray of oil passes into the explosion-chamber depends upon the bevel of the valve and its seat. The angle

of this bevel and also the exact shape of the explosion-chamber depend upon the length of stroke and the diameter of the cylinder. In a machine having a comparatively long stroke and a cylinder of small diameter the explosion-chamber would have to be lengthened, whereas in a machine of a comparatively short stroke and a greater diameter the explosion-chamber would be shortened. The bevel of the valve E and its seat is adjusted according to the shape of the explosion-chamber.

The above-described atomizer prevents wetting of the valve and seat, and thus also prevents a formation of soot on said valve and seat.

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

1. In a petroleum-engine, the combination, with an explosion-chamber flared from one end to the other and slightly contracted at the larger end, of an atomizer for atomizing oil located at the smaller end of said chamber, substantially as set forth.

2. In a petroleum-engine, the combination, with an explosion-chamber, of a bushing in an opening of said chamber, a valve fitting against a seat formed at the inner end of said bushing, and a nozzle located within said casing, so as to form air-passages on the inner and outer surfaces of said nozzle, substantially as set forth.

3. The combination, with an explosion-chamber flared from one end to the other, of a bushing located in an opening in the smaller end of the explosion-chamber, a valve seating against the bottom edge of said casing, an annular nozzle within said bushing having its bottom flared outward to be in close proximity to the bottom edge of the inner surface of said bushing, said nozzle being so located as to form air-passages on its inner and outer surfaces, substantially as set forth.

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

EMIL CAPITAINE.

Witnesses:

BERNH. POERSCHMANN,

CARL BORNGRAEBER.