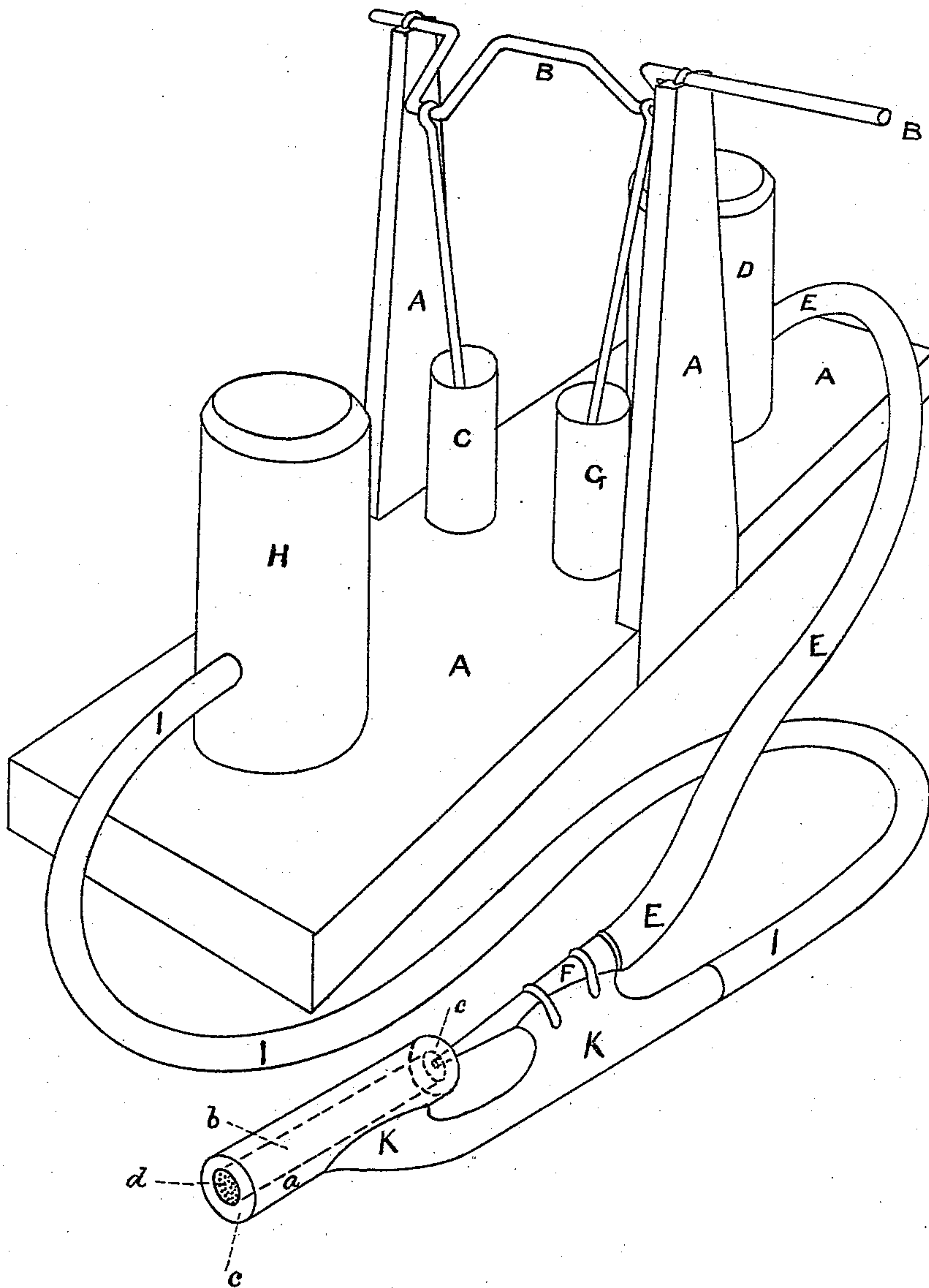


C. & W. C. CLEVELAND.

Fire-Engine.

No. 125,883.

Patented April 23, 1872.



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# UNITED STATES PATENT OFFICE.

CLEMENT CLEVELAND, OF NEW YORK, AND WILLIAM C. CLEVELAND, OF ITHACA, NEW YORK.

## IMPROVEMENT IN FIRE-ENGINES.

Specification forming part of Letters Patent No. 125,883, dated April 23, 1872.

### SPECIFICATION.

*To all whom it may concern:*

Be it known that I, CLEMENT CLEVELAND, of the city of New York, and I, WILLIAM C. CLEVELAND, of Ithaca, in Tompkins county, and State of New York, have invented a new and useful Fire-Engine; and we do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

Figure 1 is a perspective view of the engine with its hose and atomizing apparatus.

The object of our invention is the more ready and immediate extinction of fire. The method now in general use is that in which the water is discharged in a continuous stream from an open pipe attached directly to the hose. By this method the stream remains compact until it strikes the object upon which it is directed, thus presenting the least possible amount of surface to the fire. The physical effect of water upon fire is the reduction of the temperature of the combustibles—gases or whatever they may be—to below the point of combustion, when the fire ceases. As water requires so large a quantity of heat for its vaporization it is one of the best, as well as being the most readily attainable mediums for this purpose. The greater the amount of surface exposed by a given body of water to the source of heat the greater will be the amount of vaporization, and, consequently, the greater will be the reduction of temperature at the source of heat. Steam has little effect in quenching fire, as it has already received its heat of vaporization; but, if water, still in the liquid state, can be presented to the fire in a very finely-divided condition, as in a dense cloud of mist or spray, the amount of surface displayed will be the greatest possible, the amount of heat received the greatest possible, and thus will be produced the greatest possible reduction of temperature, quickly extinguishing the fire. Our method is to present the water to the fire in this finely-divided or atomized condition.

To accomplish this purpose we connect our

source of power with a pump forcing water into a receiver, technically called an "air-chamber," in which the air acts as an elastic cushion, causing a uniform flow of water, as in all ordinary fire-engines. In addition and combination with this we employ another pump for forcing air into a receiver, there condensing it and developing an elastic force. From the water-receiver the water is conducted by hose, as in ordinary fire-engines. The condensed air is conducted in its own proper hose. These lines of hose are united to an atomizing apparatus, and by the combined effect of the air and water a cloud of atomized water is discharged from the outlet.

To enable others to practice our invention we will now describe it in detail, the letters of reference being those used in the drawing.

A is the frame supporting the working parts and connections. B is the medium of connecting and communicating power. C is the air-pump, connecting with the air-receiver D, by the proper pipes and valves. E is the line of hose for conducting the air to F, the blast-pipe of the atomizing apparatus. G is the water-pump, connecting by pipes and valves with H, the water-receiver. I is the line of hose conducting water to K, the water-outlet, which is composed of *a*, an outer cylinder, *b*, an inner cylinder, open at both ends; and *cc*, end plates inclosing a water-space between the two cylinders; this water-space communicating directly with the hose I, and with the hollow of the inner cylinder by means of numerous perforations *d d*, through which the water is forced in fine streams, there meeting the blast of air from the blast-pipe F, which is directed so that the blast shall pass directly through the inner open cylinder *b*, thus atomizing and giving direction to the flow.

Having now described our invention in such a manner that those skilled in the arts may practice it, what we claim as our invention, and desire to secure by Letters Patent, is—

1. A fire-engine, consisting of air and water forcing pumps C and G connecting, by means of tubes, with an atomizing apparatus,



consisting of a hollow trunk, K, opening into a water-jacket, *a*, surrounding a perforated tube, *b*, and the air blast-pipe F directed through the open tube *b*, all as described above.

2. The atomizing apparatus above described, consisting of an air blast-pipe, F, directed through the opening of a hollow tube, *b*, (open at both ends and perforated by openings *d d*,) surrounded by a water-jacket, *a*, communicating with the hollow trunk K.

The above specification of our said invention, signed and witnessed at Ithaca, and New

York, this 7th day of December and this 16th day of December, A. D. 1871.

CLEMENT CLEVELAND, M. D.  
WILLIAM C. CLEVELAND.

Witnesses to the signature of C. CLEVELAND:

SAML. HUGHES,  
HARRY HUGHES,

Witnesses to the signature of W.C. CLEVELAND:

A. T. CLEVELAND,  
MYRON G. STOLP.