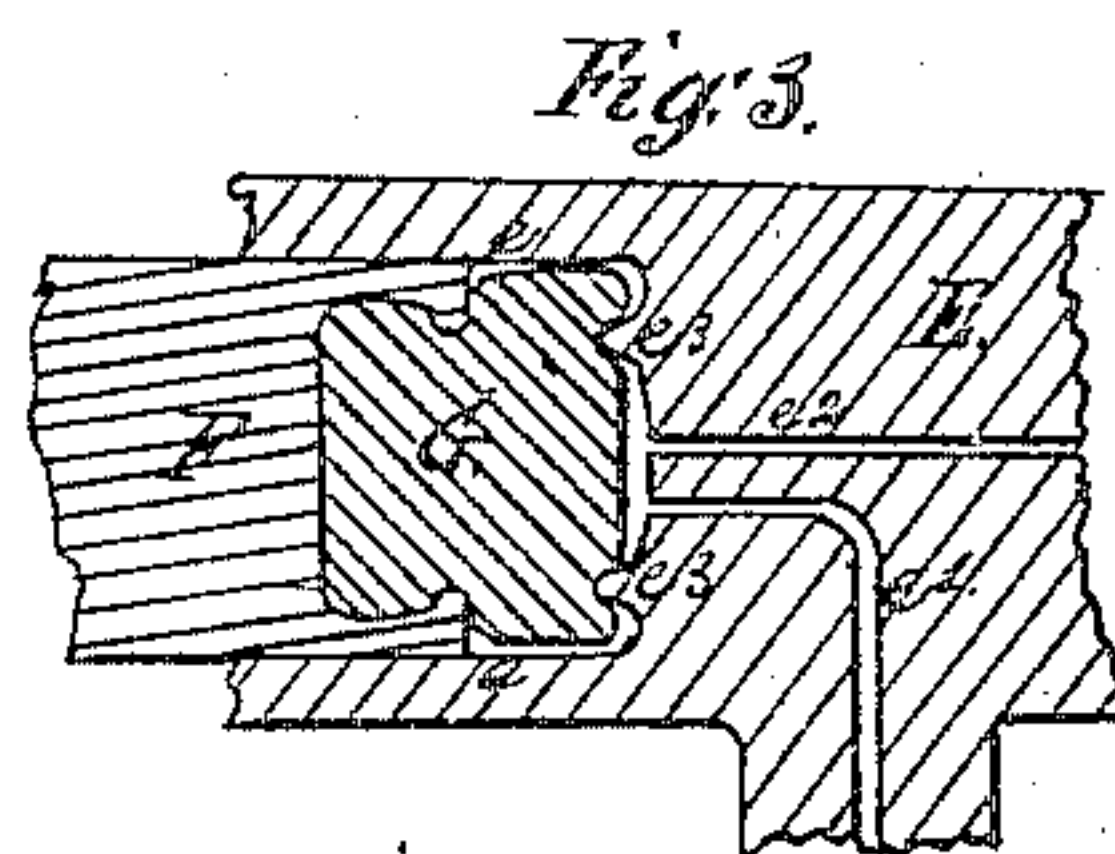
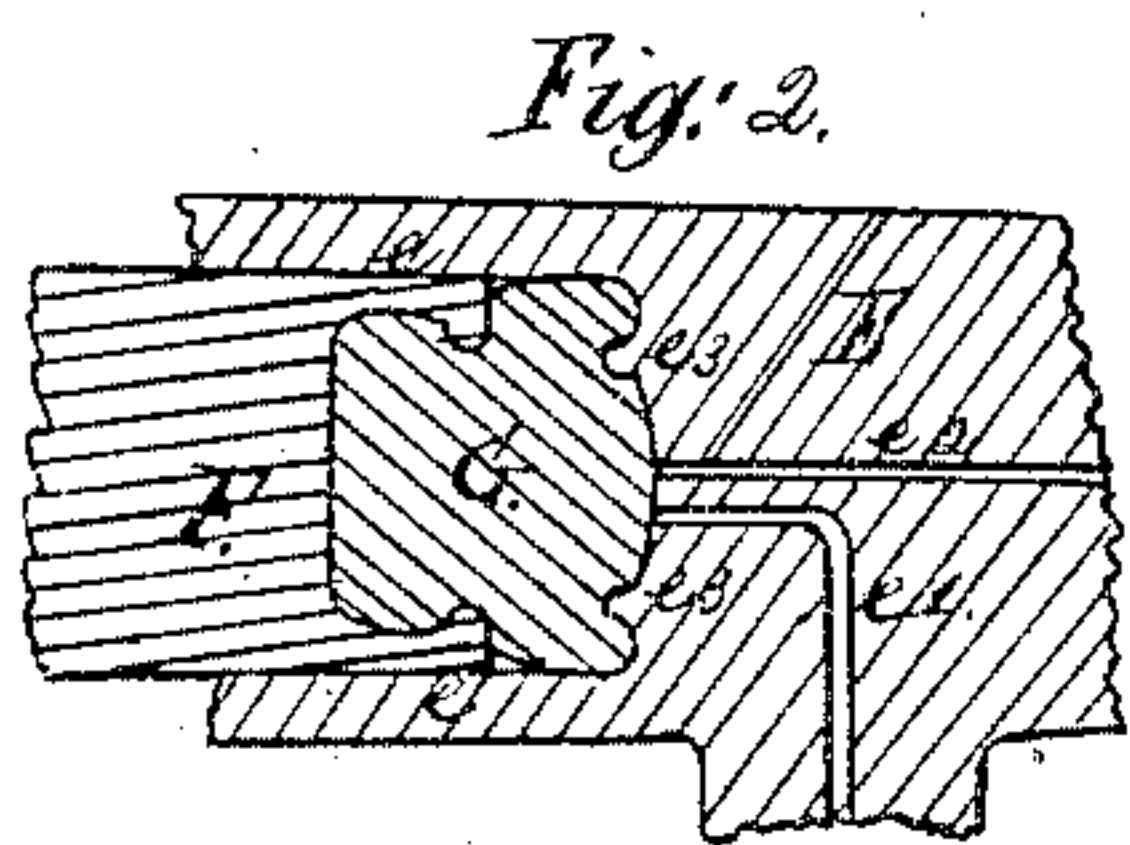
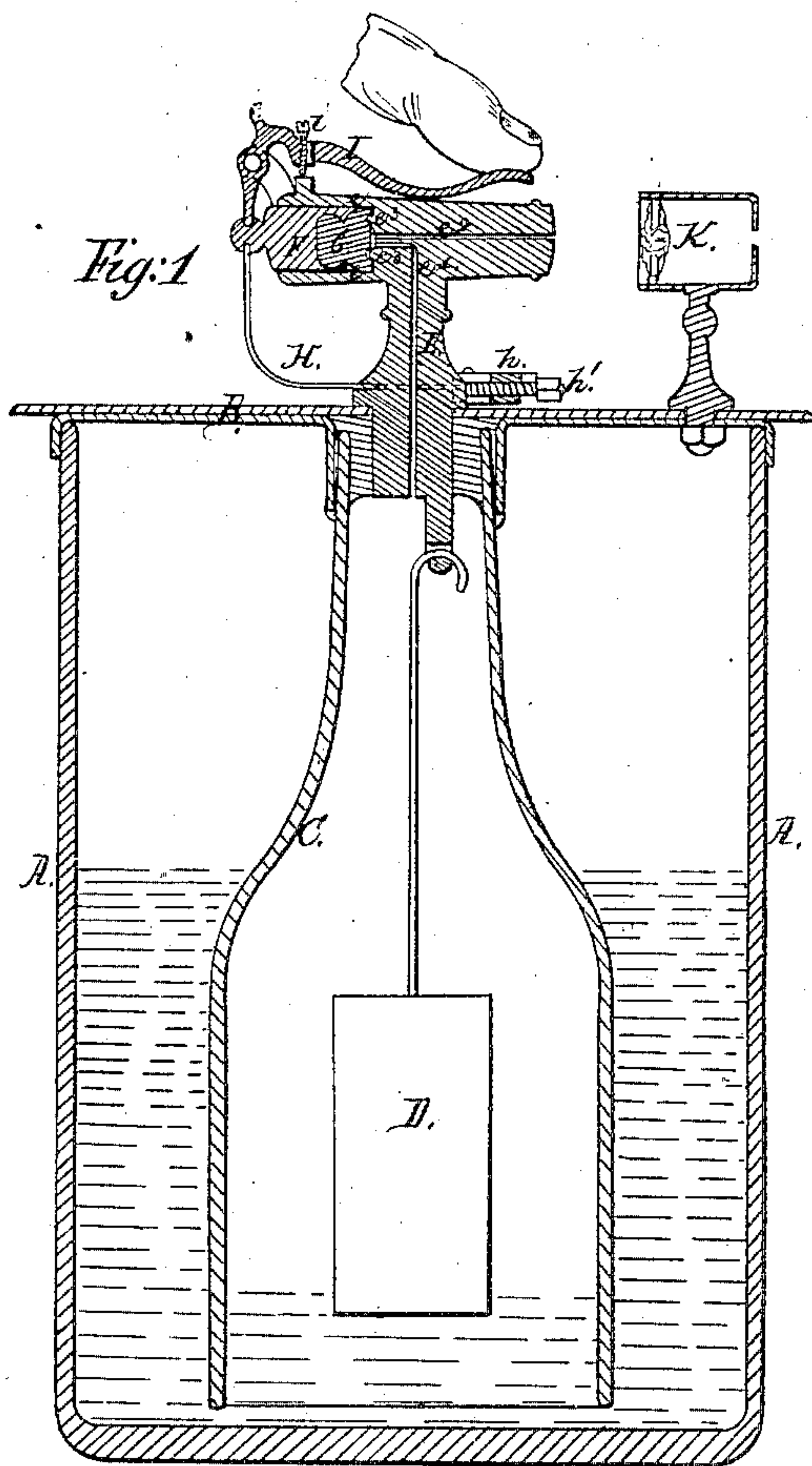


No. 36,971.

PATENTED NOV. 18, 1862.

J. TAYLOR & R. W. BROWN.  
DOBEREINER HYDROGEN LIGHTER.



Witnesses.

Geo. S. Boy  
William P. Boy.

Inventor.

John Taylor  
Russell W. Brown.



# UNITED STATES PATENT OFFICE.

JOHN TAYLOR AND R. W. BROWN, OF WESTERLY, RHODE ISLAND.

## IMPROVEMENT IN THE DOBERSINER HYDROGEN LIGHTER.

Specification forming part of Letters Patent No. 36,971, dated November 18, 1892

*To all whom it may concern:*

Be it known that we, JOHN TAYLOR and RUSSELL W. BROWN, of Westerly, in the county of Washington and State of Rhode Island, have invented certain new and useful Improvements in Hydrogen Lighters for Domestic and other Purposes; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of our invention; and Figs. 2 and 3 are magnified sections of the valve, Fig. 2 showing the valve closed, and Fig. 3 the same open.

Our invention relates to the construction of the valve, whereby a very simple, efficient, and cheap valve is secured, which is not liable to become leaky by use.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation by the aid of the drawings and letters of reference thereon, the same letters referring to like parts in all the figures.

A is a jar of glass or earthenware having a lid, B, secured thereto. From the under side of this lid is suspended a bell-shaped glass, C, extending nearly to the bottom of A, as represented, and within the bell C is suspended a piece of zinc, D. A mixture of sulphuric acid and water is poured into the jar A, and rising in the bell attacks the zinc, thus generating hydrogen gas, which collects in the bell and drives out the diluted acid until the zinc is no longer exposed to its action, when the formation of gas ceases. These parts and their action are similar to those heretofore known.

In the lid B, and extending into the bell C, is a nozzle, E, of the form represented. A chamber, *e*, is bored in the rear end, as represented, and a passage, *e'*, leads therefrom to the interior of the bell. Another passage, *e''*, leads from this chamber to the front of the nozzle, as represented, and the openings to these two passages are near the center of the chamber *e*. In the base of this chamber and surrounding the opening of the two passages *e'* and *e''* is an annular lip or flange, *e<sup>3</sup>*. A plunger, F, is fitted to play in the chamber *e* and to receive on its end a piece of india-rubber, G. A spring, H, forces the plunger toward the base of the chamber and causes the rubber G to tightly embrace the lip or flange *e<sup>3</sup>*, and to enter the cav-

ity within it, thus closing the openings of both the holes or passages *e'* and *e''*, and preventing the escape of gas through the same. A lever, I, is provided for lifting the plunger F and opening the holes *e'* and *e''* to permit the flow of gas from the bell. A stop-screw, *i*, is provided to so gage the action of the lever I that while the pressure of the spring H is so far relieved as to allow the holes *e'* and *e''* to be opened and gas to pass around from one to the other, the rubber G cannot be sufficiently lifted to relieve its pressure upon the lip *e<sup>3</sup>*, so as to permit the escape of gas into the chamber *e*. The spring H is provided with a yoke, *h*, and screw *h'*, whereby it may be tightened to produce the required pressure to cause the rubber to tightly close both holes *e'* and *e''*. The gas escaping from *e''* impinges upon a piece of platina sponge, K, in the ordinary manner, and is thereby ignited, and may be used to ignite a splinter of wood or other object placed therein.

In preparing the valve G we coat it with metallic bronze-powder, to prevent it from sticking to the surface of the valve-seat, in the following manner: We first burn the surface of the rubber so as to cause it to firmly adhere to the socket in F, and then place it therein. The portion which remains exposed is covered with bronze-powder, which adheres to the surface and forms a metallic coating, which, while it effectually prevents any adhering of the rubber to the valve-seat, in no way interferes with the elasticity of the rubber. This coating is represented in the drawings by a thin yellow line.

As hydrogen-igniting apparatus has been heretofore constructed, the cock by which the gas was allowed to flow to the platina sponge was very liable to wear and become leaky, when the gas was constantly escaping and the use of the apparatus thereby rendered expensive and annoying.

By our improved construction the following advantages are secured: The valve may always be kept tight with no perceptible wear. The rubber fitting always on the lip *e<sup>3</sup>* prevents any escape of gas, except through the passage *e''*, and the strength of the spring H is easily adjusted by means of the screw *h'* to cause the rubber G to tightly close one or both the hole *e'* or *e''*. It will be seen that by this arrangement of the holes and valves a double security



against leakage is obtained, for if either of these holes be stopped the passage is effectually closed, even if the other be left open. The valve G is very certain to close one, even if the pressure of the spring be not quite sufficient to close both.

Our valve is self-closing and cannot be left open for the escape of gas like the ordinary cock. This is an essential advantage in domestic use, where inexperienced persons are liable to use the apparatus.

By the coating of the rubber valve G with bronze-powder all liability to derangement from adhesion of the valve to its seat is avoided.

The nozzle E and the other exterior parts may be made in various forms or designs to please the taste of the maker or customer without interfering with the proper action of our invention, and the whole may be inclosed in a case to avoid the danger of breakage, if desired.

Having now fully described our invention, what we claim as new, and desire to secure by Letters Patent, is--

1. The arrangement of the two openings  $e'$  and  $e''$  and the surrounding lip  $e^3$ , or its equivalent, with the elastic valve G, as and for the purpose herein set forth.

2. The employment of the adjustable spring H, in combination with the above, for the purpose described.

3. The valve herein described, composed of india-rubber and coated with fine bronze-powder or its equivalent, for the purpose set forth.

In witness whereof we have hereunto set our hands.

JOHN TAYLOR  
RUSSELL W. BROWN.

Witnesses:

GEO. S. COY,  
WILLIAM P. COY.