

(No Model.)

M. J. HINDEN.
HYDROGEN LIGHTER.

No. 301,057.

Patented June 24, 1884.

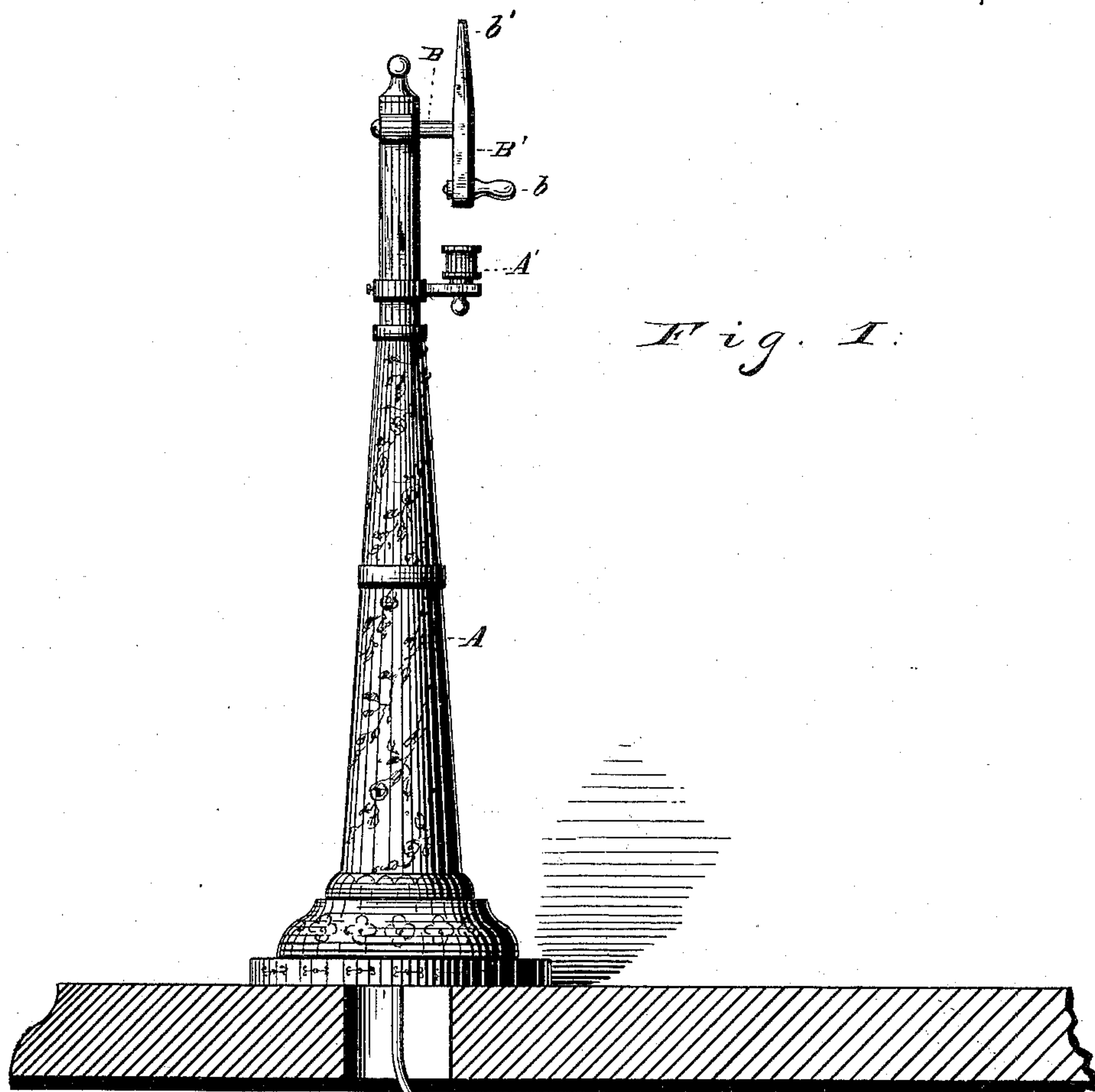


Fig. 1.

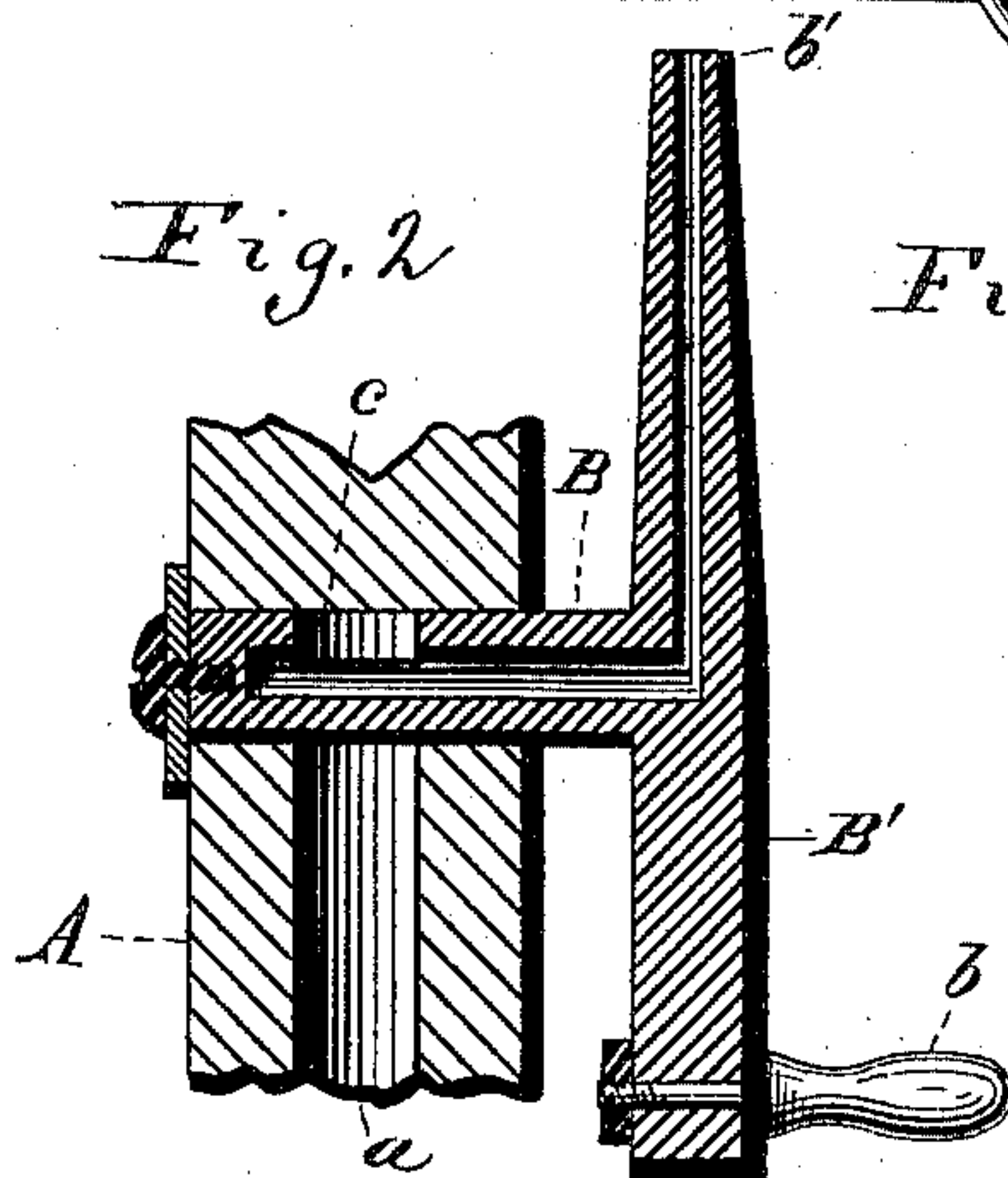


Fig. 2.

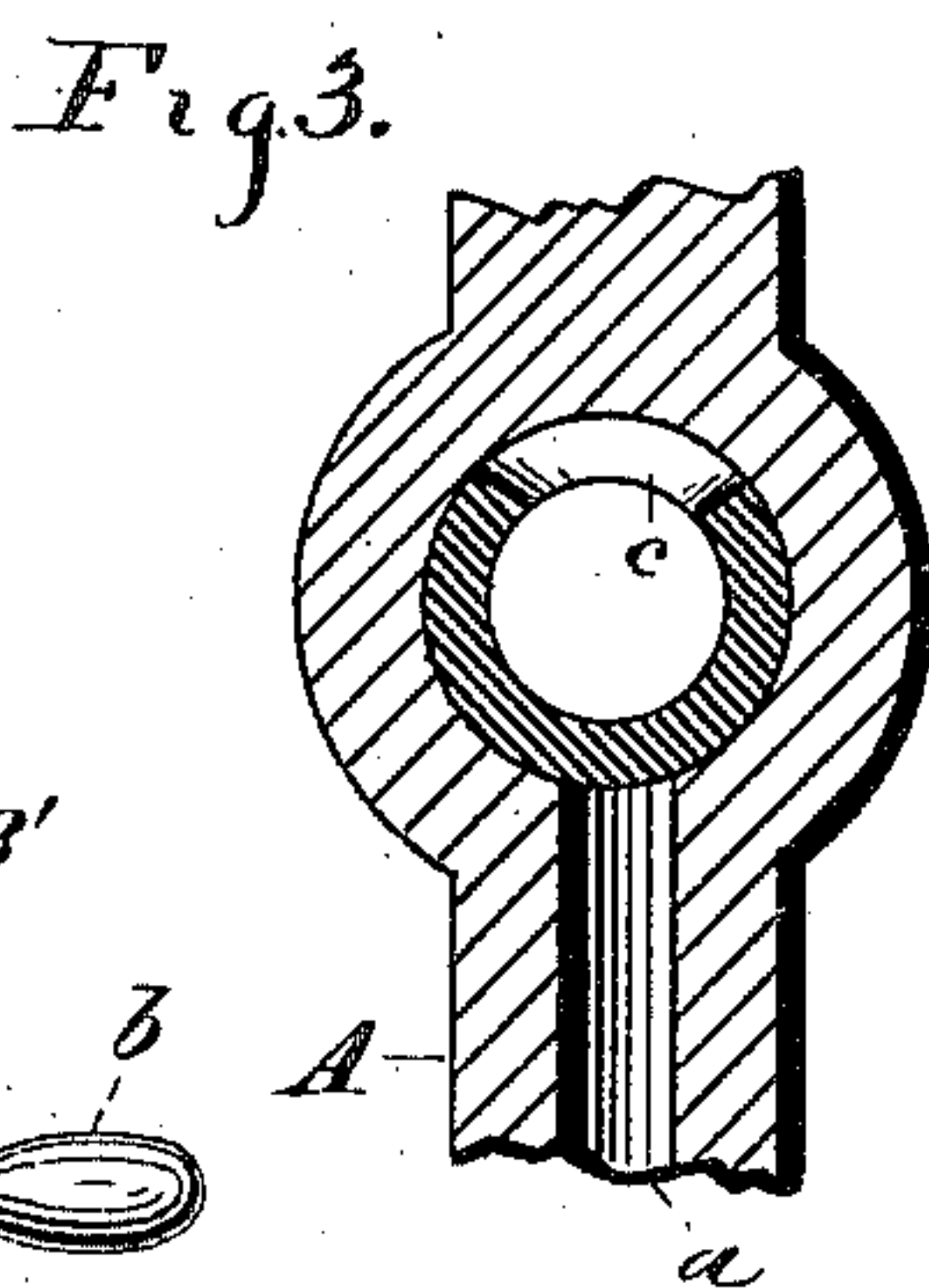
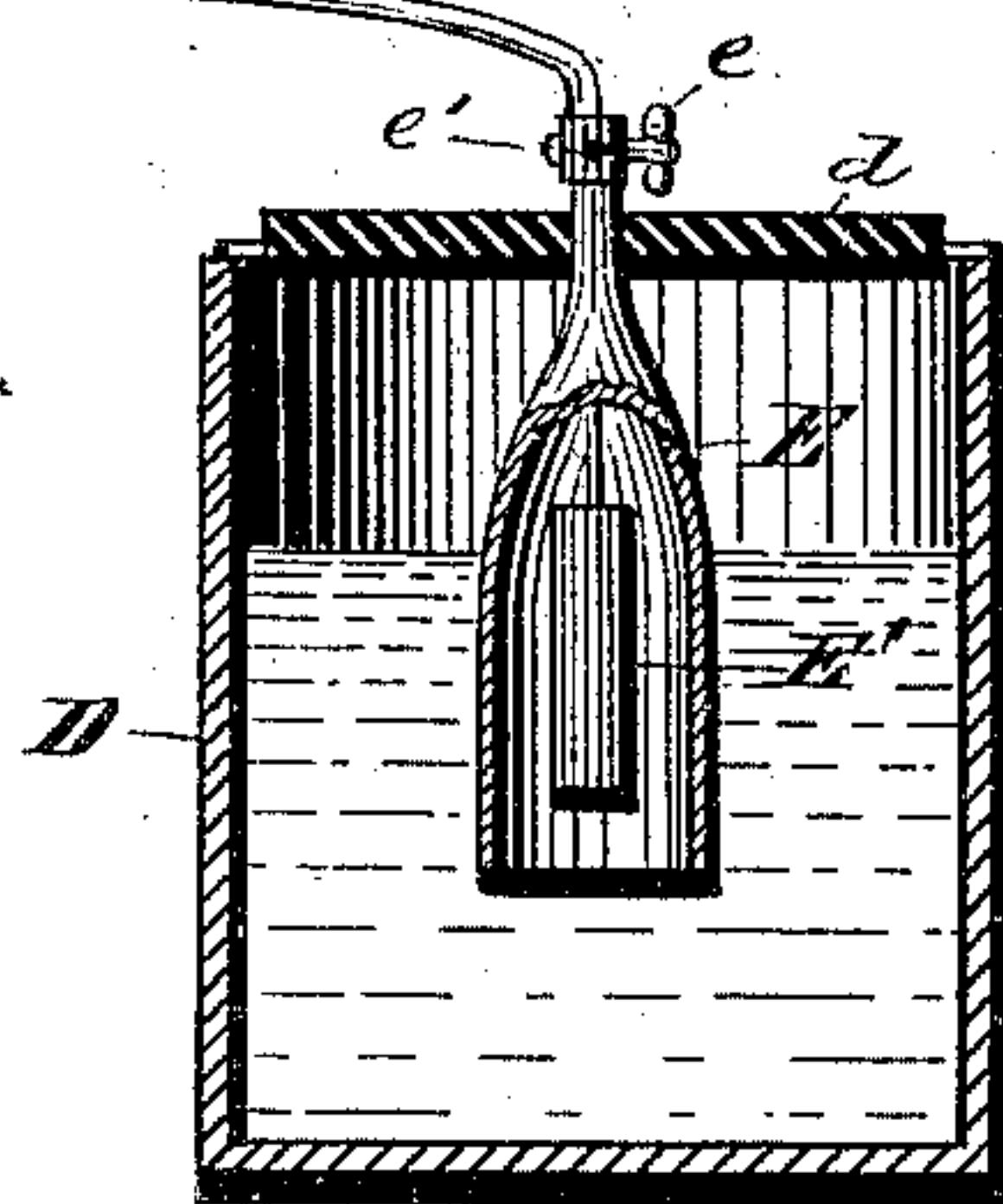


Fig. 3.



WITNESSES

W. Engel
Geo. W. King

INVENTOR

Mathias J. Hinden
By Seggett & Seggett
ATTORNEYS

UNITED STATES PATENT OFFICE.

MATHIAS J. HINDEN, OF CLEVELAND, OHIO, ASSIGNOR TO THE HYDROGEN LIGHTER COMPANY, OF SAME PLACE.

HYDROGEN-LIGHTER.

SPECIFICATION forming part of Letters Patent No. 301,057, dated June 24, 1884.

Application filed November 7, 1883. (No model.)

To all whom it may concern:

Be it known that I, MATHIAS J. HINDEN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and
5 useful Improvements in Hydrogen-Lighters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the
10 same.

My invention relates to improvements in hydrogen-lighters; and it consists in certain features of construction and in combination of parts, hereinafter described, and pointed
15 out in the claims.

The object of my invention is to improve a device on which I have already obtained Letters Patent of the United States No. 275,045, granted April 3, 1883.

20 In the drawings, Figure 1 is an elevation of my improved lighter, with a portion of a table and the apparatus for producing hydrogen-gas. Fig. 2 is a vertical section of the upper end of the lighter, showing the construction
25 of the cock. Fig. 3 is a vertical section taken at right angles to section shown in Fig. 2.

A represents a hollow standard, in which is seated the cock B, that is integral with the lever B', and is provided with the handle b.
30 The central bore of the cock connects with a bore that extends through one end of the handle and terminates at b', as shown in Fig. 2. A slot, c, in the cock leads into the central bore and extends about one-quarter around the cock, as shown in Fig. 3. The relative
35 positions of the slot and lever are such that when the point b' is turned down so as to point into the cup A' the slot c will be in open relation with the orifice a in the standard, and by
40 means of the long slot c this open relation will continue when the lever is turned so that the point b' extends in front toward the operator. When the handle is in the position shown, the cock is closed, and the end to which the handle is attached being heavier than the hollow
45 end, the cock will remain closed when not in use. The cup A' is supported by a short arm provided with a band that embraces the upper portion of the standard, and is held in
50 position by a set-screw. This portion of the

standard is cylindrical, so that the cup may be raised or lowered for adjustment. Inside of the cup is a small crucible which contains platinum-sponge. At the lower end of the
standard is attached the flexible tube C in
55 open relation with the orifice a. This tube is connected with the cock e, that is attached to the neck of the bottle-shaped glass E, that has no bottom, and that incloses a generating-chamber in which is suspended the block of zinc
60 E'. The part E is secured to the cover d, that fits loosely on the container D, that is filled nearly to the top with a solution of water, ten parts, and sulphuric acid, one part. The cock
65 e is preferably a common three-way cock, one opening leading outside, as shown at e', while the other opening leads into the tube C. When the cover d is placed in the position shown on the container D, the part E extends into the
70 solution aforesaid; but the solution is excluded from the chamber inside by reason of the air in the chamber. The cock e is turned so as to allow the air to escape through the orifice e', when the solution will rise in the said chamber and surround the zinc. The cock e
75 is then turned so as to leave an open passage-way from the said chamber to the tube C. The action of the acid on the zinc forms hydrogen-gas, that soon fills the orifice a, the tube C, and eventually the chamber E, whereby
80 the solution is expelled from the chamber and from contact with the zinc, and the formation of gas ceases. Whenever by means of the consumption of gas at the lighter the solution again comes in contact with the zinc, the ac-
85 tion just described will be repeated.

In place of the three-way cock e, any single-way cock might be used; but the tube C would have to be disconnected to allow the air to es-
90 cape.

In operating the device the point b' of the handle B' is turned down, so that a jet of gas is discharged upon the platinum-sponge within the cup A', and the sponge becoming incandescent by the actions of the gas, the latter is
95 ignited. The part b' may now be turned toward the operator, and a jet of burning gas will issue therefrom until, by turning the handle to the position shown, the cock is closed.

What I claim is—

1. The combination, with a gas-generator and a standard, of a combined handle and cock journaled to the standard, and a cup for holding platinum secured to the standard below the cock, the handle end of the said cock being heavier than the opposite end thereof, for the purpose of automatically cutting off the flow of gas, substantially as set forth.

2. In a hydrogen-lighter, the combination of the combined cock and handle, a standard supporting the same and made cylindrical at its upper end, and a cup supported from this part of the standard and adjustable vertically to bring it in proper relation to the gas when discharged downwardly from the cock, substantially as set forth.

3. In a hydrogen-lighter, the combination of the combined cock and handle, a standard supporting the same and made cylindrical at

its upper end, and a cup supported from the part of the standard and adjustable vertically to bring it in proper relation to the gas when discharged downwardly from the cock, the said cock and standard being provided with openings so situated that when the open end of the cock points toward the cup the cock will be open and remain open until it has been turned around one-quarter of a circle and remain closed in all other positions, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 31st day of October, 1883.

MATHIAS J. HINDEN.

Witnesses:

CHAS. H. DORER,
GEO. W. KING.