

G. E. Hayes,
Vulcanizing Lamp.

N^o 40,750.

Patented Dec. 1, 1863.

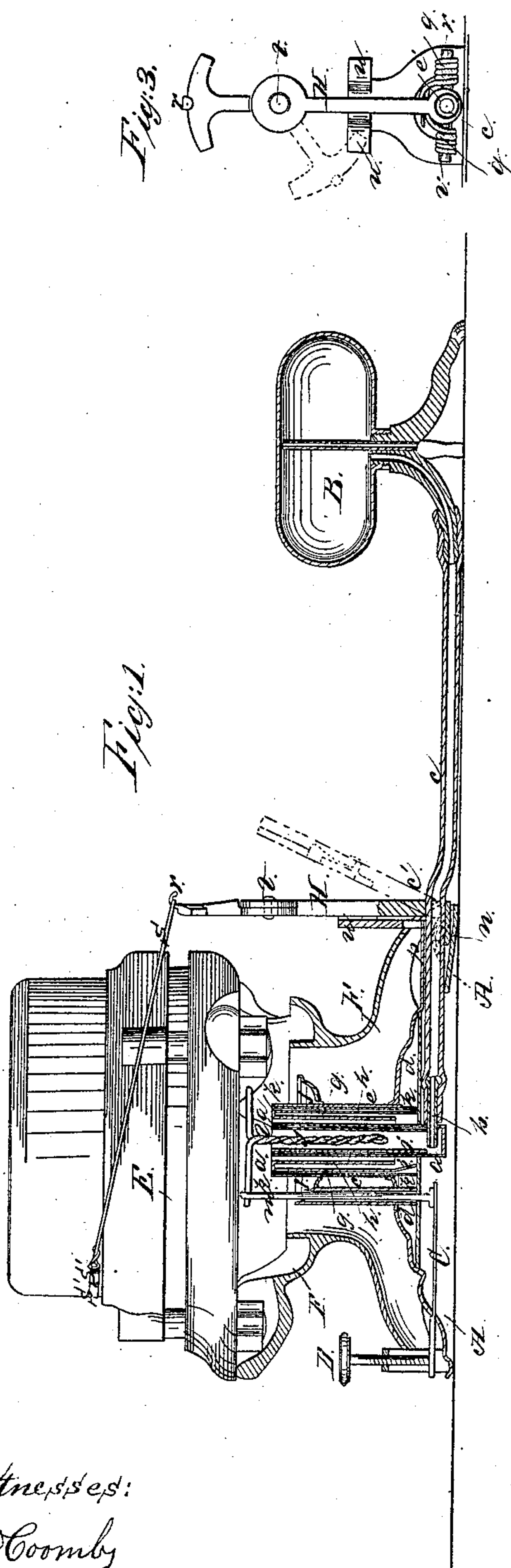


Fig. 1.

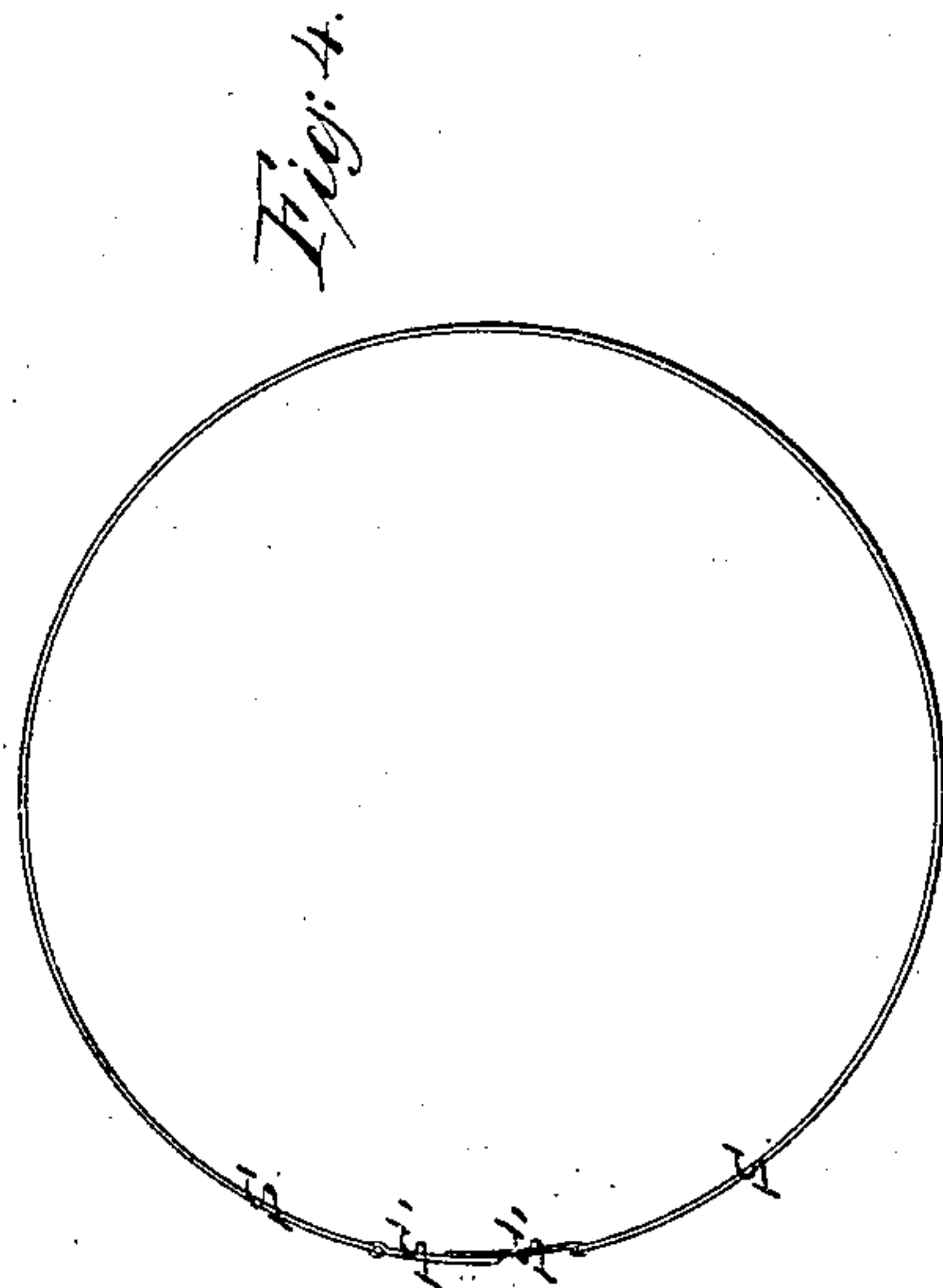


Fig. 4.

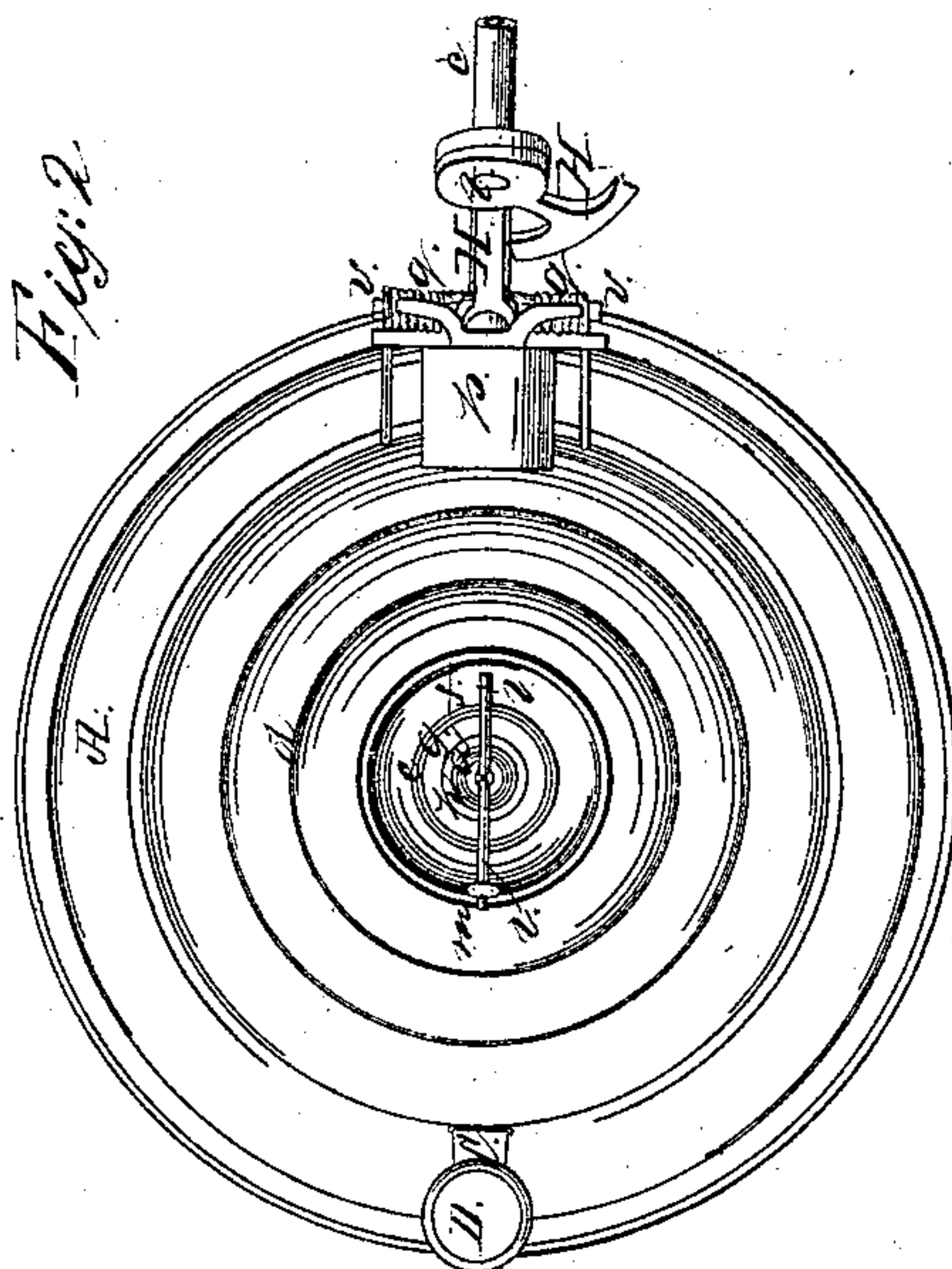


Fig. 2.

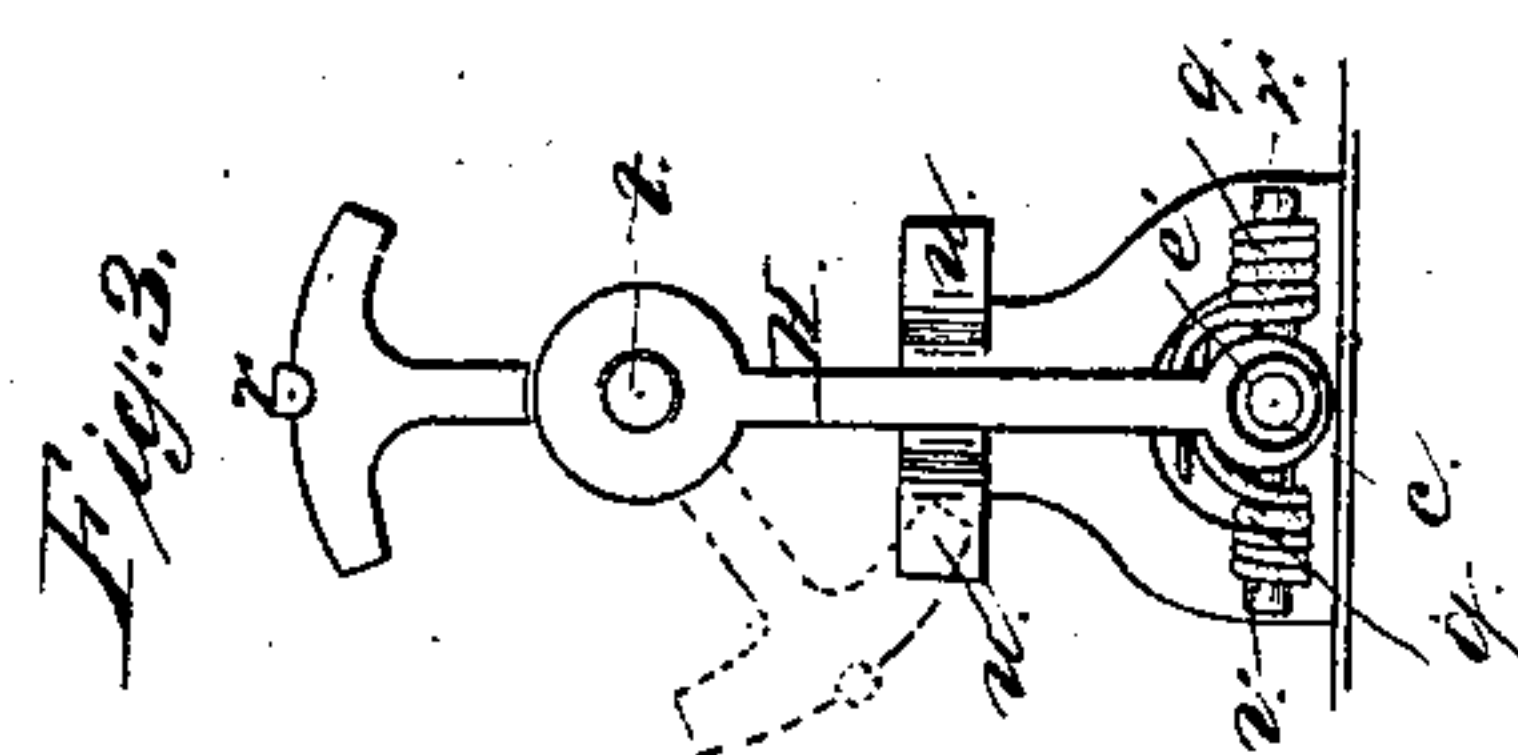


Fig. 3.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN DENTISTS' LAMPS FOR VULCANIZING.

Specification forming part of Letters Patent No. 40,750, dated December 1, 1863.

To all whom it may concern:

Be it known that I, GEORGE E. HAYES, of Buffalo, in the county of Erie and State of New York, have invented a new and Improved Spirit-Lamp for Dentists' Vulcanizing Apparatus and other Purposes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of a dentists' vulcanizing apparatus, having my improved lamp applied. Fig. 2 is a plan view of the burner. Fig. 3 is a front view of the principal portion of the extinguishing apparatus. Fig. 4 is a top view of a portion of the same.

Similar letters of reference indicate corresponding parts in the several figures.

The principal object of my invention is to provide for the heating of dentists' vulcanizing apparatus and the regulation of the heat thereof in such a manner as to effect perfect vulcanization in the shortest time practicable, without the constant attention of the dentist, which, with the means of heating heretofore in use, has been necessary to insure perfect work.

In performing the vulcanizing process, the work may be heated rapidly to a temperature of about 280° Fahrenheit; but beyond this point the increase of temperature to the vulcanizing point must be regular, and not exceed 1° Fahrenheit a minute. It is also desirable to have the temperature remain near that point for some minutes, but detrimental to have it greatly exceed that point.

My invention consists in a novel construction of and system of burners, and in an extinguishing apparatus connected therewith, whereby the work is enabled to be heated rapidly to as high a point as it is safe to do so, and then to heat more slowly to the vulcanizing-point, and whereby the flame is extinguished when vulcanization has been completed.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the base of the lamp, having secured in its center an upright metal tube, *a*, which is open at the top but close at the bottom, and

which is furnished at or near its bottom with a nozzle, *b*, for the connection of a flexible tube, *c*, of india-rubber or other suitable material, which supplies the spirit to the lamp from the spirit-holder B, which may be arranged upon the same table or base with the lamp.

Within the base A there is formed a small spirit-chamber, *d*, having no communication with the tube *a*, but having attached to and communicating with it the bottom of a much larger tube, *e*, concentric with and standing up to the same height as *a*. This tube *e* has provided around its exterior, near the top, an annular cup or channel, *f*, for the collection of any overflow from the said tube.

The chamber *d* and its tube *e* are filled with spirit by temporarily raising up the spirit-holder tube *a*, and the tube *e* constitutes a burner which produces a large flame which burns for a sufficient time to aid the smaller flame from the tube *a* in rapidly heating up the vulcanizing-box to about 280° Fahrenheit, and when the supply of spirit in the chamber *d* has been all consumed, the flame from the smaller central burner continues to slowly raise the temperature within the said box to the vulcanizing-point and keep it heated to that point for a sufficient length of time to complete the vulcanizing process. The height of the spirit-holder B should be such that the pipe *a* will not overflow unless the reservoir is lifted up.

Within the annular space, between the fixed tubes *a* and *e*, there is placed a double cylinder composed of two metal tubes, *g* and *h*, arranged one within the other, the inner and smaller tube, *h*, which is the shorter, being connected with the larger one at the top, and the space between them being closed at the top, but open at the bottom. The bottom of the outer tube, *g*, rests on the bottom of the chamber *d*, and the said tube is just high enough to stand even with the top of the tubes *a* and *e*. In the lower part of the tube *g* there are one or more openings, *i*, to provide for the free supply of spirit from the chamber *d* to the tube *e*. The tube *g* is wrapped round externally with cloth, paper, or other poor conductor of heat, to prevent the heat from passing too rapidly to the central tube, *a*, and the said tube *a* is lined with a smaller tube, *j*,

which is wrapped with similar poor conducting material to prevent heat from passing too rapidly to the space within the said tube *j*. By the application of this poor conducting material to the tubes, I find that the combustion is more equalized. The said material is not intended to act as a wick, the wicks, or what are equivalent thereto, being composed of a very thin split tube, *k*, of copper, placed loosely between the tubes *e* and *g*, and a twisted wire, *l*, placed in the center of the tube *a*, these wicks, if they may be so called, becoming heated by the flame and transmitting their heat down to the spirit and producing the vaporization thereof. The wire *l* has a T-shaped head, which stands across the burner to form a heating-surface to transmit the heat down to the spirit with sufficient rapidity, and one end of the said head is connected by a rod, *m*, with a lever, C, working through the base A, that it may be raised or lowered, while the lamp is burning, by a screw, D, applied to the outer end of said lever. By thus raising and lowering the wire or wick *l*, so as to present a greater portion of it above the burners, and so increase the heating-surface, a greater or less amount of evaporation is produced in the tube *a*, and a greater or less quantity of vapor supplied to the central burner, and the heat from the said burner is regulated.

E is the vulcanizing-vessel, of the usual or any suitable construction, supported at a suitable height above the burners upon a stand, F, which rests upon the base A of the lamp and surrounds the burner.

H is a lever, which constitutes the principal part of the extinguishing apparatus, having its fulcrum *v* at the bottom, and having in its lower part a circular opening, *e'*, just large enough to admit the tube *c* without contracting it. This opening intersects the axis of the fulcrum of the lever, and on the under side of it there is an elongated finger, *n*, which, by the movement of the lever on its fulcrum to the position shown in red outline in Fig. 1, may be made to press the tube *c* upward against a portion, *p*, of the base A, under which the said tube passes, and to compress and close the passage of the said tube and thereby shut off the spirit from the lamp. The said lever has applied to it a spring, *q*, which tends to throw it to the above-mentioned position, and it has at its upper end a hook, *r*, to enable its upper end to be connected with the vulcanizing-box E by means of a wire, *s*, Figs. 1 and 4, surrounding the said box, for the purpose of holding it in the position shown in black outline, and thereby keeping the passage of the tube *c* open. The ends of the wire *s* are connected by two thin strips of metal, *s' s'*, which are laid face to face and soldered together with an alloy, which will be fused by the heat of the vulcanizing-box when the latter has reached the highest point desired. The alloy which I

generally use for this purpose in vulcanizing india-rubber is composed as follows: Tin, forty-five parts; lead, twenty-seven parts; bismuth, four parts; but for other purposes these proportions can be varied.

In order to allow the tube *c* to be kept open when necessary, while the wire *s* is not attached, the lever is made with a T-shaped head and with a pivot-joint at *t*, to enable it to be hooked, as shown in red outline in Fig. 4, against an upright standard, *u*, secured to the base of the lamp, by which means the lever can be kept in the position to leave the passage open.

The operation of the lamp for vulcanizing is as follows: The spirit-holder B, which holds a little more than sufficient for the process, is filled, and the holder is then held up to produce an overflow of spirit from the tube *a* to fill the chamber *d* and tube *e*. The holder B is then replaced on the table, the vulcanizing-box containing the work to be vulcanized is then placed on its stand F, the wire *s* slipped over the said box and over the hook *r* of the lever H, to secure the lever in the position shown in black outline in Fig. 1, and keep the passage of the tube *c* open. The lamp is then lighted, and, owing to the great heat generated by the two burners, the box E and its contents are quickly heated up to about 280° Fahrenheit.

The quantity of spirit contained in the chamber *d* and tube *e* is such that it will be all consumed when the temperature has reached this point, and the inner burner, *a*, is so regulated by the wire *l* that it will continue to heat the box E to 330° Fahrenheit at the rate of one degree per minute, when the solder which unites the strips *s' s'* will melt and allow the wire *s* to part, and so allow the spring *q* to throw the lever H to the position shown in red outline in Fig. 1, and cut off the supply of spirit from the holder B. The quantity of spirit then remaining between the cut-off *n* and the tip of the burner *a* will then burn with a gradually-diminishing flame for about ten minutes, when it will be consumed, and the flame will go out, and during this time the temperature of the box E will have diminished to 320° making in all about twenty minutes since that point was first reached, which is insufficient to complete vulcanization.

When it is desired to use the lamp again, the spirit-holder is to be refilled, and the ends of the wire *s* may be reunited by taking the pieces *s' s'* in a pair of pliers and holding them in or over the flame of a spirit-lamp, without the application of fresh solder.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a spirit-lamp for vulcanizing or other purposes, of two burners, one of which is supplied by a chamber, *d*, containing a measured quantity of spirit, and the other connected with a reservoir by means of

an automatic cut-off, substantially as herein specified.

2. The cut-off, consisting of a lever, H, encircling the flexible supply-pipe c, and a wire, s, or its equivalent, having its ends united with fusible solder, applied in combination with the vulcanizing-box E or other appara-

tus, to operate to substantially as herein specified.

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