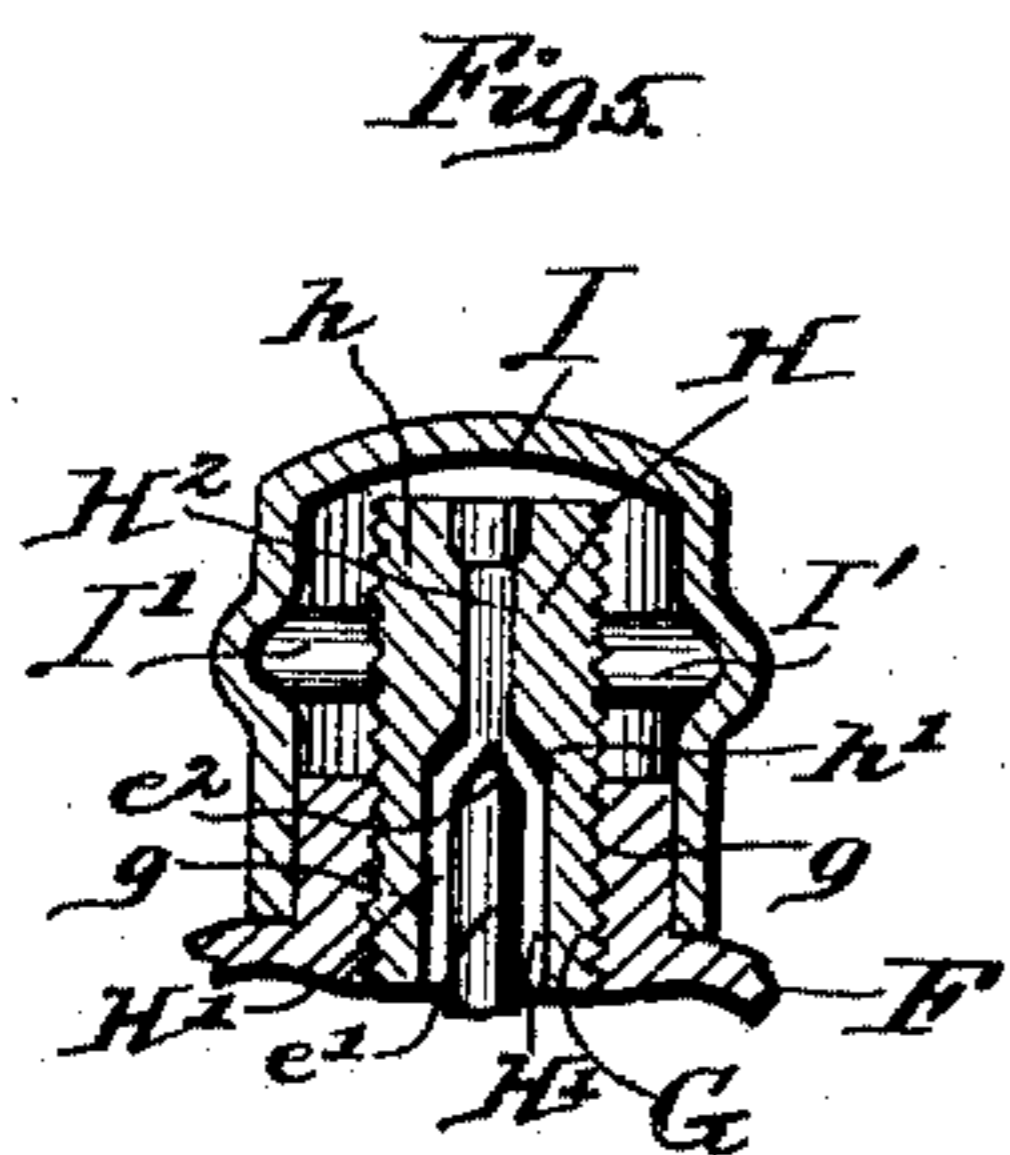
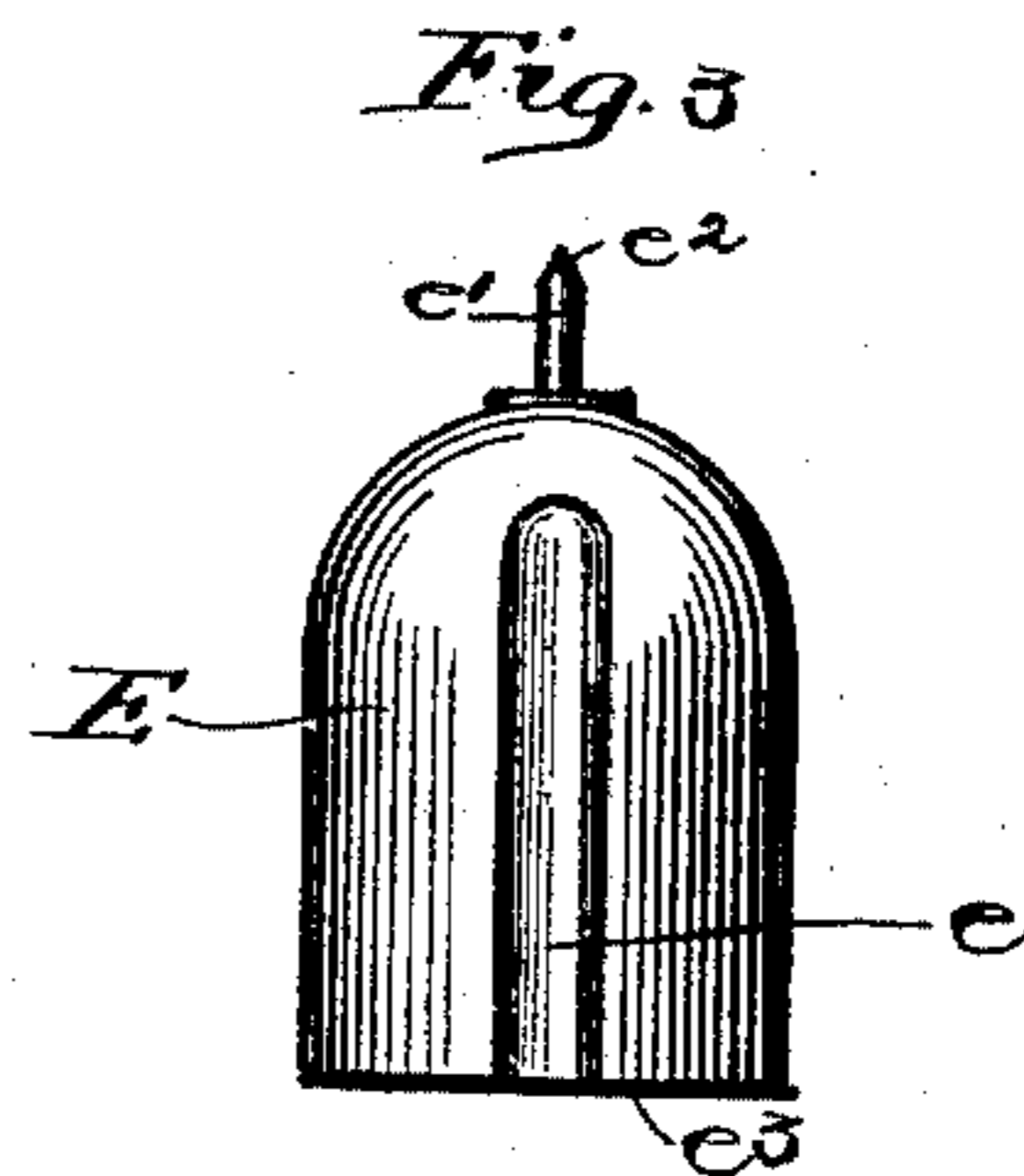
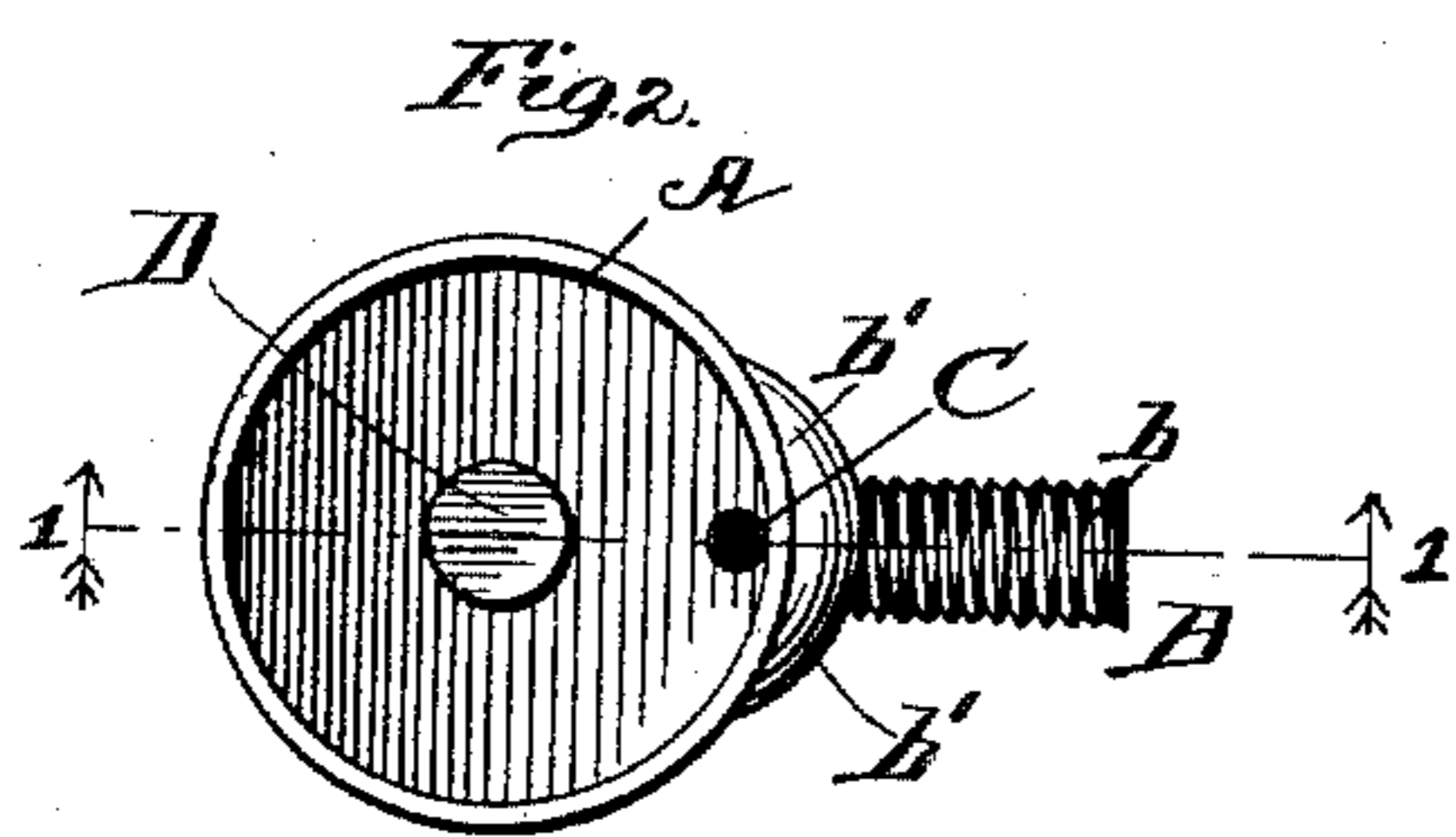
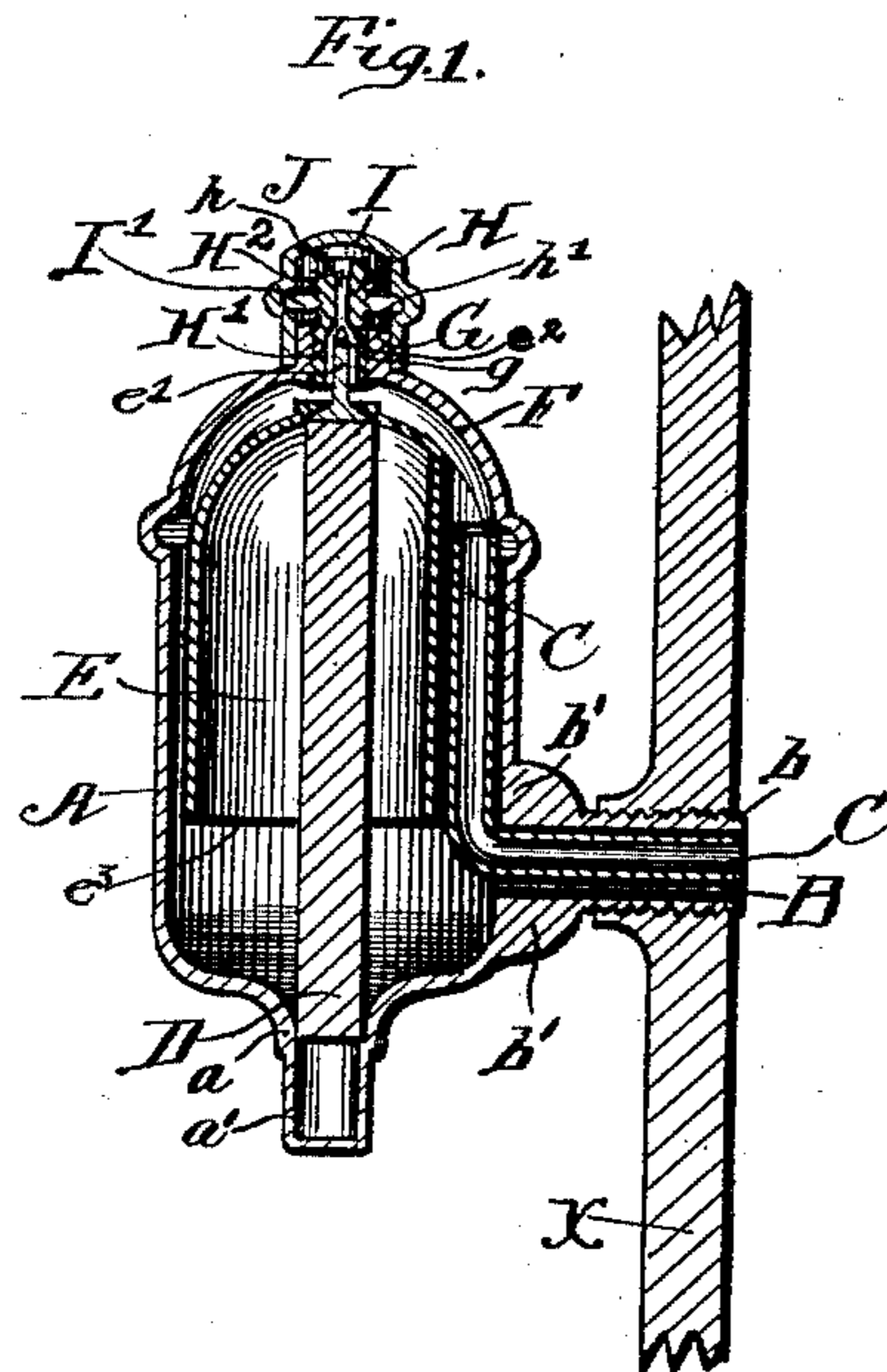


(No Model.)

C. E. VAN AUKEN.
VALVE.

No. 468,143.

Patented Feb. 2, 1892.



Witnesses;
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UNITED STATES PATENT OFFICE.

CLARENCE E. VAN AUKEN, OF CHICAGO, ILLINOIS.

VALVE.

SPECIFICATION forming part of Letters Patent No. 468,143, dated February 2, 1892.

Application filed August 15, 1891. Serial No. 402,718. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE E. VAN AUKEN, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valves, of which the following is a specification.

My invention relates to the class of valves used for automatically venting steam-radiators; and the object of my invention is to obtain a valve of the character described, adapted to be attached to steam-radiators, and to automatically open to allow air contained in the radiator to escape therethrough and to automatically close against the passage of steam or water.

This invention consists, chiefly, in improvements which are embodied in a construction of the valve whereby like results are obtained as in the valve described in the patent granted to me on the 9th day of December, A. D. 1890, No. 442,595, whereby a more durable and better working device is obtained and at less expense than in the construction set out in such patent, the principle whereon the valve set out herein is constructed being substantially the same as that upon which the device in said patent is based.

I have illustrated my invention by the drawings accompanying and forming a part of this specification, in which—

Figure 1 is a vertical cross-section of the device on line 1 1 of Fig. 2; Fig. 2, a plan view of the bottom outer casing of the device with the movable inner shell taken therefrom; Fig. 3, an elevation of such inner movable shell, and Fig. 4 an elevation of a protecting-cap used in the device. Fig. 5 is a cross-section, on an enlarged scale, of the valve at the top of the shell or case of the device.

The same letter of reference is used to indicate a given part where more than one view thereof is illustrated.

X is the wall of a steam-radiator.

A is a shell or case, preferably stamped, of soft brass or copper and having the hollow projecting end a a' at the lower end thereof.

B is a stem or tube threaded on the outside thereof, adapted to be brazed or soldered to shell or case A, and is preferably made of cast-brass.

b b are the threads on stem B, and b' b' are wings extending outward from the stem B,

forming the base of the stem and the means whereby it is fitted to the shell A.

C is a bent tube extending from about the upper end of the shell A downward to the opening or passage-way in the stem B, and from thence along horizontally in such opening in the upper part thereof to about the end of such stem, substantially as illustrated in Fig. 1.

D is a rod constructed of material adapted to readily expand under the influence of steam heat. In constructing the device I have found it advisable to use vulcanized rubber for such rod D. The rod D at its lower end is of about the diameter of the portion a of the shell A and is forced into such portion and held thereby.

E is an inverted bucket or hollow shell. The upper end of rod D extends upward to the under side of shell E and is adapted to support such shell thereon.

e is a groove in shell E of sufficient size to allow the vertical portion of the tube C to be loosely contained therein.

e' is a needle-valve stem on the upper end of shell E, and e^2 is a conical valve at the extreme upper end thereof.

e^3 is the lower edge of shell E. This shell or case E is made from sheet metal, preferably brass, stamped or spun up and forms an inverted cup-shaped float open at its lower end, which rests loosely on the vertical rod D and is adapted to be raised off therefrom when sufficient water is contained in the shell A by such water.

F is a cap adapted to fit over the upper end of the shell A and to be secured thereon by soldering or brazing.

G is a tube secured in the upper end of the cap F, and g g are screw-threads in the hole passing through tube G.

H is a screw having thread h thereon fitting into the threads g in tube G.

H' is a hole extending part way through the screw H. H² is a hole of lesser diameter extending the remainder of the way through such screw H, and h' is a cone-shaped shoulder at the point of junction of holes H' H², forming the seat of the conical valve e^2 .

I is a cap fitting over cap F, and I' is a slot or opening in cap I, through which air escaping through hole H' H² can pass.

The manner in which this device operates is as follows: When air is contained in the radiator to which the device is attached, such air may enter the device through the passage-way in neck B and also through the tube C and escape from shell A through the hole H' H^2 at the top of such shell. When water is contained in the radiator, it also can obtain entrance into the shell A through the passage-way in neck B and through tube C; but such water as enters the shell through tube C will fall to the bottom of such shell, gradually rising therein, and as it so rises floating the shell E from off the rod D, the valve e^2 thereby closing against the valve-seat h' , thus preventing the escape of water from the shell. When the water in the radiator falls below the opening of the tube C into the radiator, steam or air can and will pass through such tube C into the shell A, and the water contained in the shell will run out of the shell A through the passage-way in the stem B. If the air enters the tube C in the manner last described, when sufficient water has run out of the shell A to allow the float C to fall back on the rod D, such and other air can escape from such shell through the opening H' H^2 ; but if steam enters the shell A through such tube C the rod D will be expanded by the heat of such steam and the upper end of rod D will thereby move upward and maintain the valve e^2 against the valve-seat h' before the float C has dropped back on rod D, such valve thus remaining closed and such steam being thereby retained in shell or case A.

The screw H is adjustable in tube G by means of the screw-threads h , fitting in threads g , by turning it, and is so adjusted that the upward and downward movement of the shell E is a suitable distance to permit the escape of the air contained in the shell or case A and not to permit the escape of steam or water, the action of the water whereby the shell C is floated off the rod D and of the steam whereby the rod D is expanded and the shell C is forced upward sufficiently to close the valve e^2 against the valve-seat h' being arranged to act in time to prevent such escape of air or water from such shell or case. The stem e' , fitting loosely into hole H' and having the conical valve e^2 at the end thereof fitting against the valve-seat h' , has been found by me much more efficient and uniform in its action than a valve adapted to be forced against the lower end of a tube in the manner illustrated in the patent hereinbefore referred to, wherein the guide portion of the stem of the valve is forward of the valve and valve-seat

therefor, and the moving body of air escaping from the valve is contracted thereby in the passage-way therefor after having passed beyond the valve-seat, as by the construction described and illustrated herein the valve and valve-seat therefor can be made smaller than by the first-named construction—that is, of less diameter—thereby lessening the area thereof and reducing the pressure thereon, tending to close it while air is escaping therefrom from the air contained in the chamber of the device, and the direction of the moving body of air changed in its course in passing over the valve from a direction parallel, or nearly so, with the valve-stem to one at an angle thereto is not again brought in contact with the valve-stem, when, if at all, its original direction is resumed, and the tendency to induce movement in the valve, closing it upon its seat, heretofore existing, is largely obviated.

It is evident that where the passage-way in the stem B is large enough to dispense with the tube C or the horizontal part thereof (as, in fact, it can be made, but is not considered practical to make by me) the adjustable character of the valve and its particular construction described, with the valve fitting therein on the valve-seat, is of equal value as where such valve and valve-seat are used in an air-valve having the inlet and outlet passages made as hereinbefore described.

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

1. The combination, with the casing having an inlet and an outlet and a water-outlet, of a post of expansive material, an independently-movable float resting normally upon said post, and a valve carried by said float and adapted to close the outlet when moved either by the expansion of the post or by the presence of water in the casing, the inlet being located so as not to discharge into or beneath the float, substantially as set forth.

2. The combination, with the casing having an inlet and an outlet and a water-outlet, of a post of expansive material, an independently-movable float surrounding and adapted to rest upon said post, and a valve carried by said float and adapted to close said outlet, the inlet being located so as not to discharge into or beneath the float, substantially as set forth.

CLARENCE E. VAN AUKEN.

Witnesses:

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CHARLES B. HEBRON.