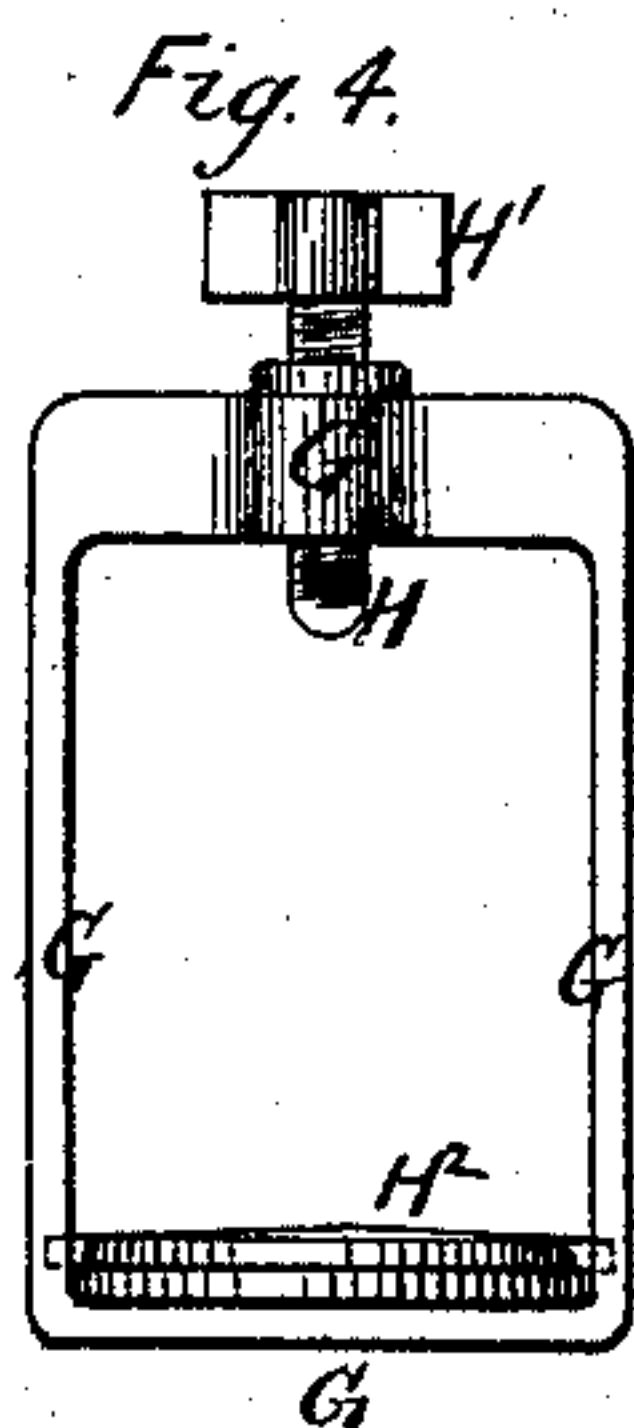
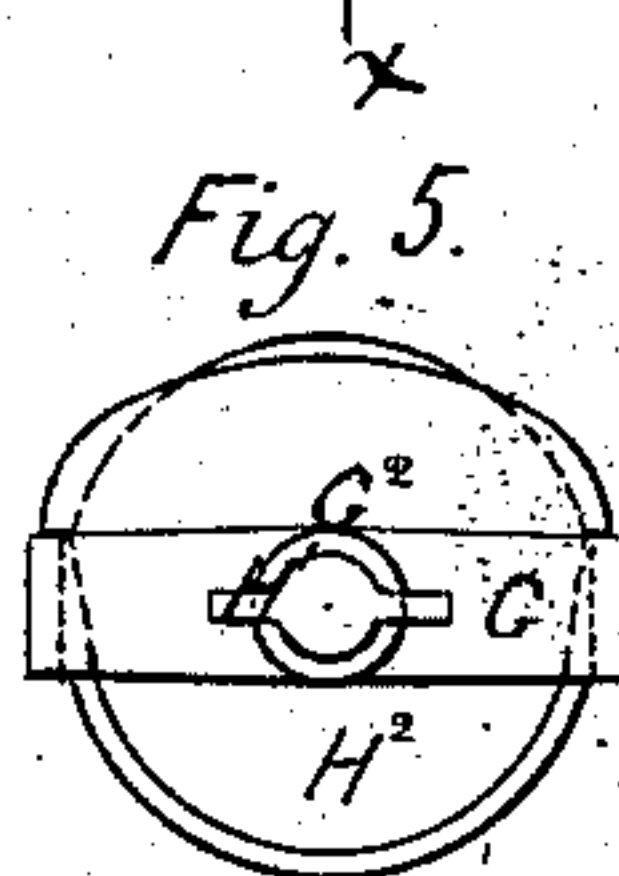
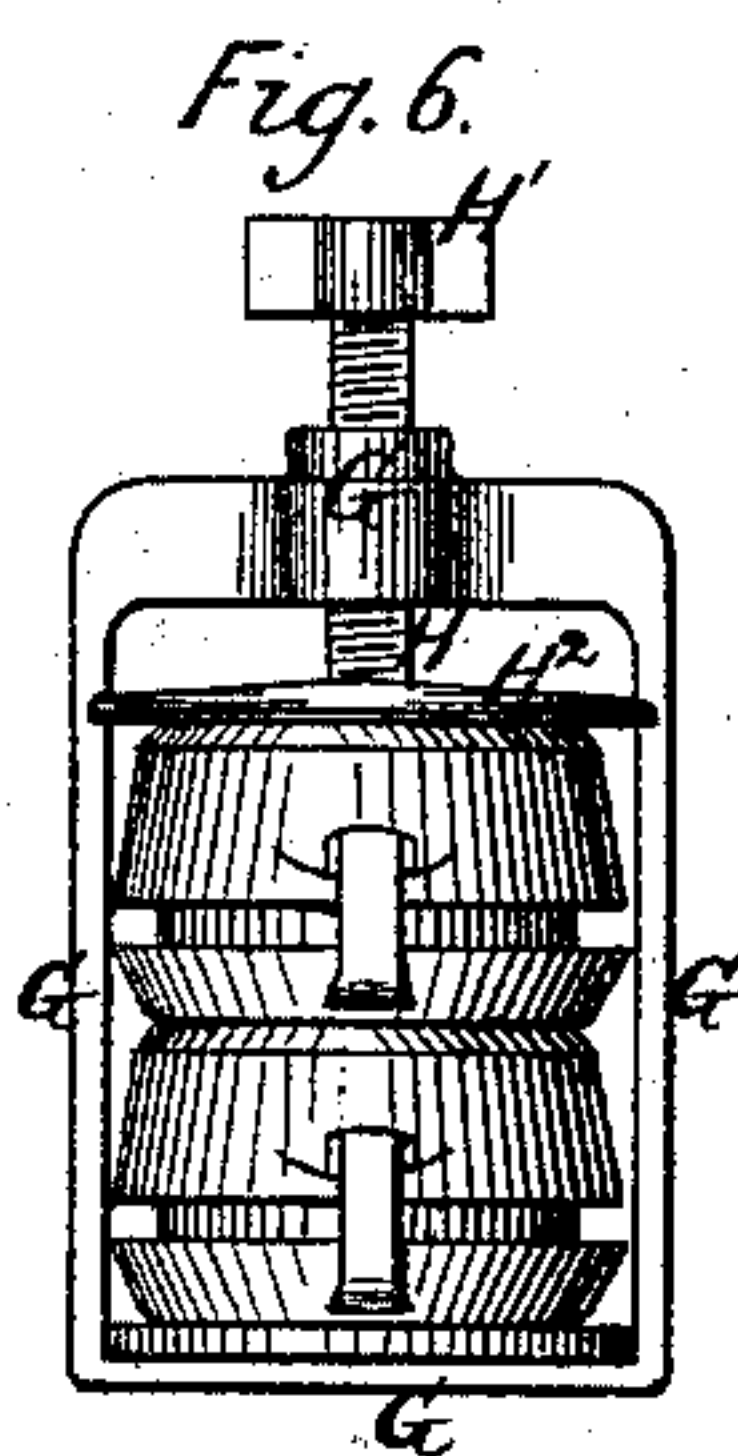
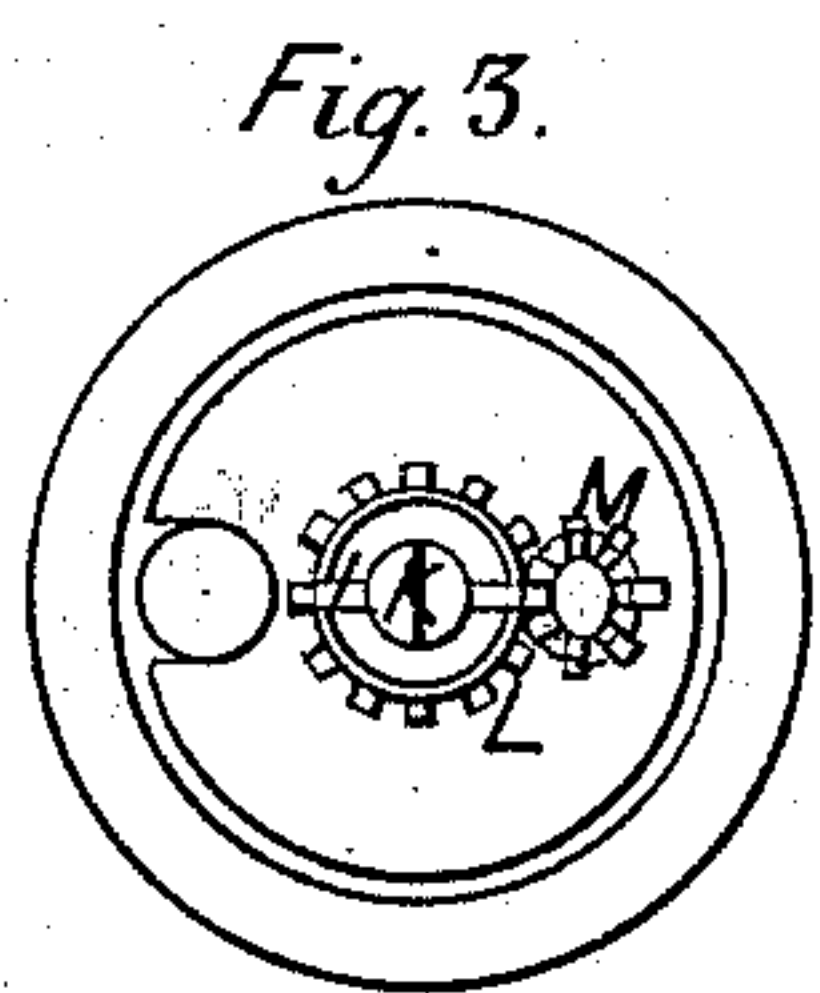
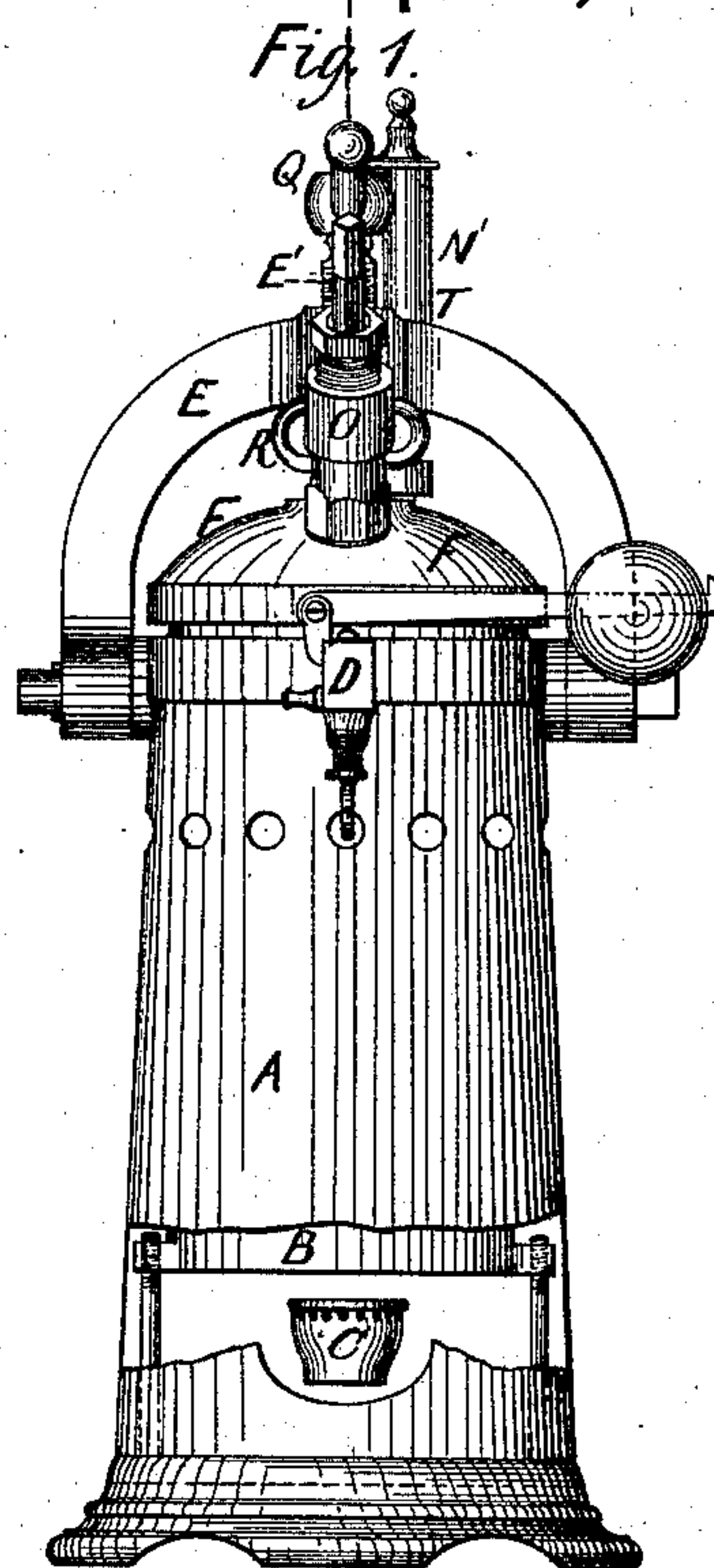
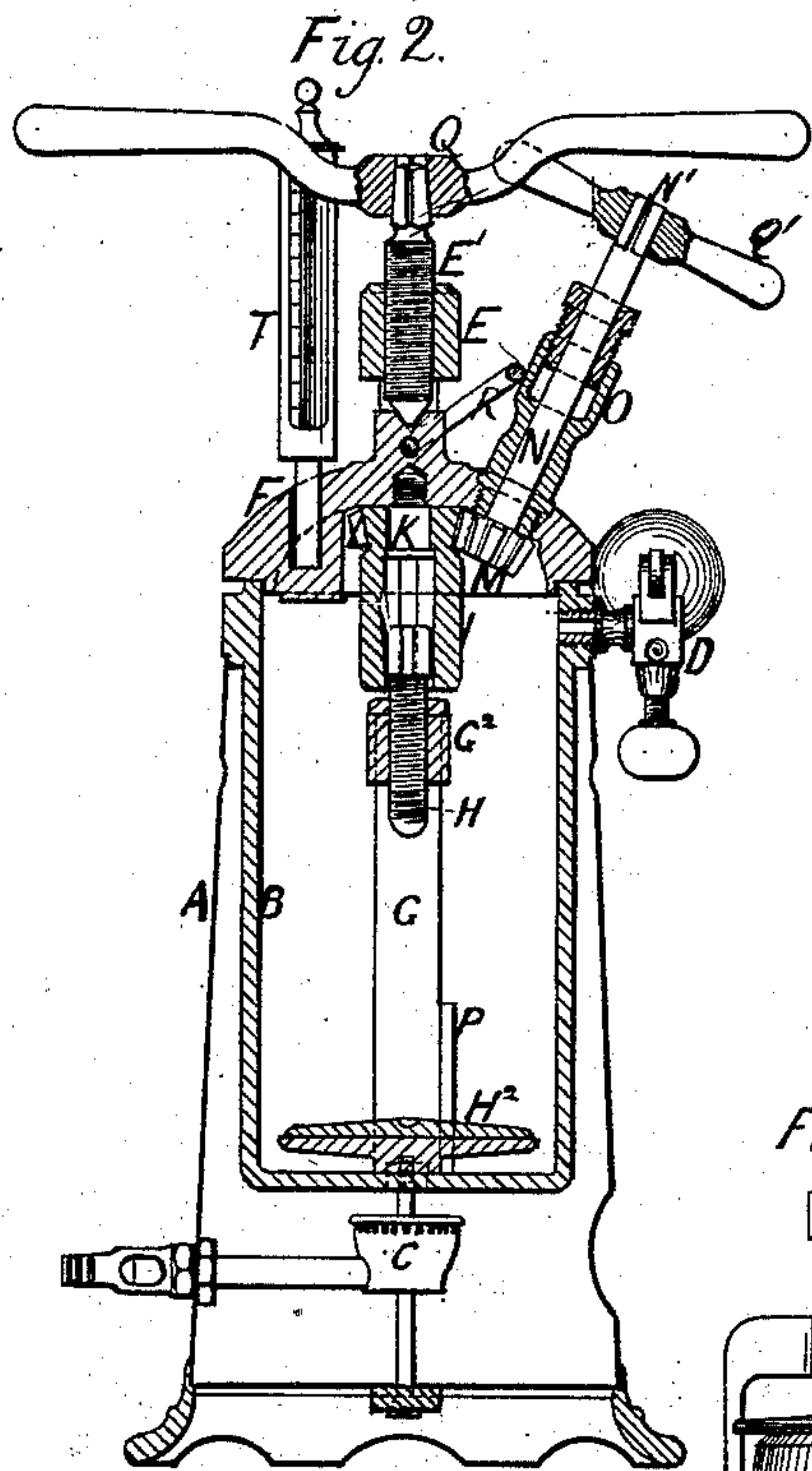


R. BREWSTER.  
Apparatus for the Treatment of Celluloid and  
Vulcanite in the Manufacture of Dental  
Plates and other Articles.

No. 219,382.

Patented Sept. 9, 1879.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

ROBERT BREWSTER, OF LONDON, ENGLAND.

## IMPROVEMENT IN APPARATUS FOR THE TREATMENT OF CELLULOID AND VULCANITE IN THE MANUFACTURE OF DENTAL PLATES AND OTHER ARTICLES.

Specification forming part of Letters Patent No. **219,382**, dated September 9, 1879; application filed February 25, 1879.

*To all whom it may concern:*

Be it known that I, ROBERT BREWSTER, of London, England, manager of the Dental Manufacturing Company, (limited,) of Broad Street, Golden Square, in the county of Middlesex, have invented a new and useful Improvement in Apparatus for the Treatment of Celluloid and Vulcanite in the Manufacture of Dental Plates and other articles molded under heat and pressure, also applicable to other useful purposes where pressure is to be applied in a closed chamber, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings—that is to say:

This invention relates to certain improvements in apparatus known as "vulcanizers"—that is, a heating apparatus, a press, and an inclosed retort known as the "boiler," in which the receptacle or "flask" containing the molds and plates or articles of celluloid or vulcanite are heated and subjected to pressure necessary for the molding of the plates or articles.

The object of this invention is to devise means whereby the flasks that hold the celluloid to be vulcanized may be retained under pressure after they have been removed from the vulcanizer and detached from the top plate thereof, so that a new set of flasks may be introduced within the boiler while the first set of flasks is cooling under pressure.

Another object of the invention is to provide means whereby flasks already under pressure may be still more or less compressed within the boiler.

The invention consists in the several improvements hereinafter more fully pointed out.

In order that the invention may be well understood, I have hereunto annexed a sheet of drawings illustrative thereof, wherein is shown the invention applied to a vulcanizer or apparatus for "cooking" celluloid or other dental plates.

Figure 1 is an elevation of vulcanizer apparatus; Fig. 2, a vertical central section on the line *x x*, Fig. 1; Fig. 3, a view of under side of the boiler lid or cover; Fig. 4, an elevation of clamp or stirrup piece forming the internal press-frame; Fig. 5, a plan or top view of Fig. 4; Fig. 6, an elevation of the clamp with two flasks therein, ready to be placed in the boiler.

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

The apparatus is shown constructed with a heating-chamber, A, formed of sheet-iron, and of a slightly conical, columnar, or other convenient form, in the upper end of which is set the retort or boiler B, and in the lower part of this said heating-chamber the heating device C (a Bunsen or other burner of ordinary or desired form) is arranged.

The retort or boiler B is fitted with a steam safety-valve, D, and has a hinged clamp, E, pivoted thereto, and provided with a center screw, E', which may be turned by a bar, Q, said hinged clamp being sufficiently wide to allow of its being adjusted over a steam-tight cover, F, and to admit of the center screw, E', acting directly upon the said steam-tight cover F to hold the same tightly and securely upon the boiler. T is a thermometer.

So far the apparatus is substantially the same as ordinary vulcanizers, but of improved arrangement of parts, for the purpose of facilitating the adaptation of the screw-press hereinafter described, and for rendering the apparatus more compact and handy for use.

It should be remarked that the pressure applied by the center screw, E', of the hinged clamp E of the boiler B is for the purpose only of holding the boiler-cover F tightly upon its seating, and not for applying the pressure upon or to the mold-flask, as heretofore has been the case, whereby the metal of the boiler will be relieved from the excessive pressure hitherto resulting in excess of or in addition to the internal steam-pressure.

The improved press and flask-holder—*i. e.*, the clamp which is placed within the boiler—is constructed and actuated as follows: A metal press-frame, G, (here shown as of stirrup form,) is employed, upon the lower bar or foot-plate, G<sup>1</sup>, whereof the flask (prepared or made up in the ordinary manner with the molds and plates to be molded and pressed) is to rest; and through a tapped collar or nut-piece, G<sup>2</sup>, of or in the arch of said stirrup-frame a center press-screw, H, with a squared or T-shaped head, H<sup>1</sup>, is passed and works, so that the foot of the press-screw shall press vertically upon the flask or mold, or upon a press-plate above the said flask or mold.



In the drawings, Fig. 4, the press-plate  $H^2$  is shown lying on the foot-plate  $G^1$  of the press-frame  $G$ ; but it may be attached loosely to the foot of the screw, so as to allow of the screw being turned, as in Fig. 6. The pressure upon the mold-flask to be effected by this press-screw  $H$  will be obviously exerted within the said stirrup press-frame  $G$  upon turning the press-screw  $H$ . Now, for effecting the turning of this said press-screw a slotted spanner or key,  $I$ , corresponding to or fitting the squared or T-shaped head  $H^1$  of the press-screw  $H$ , is provided at the extremity of a central pillar or projecting piece of metal mounted upon the under side of the cover of the boiler, so as to be free to turn around. In the drawings this central spanner,  $I$ , is shown secured by a screw-ended stud,  $K$ , screwed into the cover, said spanner or key  $I$  working around the smooth or plain portion between the head and screwed part of the said stud  $K$ . On the upper end of this rotary spanner  $I$  is a bevel-gear wheel,  $L$ , which gears with and is actuated by a second bevel-gear wheel or pinion,  $M$ , fitted upon a rod,  $N$ , made with a squared outer end,  $N'$ , and said rod  $N$  works through a steam-tight gland or stuffing-box,  $O$ , provided on the cover of the boiler.

It will be obvious that the lid or cover  $F$  may be varied in shape, and this stuffing-box  $O$  and rod  $N$  may be fitted at another angle to the rotary spanner  $I$ , the bevel-gearing being varied accordingly.

Ribs or projections are provided (as at  $P$ ) within the boiler, to keep the press-frame or clamp  $G$  from turning round when the power is applied to the press-screw. Any suitable stops will be provided for this purpose.

In use, when the apparatus has been heated up to the required degree of heat, which will be indicated by a thermometer, or be indicated and determined by a regulating pressure-gage of ordinary or desired construction, the pressure will be applied to the flask by actuating the bevel-gearing through the rod  $N$ , passing through the stuffing-box  $O$  to turn the spanner  $I$ , the slots whereof fit the head of the center press-screw, and are of sufficient length to allow of the head  $H^1$  sliding and descending within the spanner  $I$  as it is turned, and thus actuating the center press-screw and applying the pressure to the flask or matter between the press-plates and to the contents, such pressure being exerted, as before stated, and as is obvious, within the press-frame  $G$ —that is, between the foot of the press-screw  $H$  and the foot-plate  $G^1$  of the press-frame.

One or more flasks may be operated upon for the cooking and molding process within the same press or clamp, and as convenient or desired—that is, two flasks may be treated at the same time, as shown in Fig. 6; and any number of charges—that is, clamps and flasks, molds and plates—may be successively operated upon with the one boiler or heating apparatus without allowing it to cool down, as the pressure will remain constant upon the

flasks within the clamps and on the molded articles until cool and set, and without danger of their yielding or being damaged after or by their removal from the boiler. These pressure-retaining flask-clamps may be varied by providing the press-plate  $H^2$  with articulated or with pivoted catches or spring-catch pieces, which will gear with a rack or racks or stop-piece formed upon the side pillars or portions of the clamp or frame  $G$ . Thus, when the pressure is applied upon the flask the catches or springs will ride down the racks, and prevent the pressure being removed when the clamp is taken from the boiler and while the molded plates or articles are cooling. This arrangement of clamp may be used in the old forms or kinds of vulcanizers where direct pressure is applied.

Again, a pressure-retaining clamp may be formed upon the flask itself, as follows: Upon the lower portion of the flask, at opposite sides thereof, spring finger-pieces are riveted, and to the upper end of the said spring-pieces is attached a solid tooth or stop-piece, extending inward over and just above the top of the flask when same is closed, so that when the flask is brought close together in the process of molding under heat and pressure the said teeth or stop-pieces will, by action of the springs, be pressed inward and over the top of the flask when same is closed, and so retain the flask in a tightly-closed position and under pressure when same is removed from the heating-chamber.

A thermometer or steam-gage is provided on the cover or other part of the boiler, (in the drawings a thermometer only is shown,) to indicate the degrees of heat or pressure of steam obtained therein, which will also indicate the moment at which the pressure is to be applied. A two-handed key or spanner, as at  $Q'$ , is applied to the end  $N'$  of the rod  $N$ , said rod passing through the stuffing-box  $O$ , to actuate the gearing and to turn the press-screw and apply the pressure.

For actuating the press-screw  $I$  have described the means which I find to be most readily applied, and which I prefer to use in this class of apparatus; but, as before stated, the rod  $N$  and stuffing-box  $O$ , for actuating the internal press-screw spanner  $I$ , may be inserted at any position of the lid, or in some cases through the side of the boiler, according to the means employed for securing the lid  $F$  of the boiler on its seating, and the internal gearing will be varied accordingly. Again, when the mouth of the boiler, the clamp  $E$ , and cover are at the side of the boiler, as in Gartrell's apparatus, the rod  $N$  will form a portion of the spanner  $I$ , and the action upon the internal press  $G$   $H$  will be direct instead of through gearing.

$R$  is a ring supplied for convenience in lifting the lid or cover  $F$ .

This pressing and heating apparatus may be employed with slight modification of the receiver or flask in the preparation of tinctures



and extracts; and as a less degree of internal pressure will in some cases suffice within the boiler, and as none of the pressing force is applied thereupon, but is exerted only on the press contained therein, a glass, china, or porcelain boiler may be employed for such purposes. Again, this press-actuating device, consisting of the spanner I and rod N, working through the stuffing-box O in a boiler or retort, and actuating the press-screw H H<sup>1</sup>, may be applied with advantage to retorts or boilers of the kind known as "digesters."

Having now described the nature of my said invention, and given such directions as will enable the same to be carried into practical effect, I claim—

1. In a boiler, retort, or heating device, A, having cover F, the combination of the press-frame G G<sup>1</sup> G<sup>2</sup>, adapted to receive the flasks, with the screw H, having squared head H<sup>1</sup>, and with the spanner I, hung in the cover F, all being so constructed that the flasks may be compressed within the boiler A, and then removed in a compressed condition from the

boiler A and cover F, substantially as specified.

2. The combination of the heating-chamber A, having boiler B and cover F, with the presser-frame G, screw H, having head H<sup>1</sup>, and with the spanner I, stud K, cog-wheels L M, and rod N, substantially as specified.

3. The pressure-retaining clamp G, carrying the screw H, for pressing and holding flasks or mold-receptacles within a boiler, which has a cover, F, and for holding the charge under pressure while cooling, after the flasks have been removed from the boiler and disconnected from its cover, so as to leave the boiler in proper condition for receiving a new set of flasks, substantially as specified.

In testimony whereof I have hereunto set my hand this 2d day of January, 1879.

ROBERT BREWSTER.

Witnesses:

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