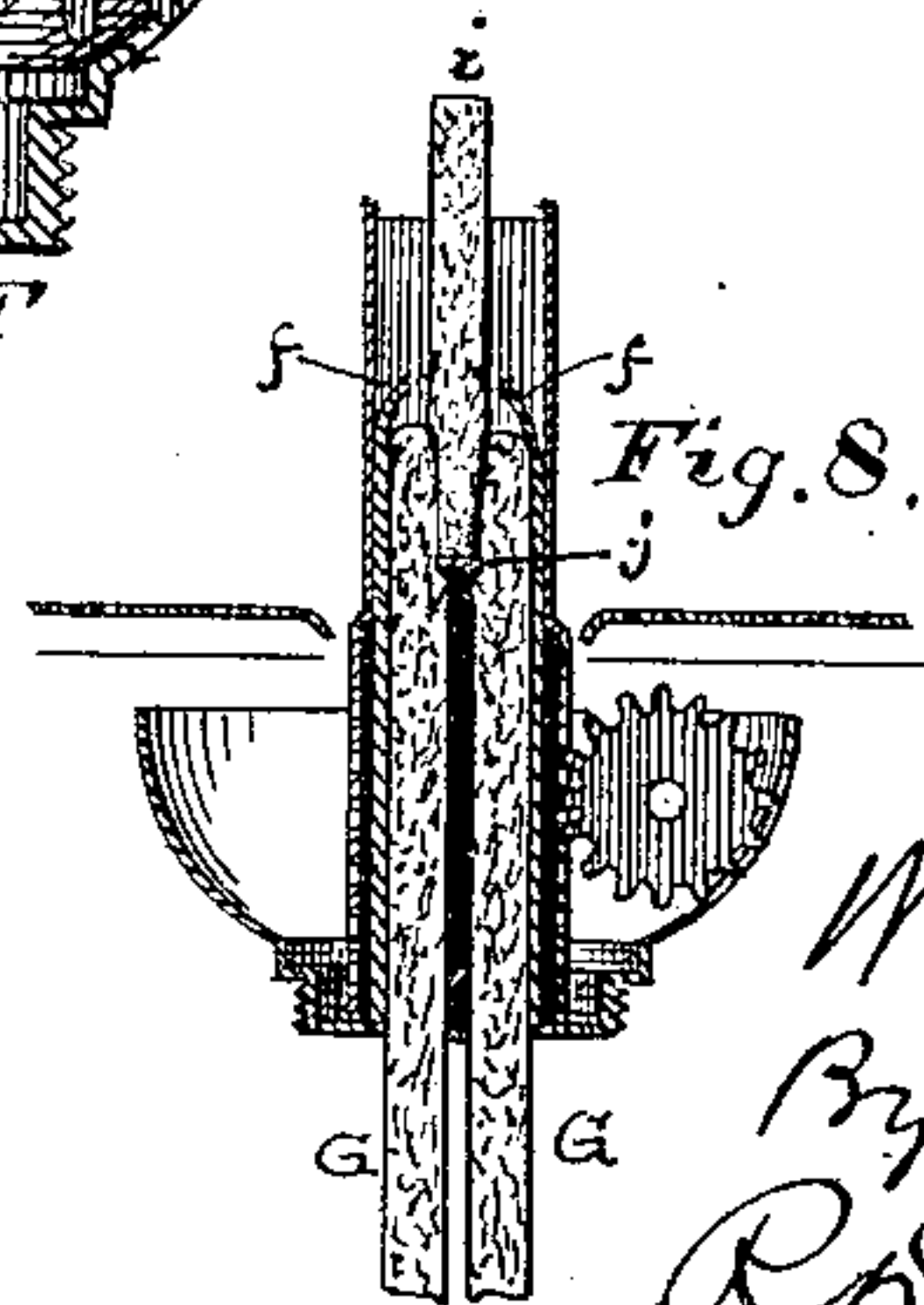
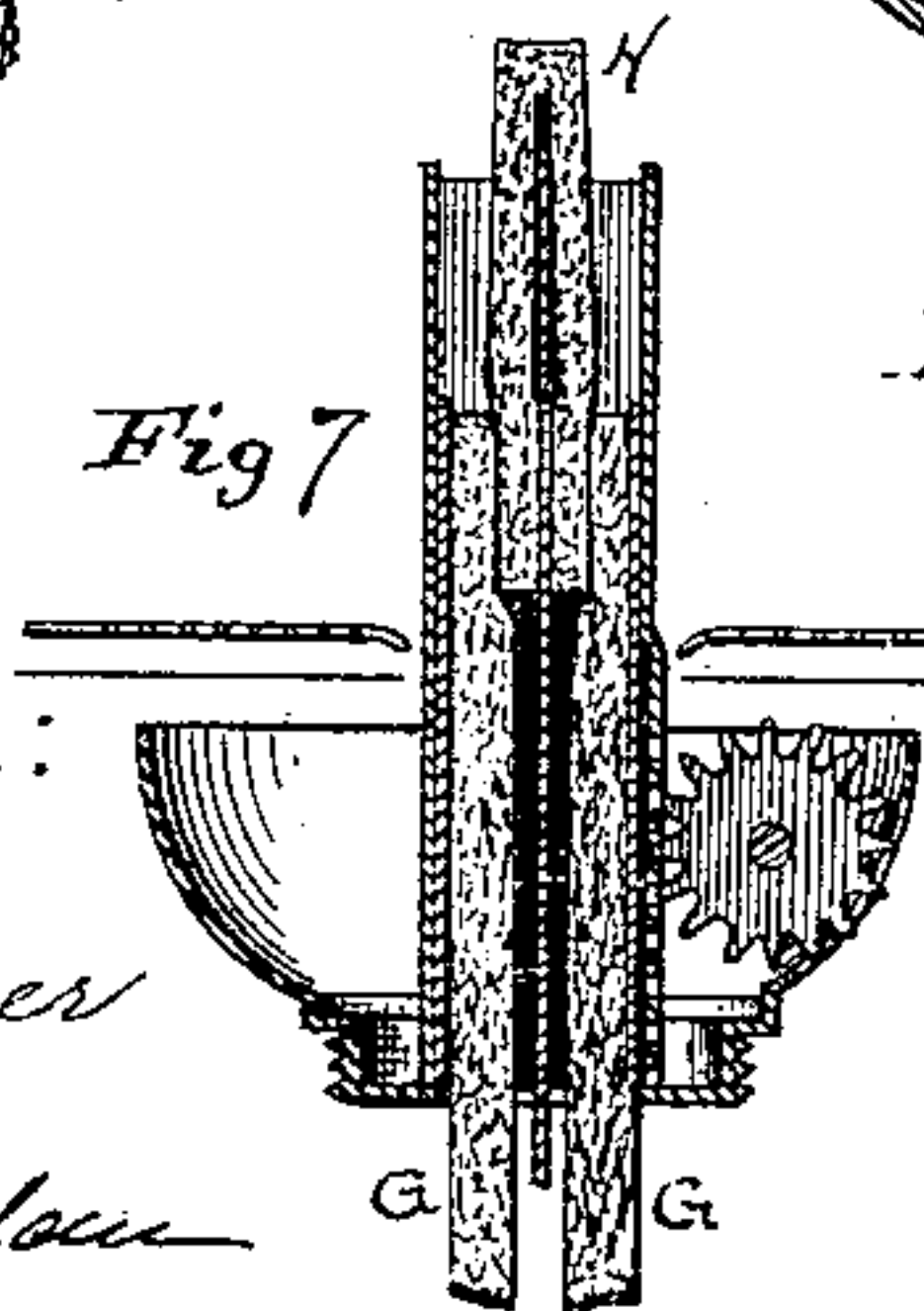
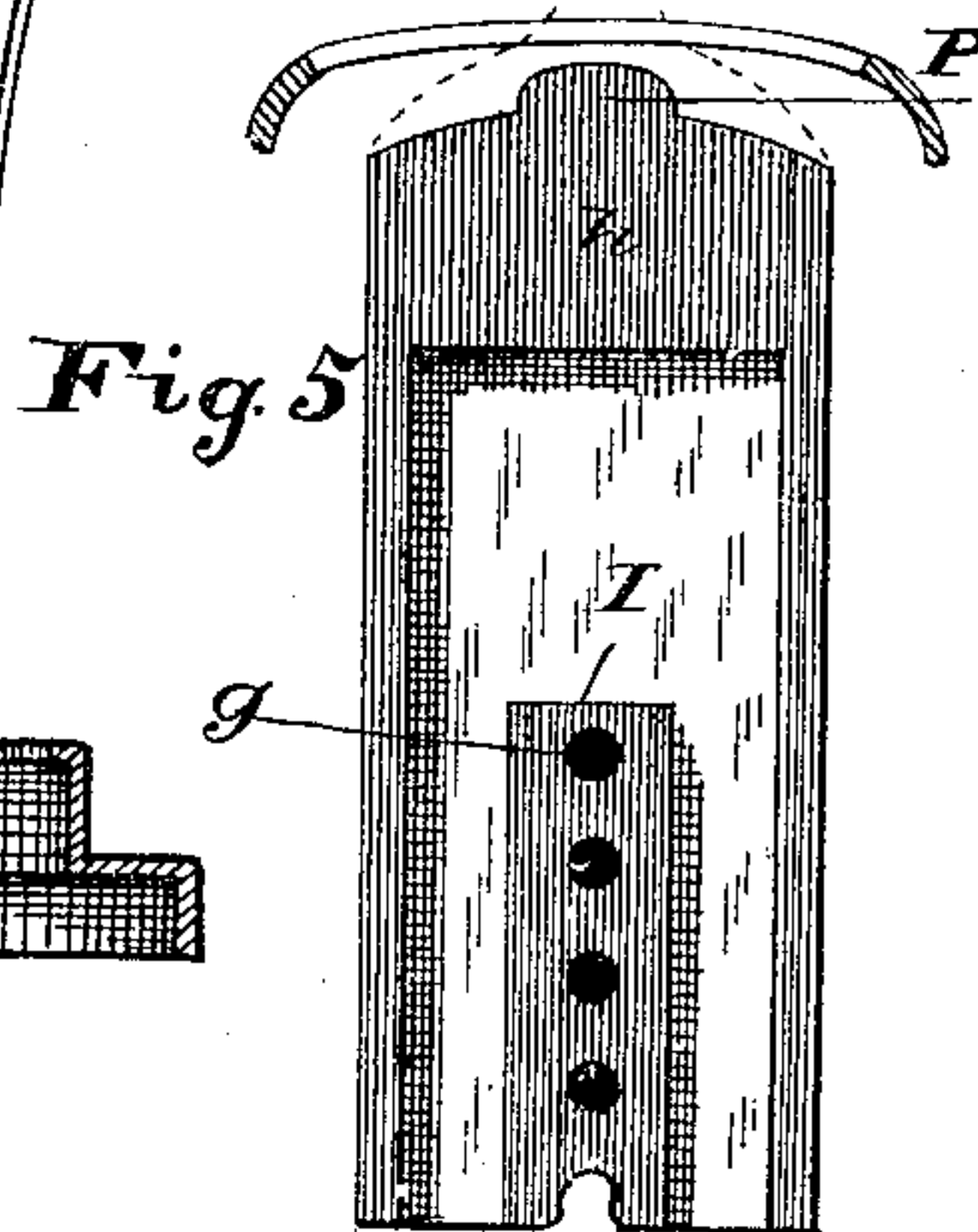
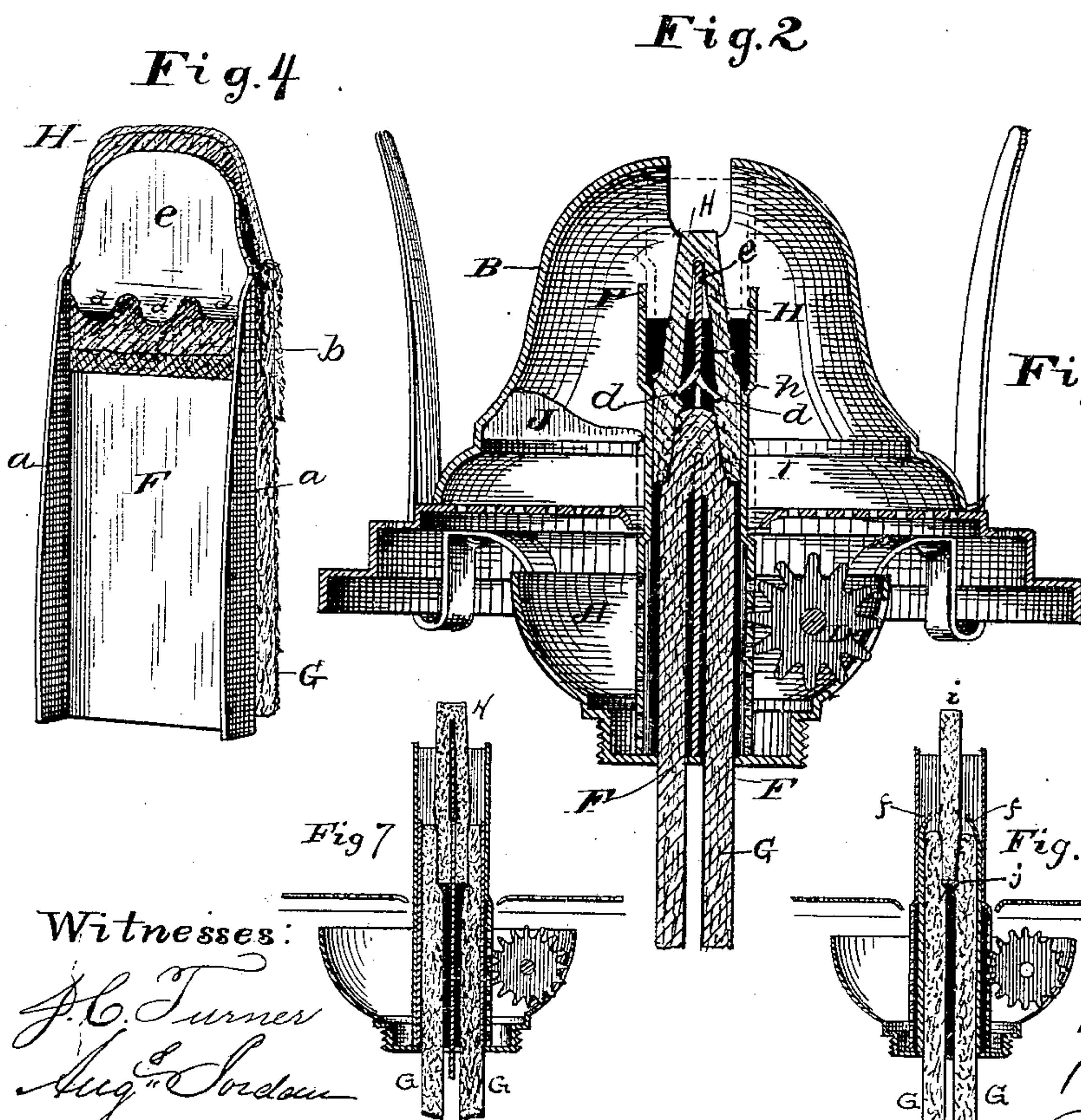
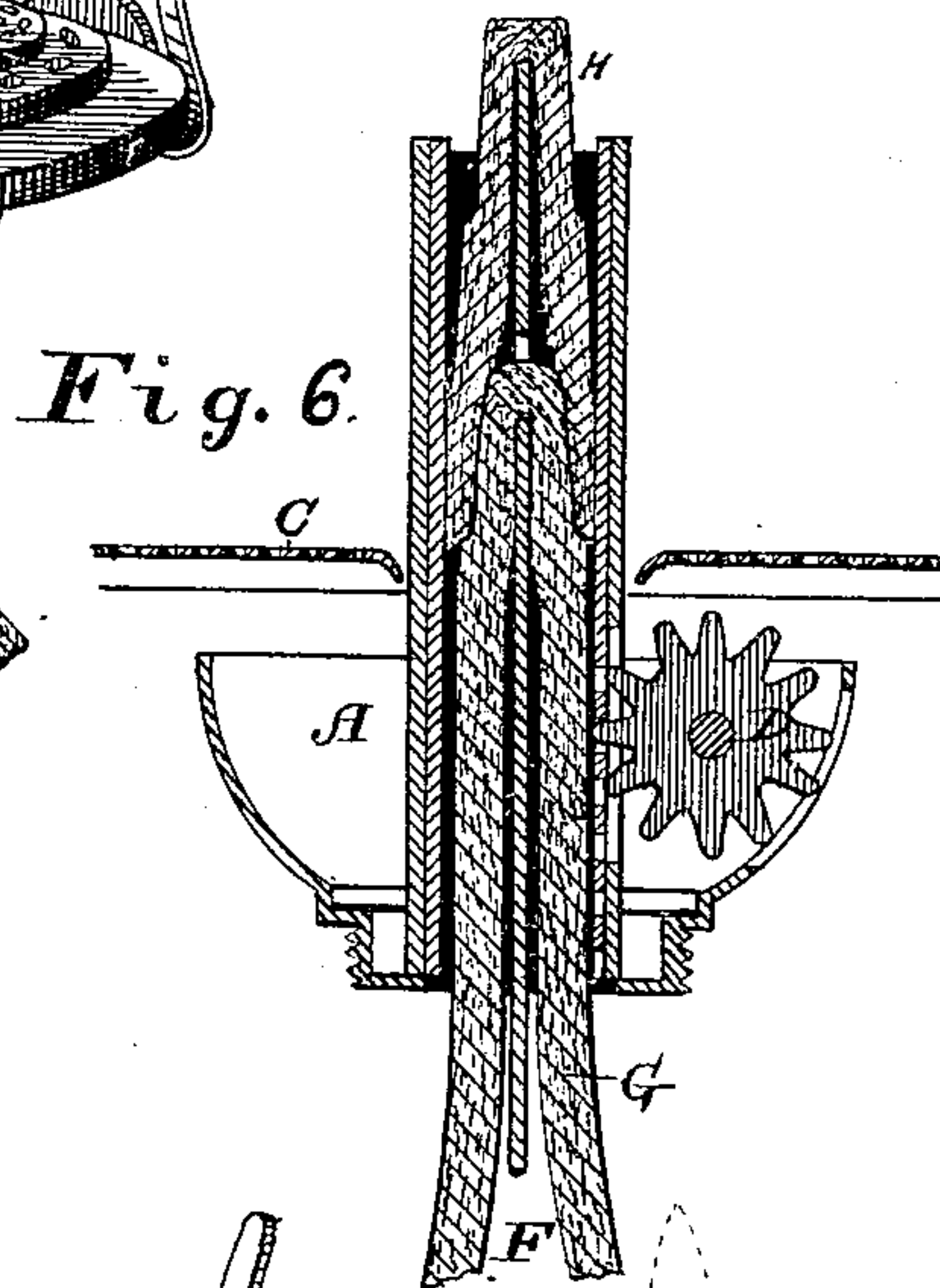
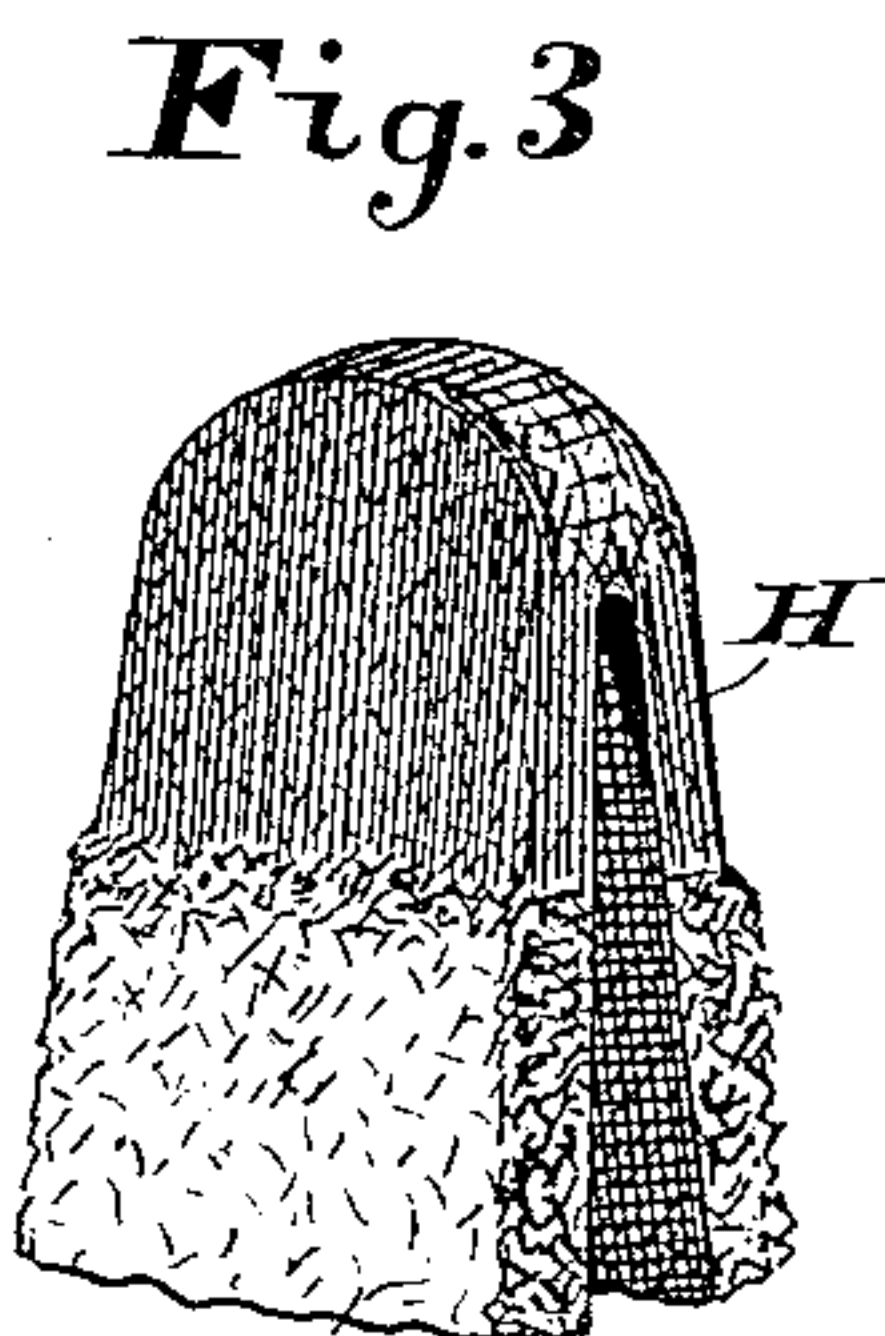
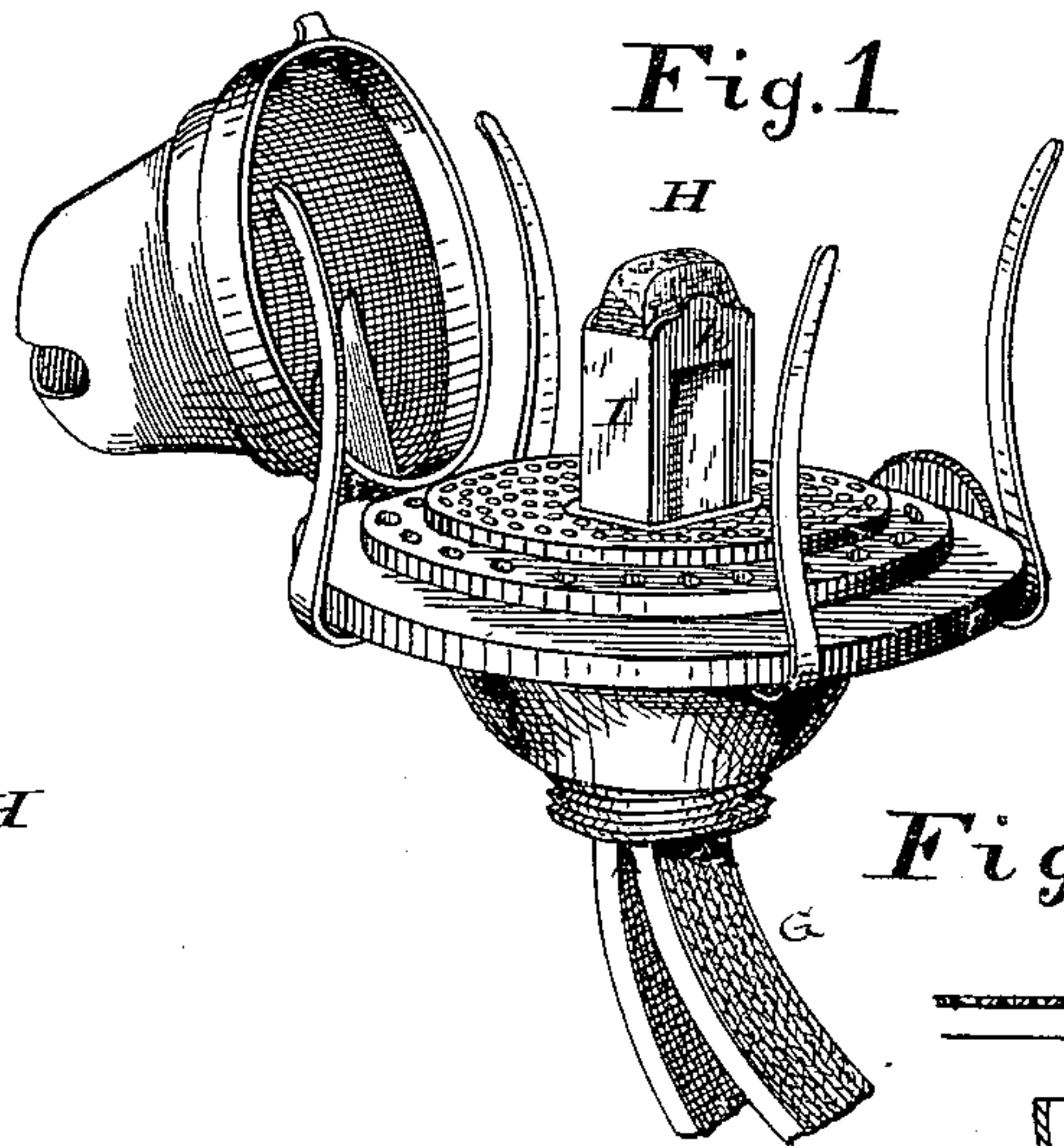


(No Model.)

W. PAINTER.
LAMP WICK AND BURNER.

No. 329,589.

Patented Nov. 3, 1885.



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UNITED STATES PATENT OFFICE.

WILLIAM PAINTER, OF BALTIMORE, MARYLAND.

LAMP-WICK AND BURNER.

SPECIFICATION forming part of Letters Patent No. 329,589, dated November 3, 1885.

Application filed June 4, 1884. Serial No. 133,793. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM PAINTER, of Baltimore, Maryland, have invented a new and useful Improvement in Lamp-Wicks and Burners Adapted Thereto; and I do hereby declare that the following is a full and accurate description of the same.

My invention relates, primarily, to the wick, and, secondarily, to the mechanism whereby the same is applied and operated in the burner; and its object is mainly to employ a removable-wick, of cotton or other vegetable fiber, in connection with a fixed or permanent supply-wick, and to so form the tip and adapt it to the supply-wick and burner that it will produce an even symmetrical flame free from smoke and smell, and, further, that the tips may be cheaply produced, easily and conveniently applied to the burner, their lasting qualities improved, and their effective contact with the supply-wick insured.

I am aware that it has been heretofore proposed to apply removable tips to burners, the oil being conveyed to the tip by a fibrous feeder, usually a piece of ordinary wicking. These tips have usually been made from non-combustible material, such as asbestos or other mineral fiber. Tips have also been made from ordinary flat wicking cut in short lengths. The non-combustible substances are not as good conductors of oil as vegetable film, and they are moreover expensive.

All removable tips heretofore made have been adapted only to set on the end of the supply-wick, with end contact therewith, solely. The free capillary action which is necessary to the successful performance to a lamp-burner is incapable of bridging over even a minute break of continuity, and it is difficult to obtain and maintain efficient end contact between the tip and the supply-wick. This forms a material defect, and one that is effectually overcome by my invention.

By my improved method of forming and adapting removable tips for use in connection with permanent supply-wicks I am enabled to employ cotton or other cheap fiber with excellent results, notwithstanding their destructible qualities, instead of the more expensive non-combustible ones. Tips so made by me have been burned in lamps for nearly one hundred hours without requiring renewal.

In the accompanying drawings, Figure 1 is a perspective of my burner with the cone turned back. Fig. 2 is a vertical central section of the same. Fig. 3 is a perspective of the removable wick-tip. Fig. 4 is a perspective of the central plate with tip and supply-wick in section. Fig. 5 is a side view of the regulating-sleeve; and Figs. 6, 7, and 8 are modifications of the invention.

A is the base of the burner, B is the cone, and C the air-plate, all of which may be of usual form.

F is a flat plate fixed centrally in the base of the burner, and serving as a support for the supply-wick and tip. The edges of the plate are bent to form right-angled flanges *aa*, as shown, to stiffen it. The flange also forms guides for the regulating-sleeve, holding it in engagement with the spur-wheel D. At a point in the plate F at a suitable distance below its upper end and above the level of the air-plate C there is a transverse slot, *b*, through which the supply-wick G is passed to the middle of its length, and its ends are passed down each side of the plate F into the lamp, as shown. This forms a convenient means for inserting and an effective means for sustaining the supply-wick in the burner. The object in placing the opening *b* at a distance below the top of plate F is to bring the end or fold of the supply-wick to such a distance from the flame as to prevent it from becoming charred. Above the opening *b* there are several retaining-spurs, *d*, formed by notching and turning the intervening metal outward toward different sides alternately, as shown in Figs. 2 and 4.

H is the tip, made in the form of a loop, with rounded end and pocket-shaped interior. (Shown in perspective in Fig. 3 and in section in Fig. 4.) The tip is formed from flat wicking of proper quality and width. After being moistened, it is forced by a flat plate of proper form into a hot die, where, under the influence of heat, moisture, and pressure, it assumes permanently the form shown. Several desirable objects are attained by so forming the tips; the curve conforms approximately to the shape of the cone, producing a flame with rounding corners, free from smoke, and perfect in its combustion, the pocket-shaped interior making the tip self-adjusting, forming an effective guide in placing it on its seat *e*

on the top of the plate F, which seat is rounded to conform to the shape of the tip. The pocket form of tip, moreover, causes it to entirely inclose the edges as well as the sides of the supporting-plate *e*, and thus prevents the flame from coming in contact with said plate, whereby the heat carried downward toward the lamp is diminished. The loop form of tip admits of its branches being conveniently brought into lateral contact with the supply-wick, while the tip is supported in the fold of its loop, thus insuring a uniform exposure of the end of tip, and a consequently uniform maximum flame independent of any variation in the lengths of the tips. When in position in the burner, the free end of the tip H extends down the sides of the plate F past the spurs *d d* and lap onto the sides of the supply-wick G below its fold through the opening *b*, so that there is necessarily a large surface-contact between said supply-wick and the tip, not at all dependent upon the exact portion of the tip upon its saddle-plate *e*, and an efficient supply of oil is insured under all circumstances. The tip H is secured in place by the regulating-sleeve I, which slides down over the tip and the wick G, and presses the tip closely against the retaining-spurs *d d* and against the supply-wick G, and thus insures the permanent holding of the tip in place by the spurs during the up and down movement of the sleeve I, and in intimate contact with the supply-wick as well, as shown in Fig. 2. The wicking of which the tip is made is preferably a little wider than the sleeve I, so that in placing the sleeve in position its lower edges bind against the edges of the tip and in its descent carry the tip snugly and evenly down on its seat. This is desirable, for if the tip were placed loosely in its seat and not forced down by the sleeve it would project too far above its top when the sleeve was at its lowest point, and so cause a smoking flame. When at its lowermost position, the regulating-sleeve I encounters a suitable stop so arranged as to bring the upper edge of the sleeve to such a distance below the top of the tip as to give the proper exposure of wick to produce the maximum flame desired, and this may be reduced at will by sliding the sleeve upward. This control is effected by the spur-wheel D, which engages with a series of holes, *g*, in the side of the sleeve. For convenience both sides of the sleeve are provided with holes, so that it may be put on with either side toward the spur-wheel.

While it is required that the sleeve shall press the tip closely against the spurs *d d* and against the wick G, as described, it is of advantage that it fit the tip loosely at its upper end, because it thereby avoids scraping the charred surface of the tip when the sleeve is raised. Such scraping would roughen the surface of the tip and produce an uneven flame. The top of sleeve I is therefore enlarged, as shown at *h*. The upper end of sleeve I is made

rounding to conform somewhat to the shape of the tip, and also to that of the cone, and thus gives the proper surface exposure of the tip and shape to the flame. It is frequently desirable to reduce the flame to a low point, either as a matter of economy or when it is required as a night-lamp. It is well known that imperfect combustion results in ordinary burners under such a condition, and an offensive odor is produced. I avoid this largely by placing on each side of the sleeve, at its top, a projection, P, Figs. 1 and 5, which, when the sleeve is raised to its highest point, as in Fig. 5, cut off the air-current from the base of the flame at its middle and cause it to impinge at and near its four corners. The effect is to cause an upward elongation of the center of the flame through the slot in the cone and the production of a small illuminating-point, as shown in dotted lines, Fig. 5, well adapted to the requirements of a night-lamp, and, by reason of the ample supply of air directed against the flame, as described, and close within the slot in the cone, comparatively free from offensive odor. When the sleeve is raised to its highest point, as described, it is not desirable that it should encounter the inner surface of the cone. I therefore provide a stop which shall at the proper point arrest the upward motion of the sleeve, and I find it convenient to place this stop, as at J, upon the cone B, engaging with a suitable shoulder on the sleeve I, so that when the cone is turned back upon its hinge the stop will be withdrawn and the sleeve I free to be lifted entirely off the burner, which is only done when it is necessary to replace a burned-out tip with a new one.

It will be seen by reference to Fig. 2 that the center plate, F, extends far enough above the air-plate C to bring the ends of the tip H clear of it, so that no obstruction is encountered in placing the tip upon its seat, as would be the case if the sides of the tip were allowed to extend below the level of the air-plate.

In forming the tips into shape, as previously described, it is only necessary that their upper part shall be exposed to pressure, (see Fig. 3,) the lower portions being left soft, giving a better and more uniform contact with the supply-wick.

Aside from the advantages before named resulting from giving the tips a fixed and uniform shape, as described, the pressure so applied condenses and solidifies the fibers, so that the tips may be handled without distorting them, greatly improving their lasting qualities and giving them a smooth regular surface, free from the natural fluffiness and irregularities of ordinary cotton wicking. Smoothness and regularity are of importance in securing a flame of uniform size and shape, and these qualities are due largely to the fact of the wicking of which the tip is made being doubled or folded, as described, so that the burning-point is at the middle of its length

when the fibers are uncut, and hence not disposed to fluff out.

In Figs. 6, 7, and 8 I have shown several modifications of the burner mechanism and tip. In Fig. 6 the center plate, instead of being fixed in the burner, is removable, and is withdrawn, together with the supply-wick and tip, when the latter is to be removed. In this case the outer tube is shown fixed, and there is a movable inner tube actuated by a spur-wheel, but not removable from the burner. The center plate, with its wick and tip in position, is pushed up into the inner tube, its upward motion being arrested by a suitable shoulder on the plate coming in contact with the end of the inner tube, and the parts are sustained in place by the friction of the wick and tip within the tube. The regulation of the flame is effected by the vertical movement of the inner tube, which carries with it the center plate, supply-wick, and tip. It is manifest that the inner tube may be fixed and the regulation of the flame effected by the movement of the outer tube, the latter arrangement more nearly realizing the advantages of the form shown in Fig. 2. In neither of these forms will the retaining-spurs on the central plate be required, as the movement of the regulating-sleeve will have no effect in displacing the tip. I may also modify the relation of the tip to the supply-wick by making the latter in two parts, one attached permanently to each of the inner sides of a fixed tube, leaving a space between the two sections of the supply-wick, as shown in Fig. 7. Into this space the removable center plate, with its tip in position, may be pushed up from below until the tip projects to the proper distance from the top of the fixed tube and its depending ends are pressed into contact with the inner surfaces of the supply-wick, the latter embracing the ends of the tip—an arrangement analogous in effect but the reverse of that shown in Fig. 2. A regulating-sleeve controls the flame. Fig. 8 shows the same means for holding the two sections of supply-wick, but in this case they are attached respectively to two spring-plates, *ff*, instead of to a fixed tube. When the regulating-sleeve is removed, these plates spring apart, allowing the tip *i*, which may in this case be made of a piece of ordinary flat wicking of single thickness, its end being preferably formed into rounding shape by pressure, as in the doubled tip already described, to be placed on its supporting plate or seat *j*. The ends of the springs *f* are curved inwardly to facilitate their entrance into the regulating-sleeve, which, when placed in position, closes the springs and wicks against and into lateral contact with the tip *i*. So, also, may approximately useful results be attained in my burner by using a tip made by simply doubling or bending a piece of ordinary flat wicking, not pressed into form, and applying it to the supply-wick, as already described; but none of these modifications, while conforming

to the spirit of my invention, will be as effective as the form first shown.

Having described my invention, what I claim is—

1. A removable wick-tip formed by doubling or folding a piece of flat wicking in the middle of its length, whereby the burning-point is fixed at the said bend or fold, substantially as set forth.

2. A removable wick-tip having its burning-point formed and pressed into shape, while its remaining portions are left soft and yielding, whereby effectual contact with the supply-wick is secured, substantially as set forth.

3. A removable wick-tip formed with a pocket-shaped interior, combined with and adapted to seat on a supporting-plate of similar form, whereby the tip is made self-adjusting as to position in the cone, substantially as described.

4. A removable wick-tip, composed of cotton or other similar vegetable or animal fiber, formed into proper shape at the tip or burning-point by heat, moisture, and pressure, substantially as described.

5. A center plate attached to the burner, provided with means for supporting the supply-wick, and an upward extension above said support for holding the tip, combined with a supply-wick and tip, substantially as described.

6. A tip-holder or supporting-plate located above the upper limit of the supply-wick, combined with a wick-tip seated upon said holder, and provided with pendent ends adapted to embrace the sides of the supply-wick, whereby the burning-point of said tip is removed to such a distance from the supply-wick as to prevent its charring, substantially as described.

7. A center plate provided with retaining-spurs, a supply-wick, and tip, in combination with an inclosing-sleeve adapted to press the pendent ends of said tip into contact with the retaining-spurs and supply-wick, substantially as described.

8. A supply-wick, means for supporting it in and near the top of the burner, and a removable wick-tip independently supported and held above said supply-wick, but pendent beside it, combined with a regulating-sleeve, which presses the pendent parts of said tip into contact with its holding devices and with the supply-wick, while said sleeve may freely move up and down to regulate the flame, substantially as described.

9. A wick-tip of rounding or convex form, combined with a regulating-sleeve having its upper end of similar shape, both conforming approximately with the interior figure of the cone employed, whereby a proper surface exposure of the tip and a perfectly-shaped flame are secured, substantially as described.

10. In combination with the burner-cone, a stationary wick and a regulating-sleeve having prolongations at or near the center of its upper edges, arranged to intercept the air-

currents at the middle of the flame, whereby a sharp and narrow flame is produced when the sleeve is at its highest point, substantially as described.

5 11. In combination with a stationary wick and a regulating-sleeve, a removable stop for limiting the upward movement of the sleeve and arresting it before coming in contact with the cone, substantially as described.

10 12. In combination with a stationary wick and a regulating-sleeve, a removable stop attached to the interior of the cone, whereby the stop is withdrawn when the cone is turned on its hinge, and the sleeve is free to be lifted
15 from the burner, substantially as described.

13. In combination with a removable wick-tip formed by bending or doubling a piece of flat wicking, a supply-wick bent or doubled

in a similar manner, and adapted to be embraced at its bend by the pendent ends of said 20 tip, substantially as described.

14. In combination with a supply-wick and a removable wick-tip, means for holding the tip in contact with the supply-wick, which means shall, in the act of being applied to the 25 same, also cause the tip to be carried down firmly onto its seat, substantially as described.

15. In combination with a wick-tip of loop form, a tip-supporting plate, inclosed at its edges as well as at its sides by said wick-tip, 30 whereby direct contact of the flame with said plate is prevented, substantially as described.

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