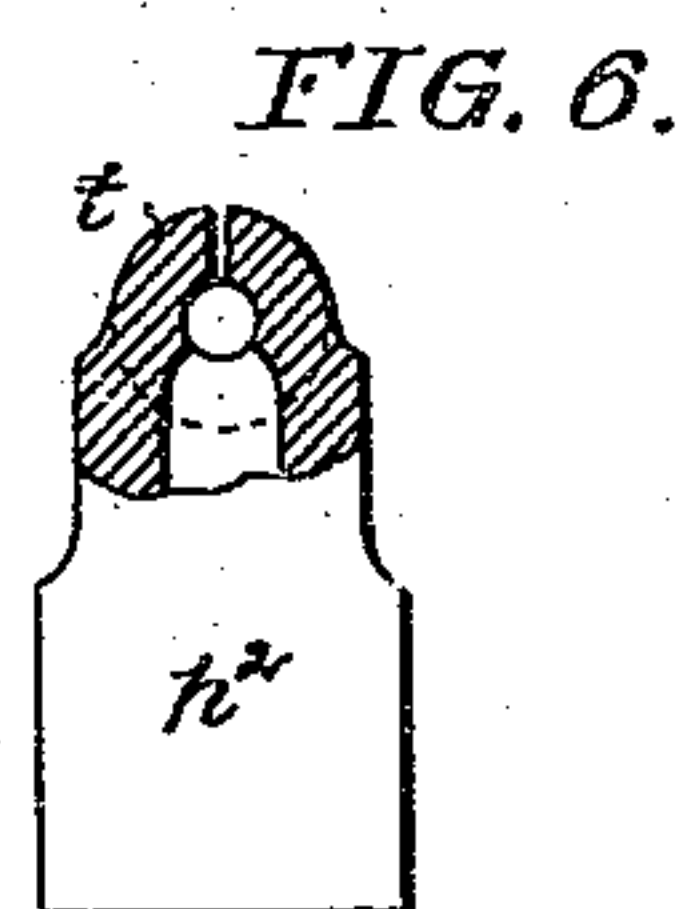
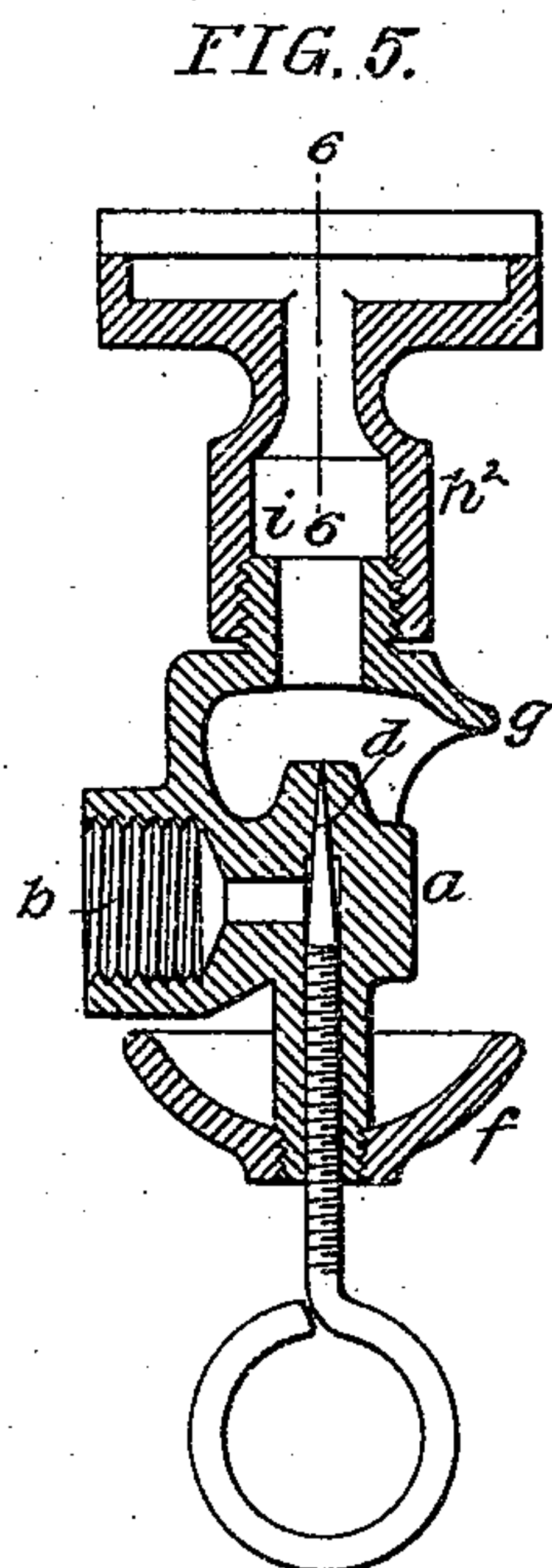
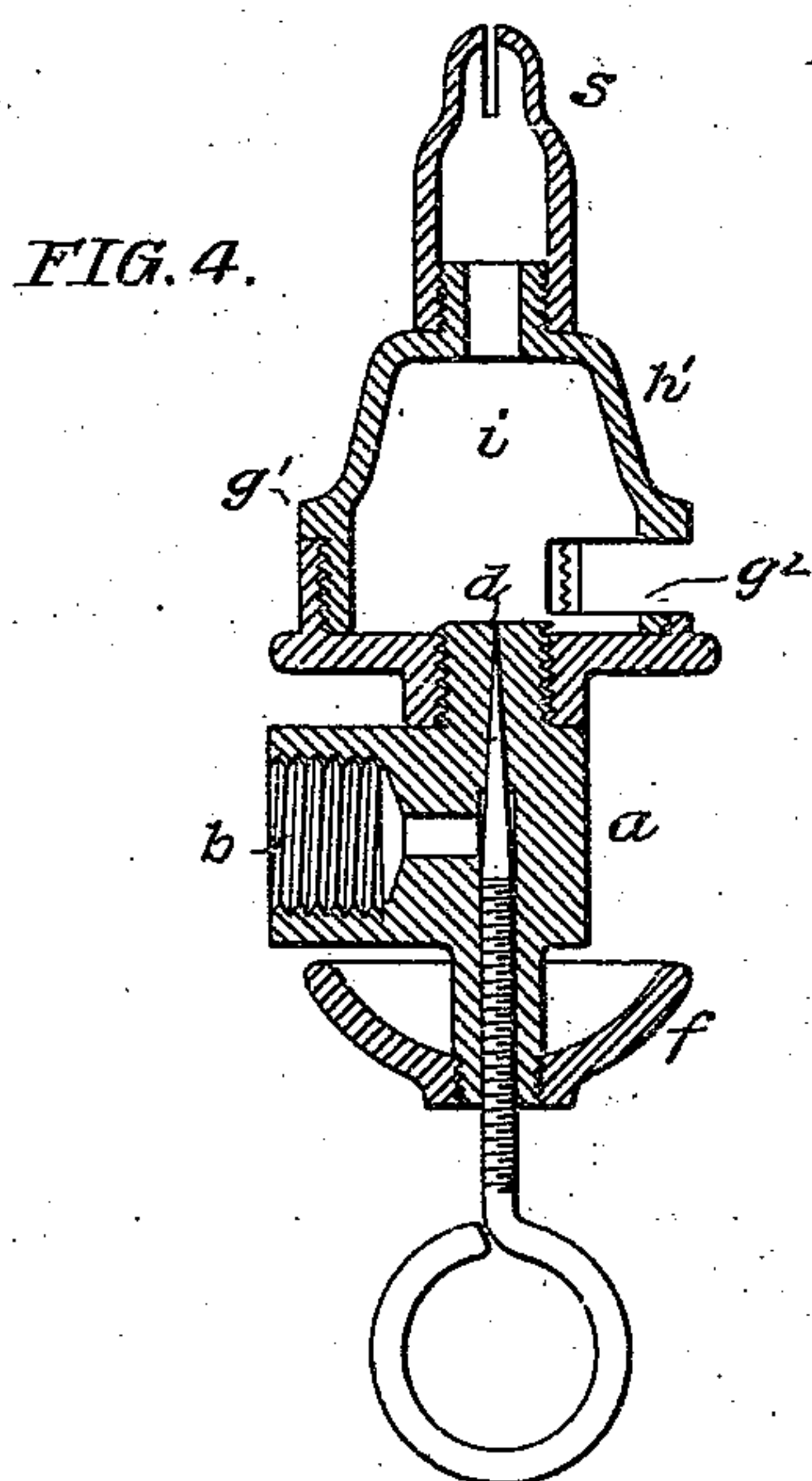
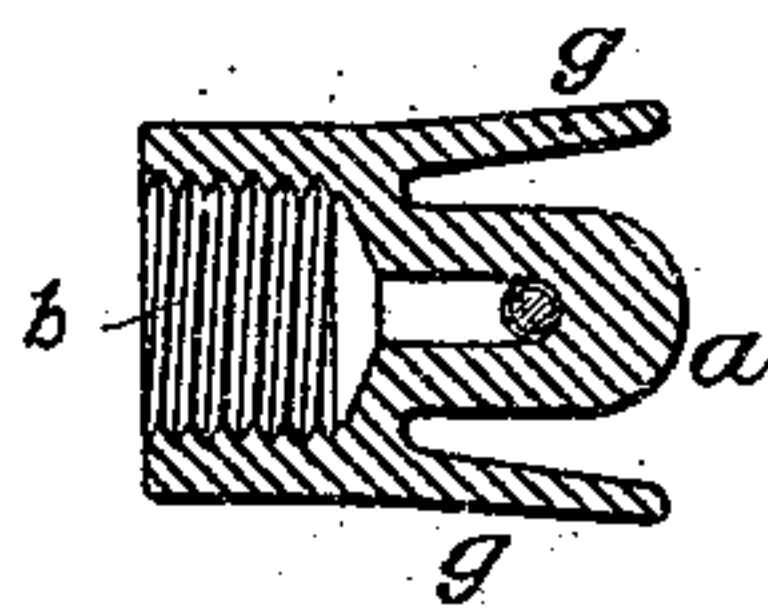
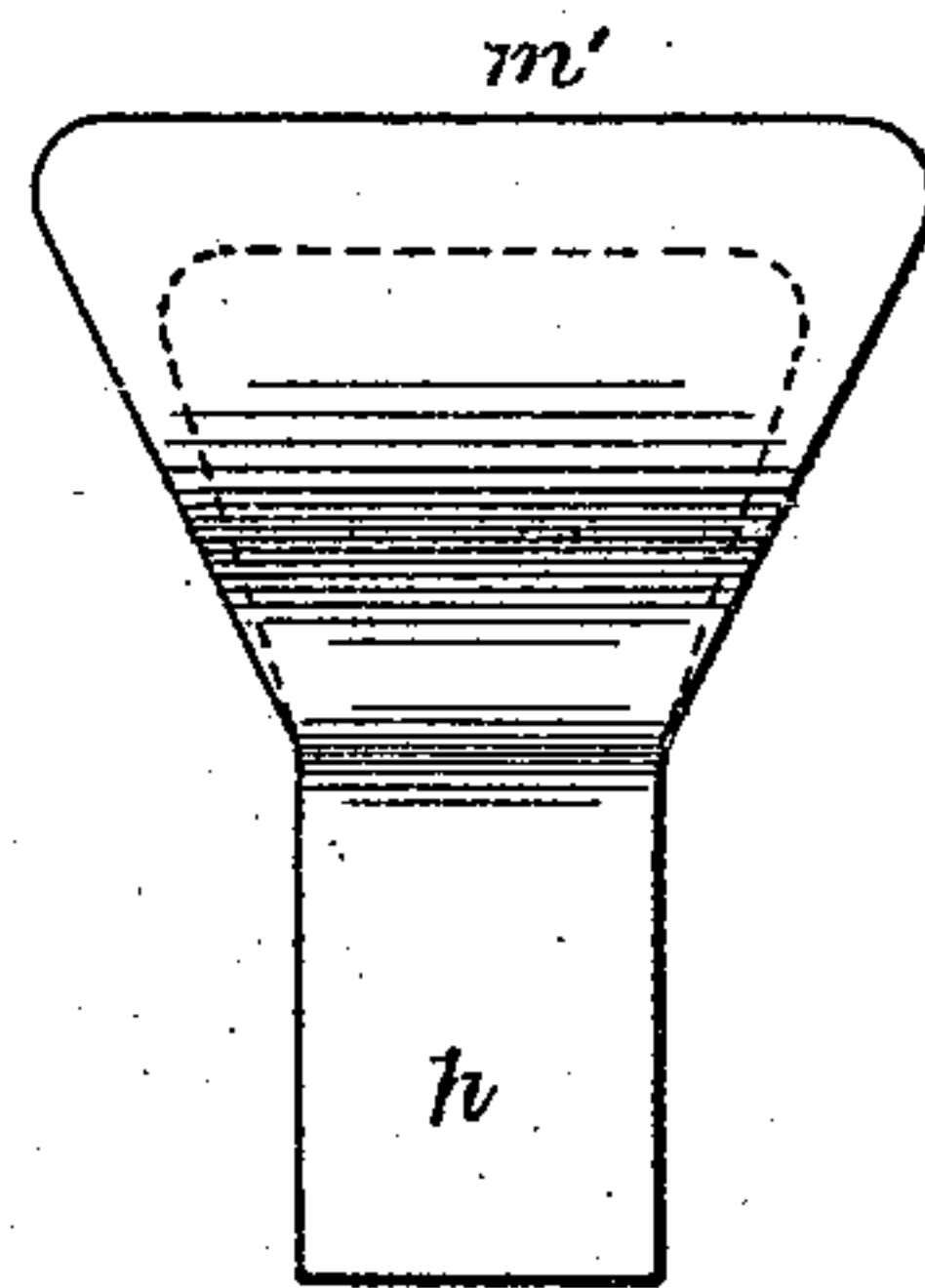
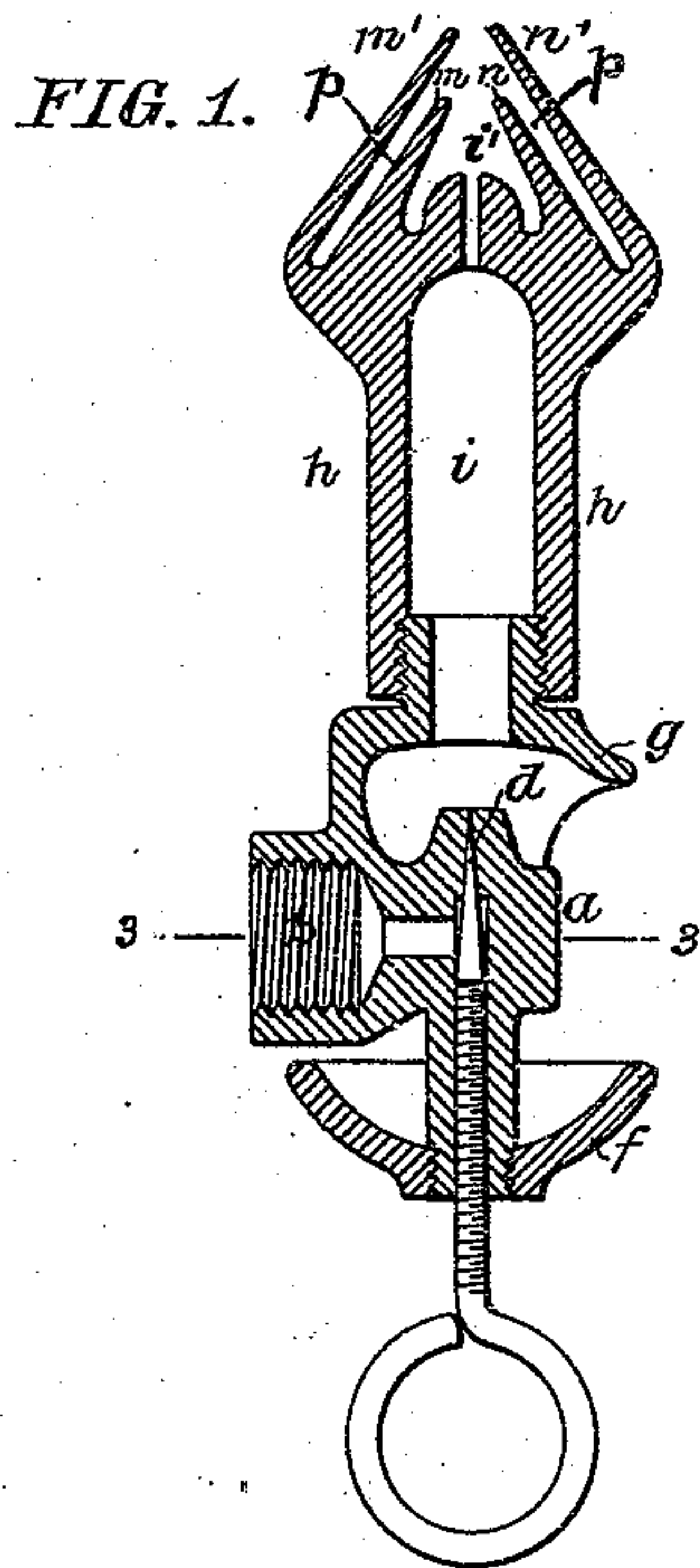


(No Model.)

H. F. SMITH.
SELF GENERATING GAS BURNER.

No. 551,656.

Patented Dec. 17, 1895.



Witnesses:
Hamilton D. Turner
Fred C. Benner

Inventor:
Harper F. Smith
by his Attorneys
Howan & Howan

UNITED STATES PATENT OFFICE.

HARPER F. SMITH, OF PHILADELPHIA, PENNSYLVANIA.

SELF-GENERATING GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 551,656, dated December 17, 1895.

Application filed November 13, 1894. Serial No. 528,665. (No model.)

To all whom it may concern:

Be it known that I, HARPER F. SMITH, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Self-Generating Gas-Burners, of which the following is a specification.

My invention relates to that class of burners which use gasoline or other highly-volatile hydrocarbon as an illuminant, one object of my invention being to so construct such a burner that while the needle-valve which regulates the flow of oil or vapor to the burner is well shielded from drafts or from rain or snow, it is readily accessible at any time without removing any portion of the burner, a further object being to provide for the effective heating of the burner so as to insure the proper vaporization of the oil and its transformation into a fixed gas before it issues from the burner. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a burner constructed in accordance with my invention. Fig. 2 is a side view of the upper portion of the burner. Fig. 3 is a sectional plan view on the line 3 3, Fig. 1. Fig. 4 is a sectional view of a modified form of the burner. Fig. 5 is a similar view of still another form of the same; and Fig. 6 is a transverse section on the line 6 6, Fig. 5.

The valve-chest *a* of the burner has at one side a threaded opening *b* for the reception of the supply-pipe communicating with an oil-reservoir, elevated or otherwise constructed so that the oil will gain access to the valve-chamber under pressure. The valve-chest is provided with a vertical needle-valve *d* and has, at the bottom, a depending stem carrying a cup *f* which may receive a supply of ignitable fluid in order to provide for the preliminary heating of the burner when it is not desired to ignite the oil directly as it issues from the valve-chest. Inclosing the upper portion of the valve-chest and its valve and extending forward at each side of the valve-chest is a hood *g*, open in front so as to permit ready access to the valve and valve-seat, but inclosing the valve on the remaining three sides, so that the point at which the oil issues

from the valve-chest is thoroughly protected from snow or rain and also from cross-drafts which would tend to extinguish the flame. Hence the burner can be used in exposed situations without risk of accidental extinguishing of the flame. Above the hood *g* is a tubular burner-body *h* inclosing a superheating-chamber *i* and having at the tip a slot *i'* for the escape of the gas, and on said tip are two pairs of wings *m m'* and *n n'*, one pair on each side of the slot, these wings being inclined toward each other from bottom to top and the wings of each pair being separated by a narrow space *p*. The flame issuing between the pairs of wings serves to highly heat both of the wings of each pair, this heat being transmitted to the burner-body *h* so as to superheat the vapor in the chamber *i*, the air which passes through the spaces *p* between the wings being also highly heated in order that it may mix with the gas issuing between the upper ends of the pairs of wings and thus insure the perfect combustion of said gas.

The wings *m m'* and *n n'* are flared laterally, as shown in Fig. 2, so as to increase their area and heat-absorbing surface. My invention may, however, be embodied in a burner having but a single pair of wings at one side instead of wings upon both sides, as shown, or the wings may be dispensed with altogether without departing from the main features of my invention. For instance, in Figs. 4 and 5 I have shown burners in which the wings are so dispensed with.

In the construction shown in Fig. 4 the burner-tube containing the superheating-chamber and the hood for shielding the valve are combined in one structure of dome-like character, the lower portion *g'* of this structure having in front an opening *g''* for permitting access to the valve, and the upper portion *h'* of the structure inclosing the superheating-chamber *i*, the tip *s* used in this case being similar to an ordinary gas-tip.

In the construction shown in Fig. 5 the same form of shield for the valve is used as in Fig. 1; but the hood is surmounted by a burner-tube *h''* containing the superheating-chamber *i* and having at the top a transverse tube *t*, having a contracted bore and a top slot communicating therewith so as to provide for the lateral spreading of the flame.

It will be evident, therefore, that various forms of burner-tips may be used without departing from the essential features of my invention, although the form of tip shown in Fig. 1 is preferred and is made the subject of a special claim.

In all forms of the burner which I have illustrated, however, the hood which inclosed the needle-valve contains a chamber of large area into which the jet of hydrocarbon vapor from the needle-valve is projected upward, and this chamber communicates through a contracted neck with a chamber above and of larger area than said contracted neck, the latter chamber communicating with the outlet of the burner. The jet of air from the needle-valve crossing the chamber within the hood or shield carries with it a certain amount of air, and this combined jet of hydrocarbon vapor and air is projected through the contracted neck above the chamber within the shield, so that the air and vapor are intimately mixed in passing through said contracted neck, and on issuing from the latter are permitted to expand in the chamber above the neck so as to rapidly absorb heat from the walls of said chamber preparatory to escaping through the burner-opening at the top of said expansion-chamber.

While I do not, therefore, claim broadly a burner having a needle-valve shielded on three sides, I claim as my invention and desire to secure by Letters Patent—

1. A self generating gas burner in which are combined a valve chest having a valve discharging upwardly, and a protecting dome or hood inclosing said valve except at one side and containing a chamber in which air can

surround the jet issuing from the valve, said hood having at the upper end and above the needle valve a neck contracted in area as compared with the area of the air inlet, and supporting a burner body containing a chamber of greater area than the neck, which chamber communicates at its upper end with the outlet opening of the burner tip, substantially as specified.

2. The combination of the slitted burner tube and a pair of wings carried by said tube and located on one side of the same, both of said wings being inclined in the same direction toward the flame issuing from the burner, the space between the inner wing and the burner tube, and also the space between the two wings being closed at the bottom, but open at the ends, substantially as specified.

3. The combination of the burner tube with two pairs of wings carried by said tube, one pair being located on one side of the burner tube and inclined in one direction toward the flame issuing from said tube, and the other pair being located on the opposite side of the burner tube and inclined in the opposite direction toward the flame issuing therefrom, the spaces between the inner wings and the burner tip and also the spaces between the wings of each pair being closed at the bottom, but open at the ends, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HARPER F. SMITH.

Witnesses:

FRANK E. BECHTOLD,
JOSEPH H. KLEIN.