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Patented Nov. 4, 1902.

A. G. KAUFMAN.  
SOLDERING IRON.

(Application filed Dec. 13, 1901.)

(No Model.)

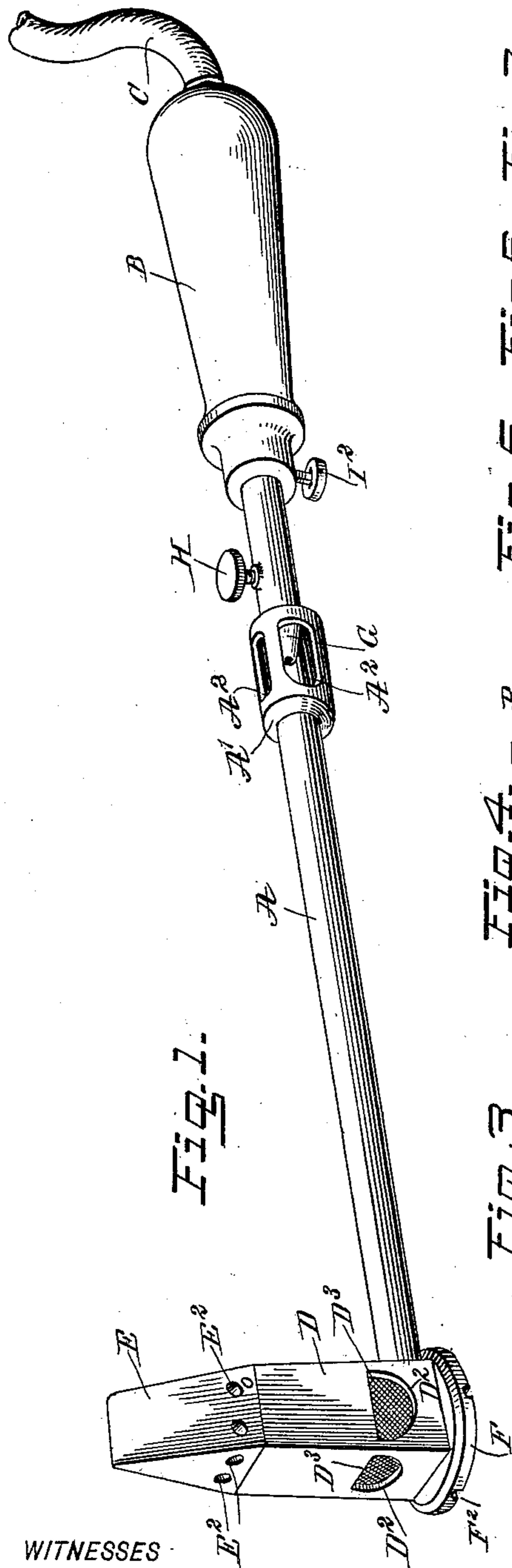


FIG. 1.

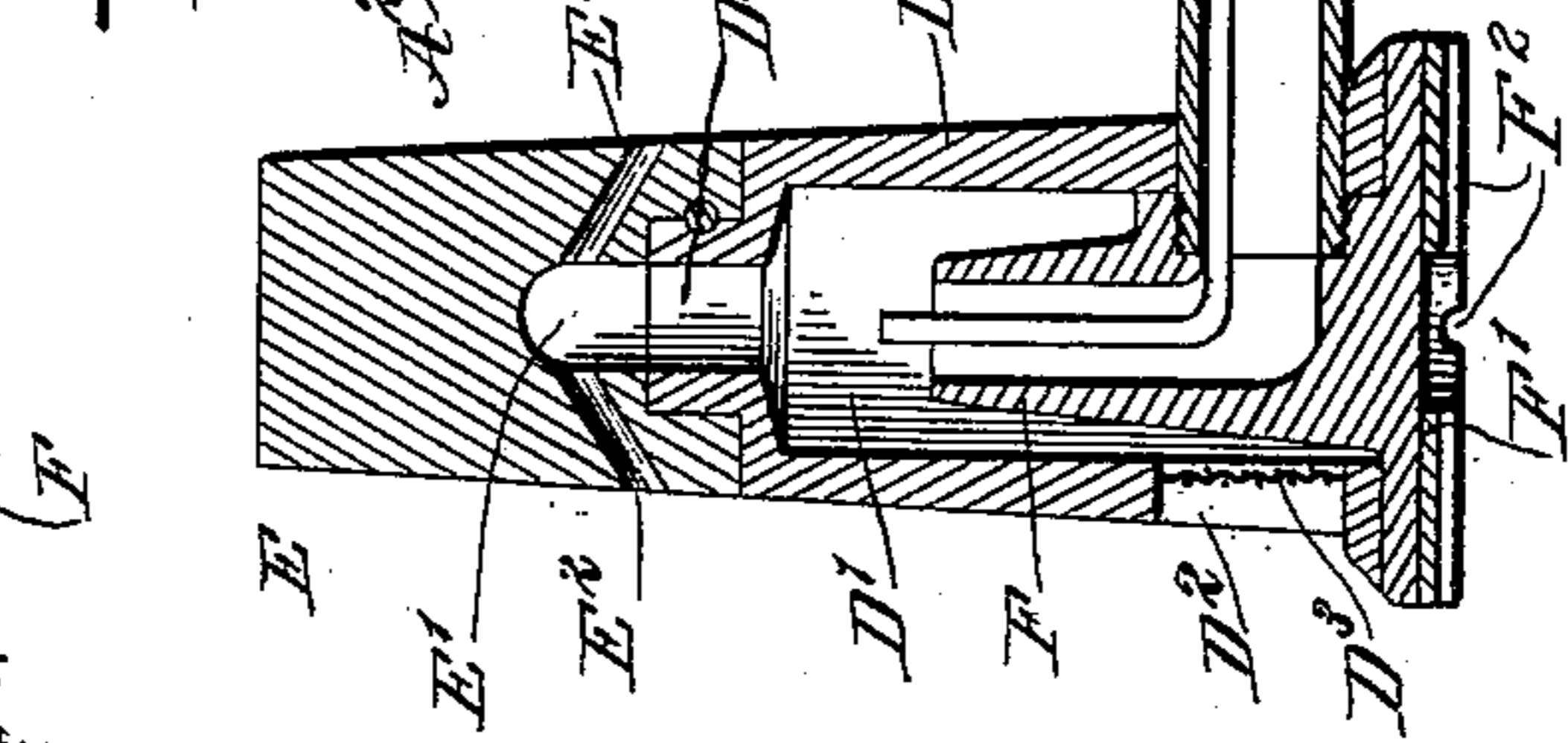
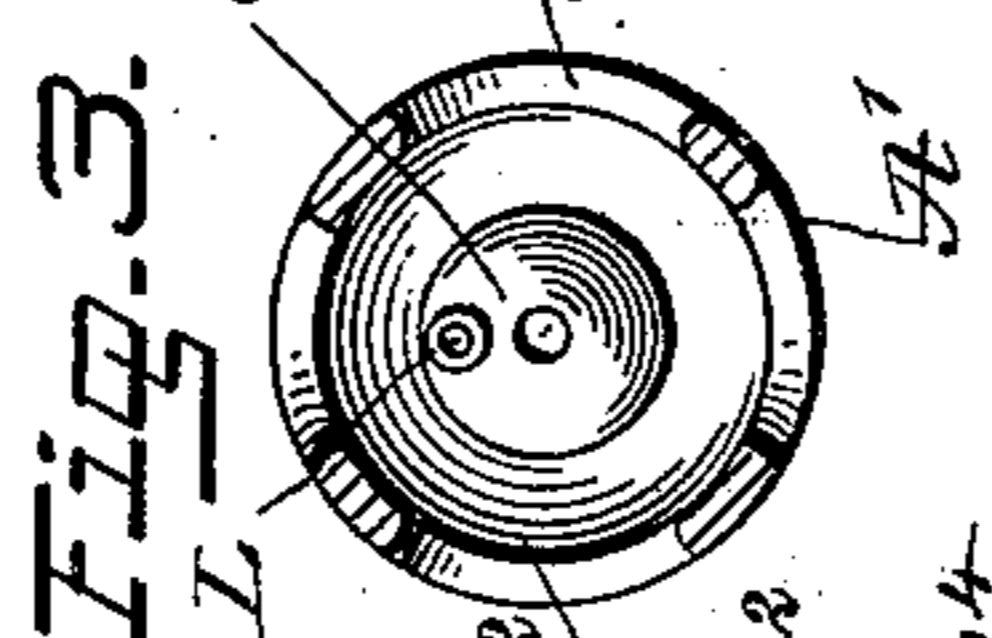
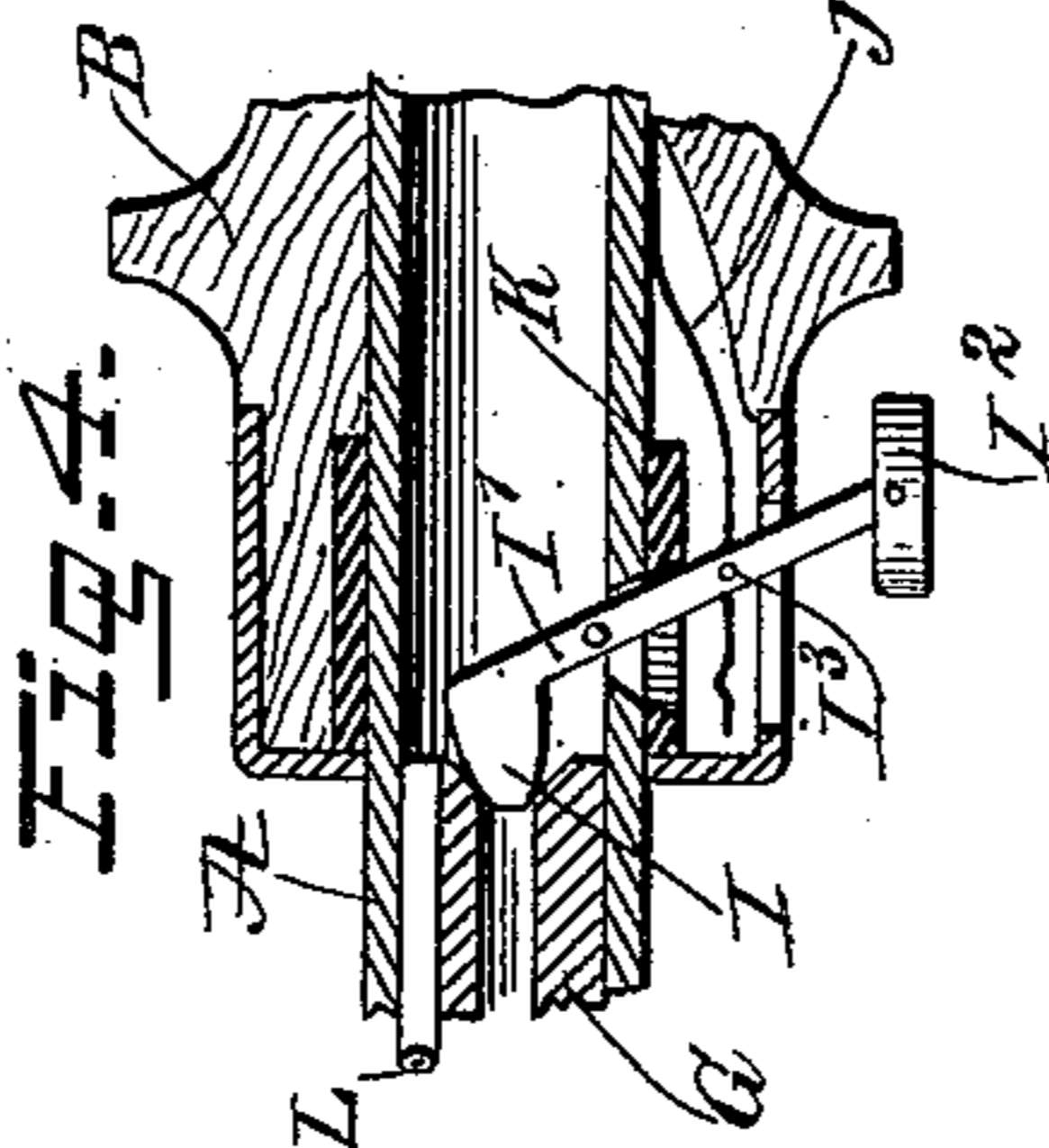
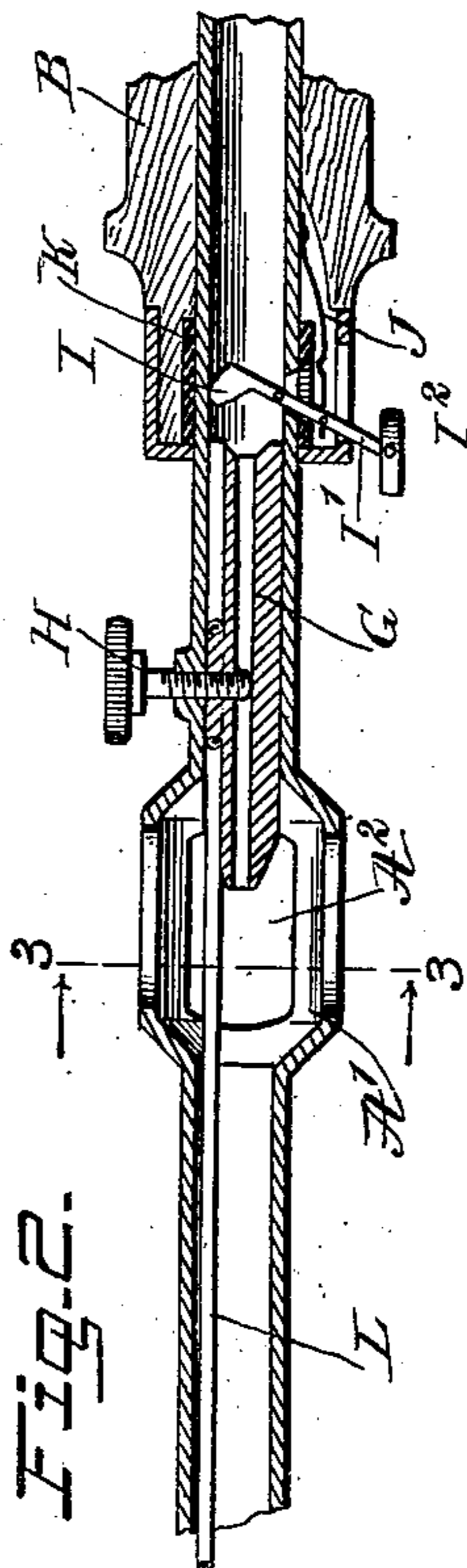
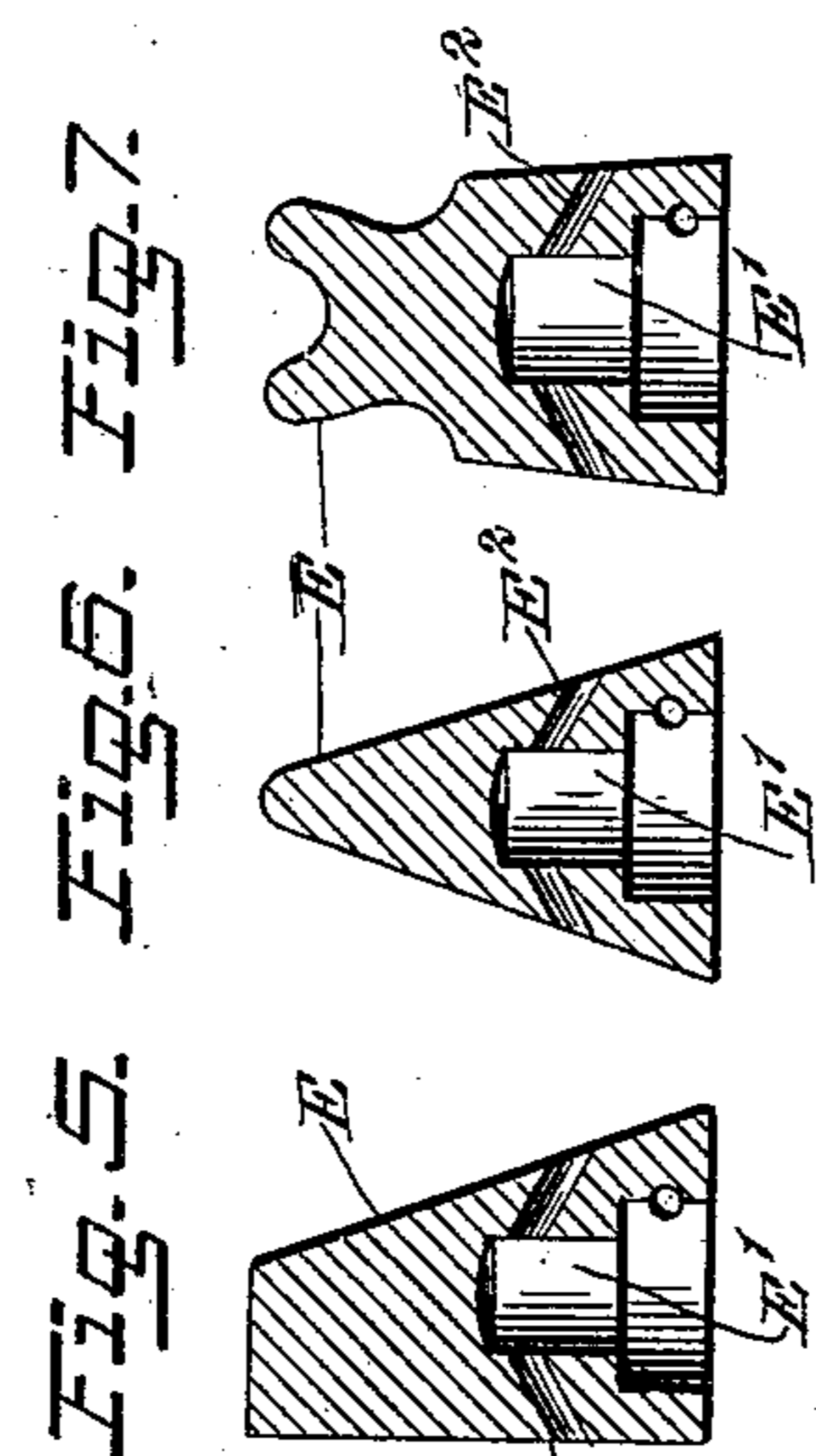


FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

WITNESSES

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# UNITED STATES PATENT OFFICE.

ADOLPH G. KAUFMAN, OF SAN FRANCISCO, CALIFORNIA.

## SOLDERING-IRON.

SPECIFICATION forming part of Letters Patent No. 712,938, dated November 4, 1902.

Application filed December 13, 1901. Serial No. 85,816. (No model.)

*To all whom it may concern:*

Be it known that I, ADOLPH G. KAUFMAN, a citizen of the United States, and a resident of San Francisco, in the county of San Francisco and State of California, have invented a new and Improved Soldering-Iron, of which the following is a full, clear, and exact description.

The invention relates to soldering-irons heated by burning gas; and its object is to provide a new and improved soldering-iron arranged to allow convenient handling and manipulating by tinner, plumbers, and other mechanics and to insure uniform internal and external heating of the point without danger of impairment by external influences, such as draft, dropping of solder, and the like.

Another object of the invention is to prevent back action of the flame.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of the improvement. Fig. 2 is an enlarged longitudinal sectional elevation of the same. Fig. 3 is an enlarged transverse section of part of the improvement on the line 3 3 of Fig. 2. Fig. 4 is an enlarged longitudinal sectional elevation of the gas-controlling inlet-valve and adjacent parts, and Figs. 5, 6, and 7 are sectional side elevations of interchangeable points for the soldering-head.

A pipe A of a suitable length is provided at one end with a handle B, adapted to be taken hold of by the operator to manipulate the soldering-iron, and on the end of the pipe A, at the handle B, is arranged a flexible tube connection C, leading to a gas-supply to conduct gas to the pipe A. On the outer end of the pipe A is removably secured by a pin or other means a head D, supporting a point E, of which there are a number used of different shapes and forms, as indicated in Figs. 5, 6, and 7—that is, each point is arranged for interchangeable connection with the head D. The latter is formed at the inside with a combus-

tion-chamber D', within which extends a burner F, connected with the outer end of the pipe A, and air-inlet openings D<sup>2</sup> lead into the said combustion-chamber D' at the base thereof, each opening being covered by a screen D<sup>3</sup>. The top of the combustion-chamber D' is provided with an outlet-opening D<sup>4</sup>, leading to a central passage E', arranged in the point E, and from this passage E' lead outlet-openings E<sup>2</sup> to the sides of the point E, as plainly indicated in Figs. 1 and 2, (see also Figs. 5, 6, and 7,) the outlet-openings E<sup>2</sup> being inclined toward the head D, so that the flame passing from the combustion-chamber D' into the passage E' and through the openings E<sup>2</sup> strikes the outside of the point E to heat the same, the flame also heating the point E from the inside during its travel through the passage E' and openings E<sup>2</sup>. By having the outlet-openings E<sup>2</sup> inclined from the central opening D<sup>4</sup> the direction of the flame is broken to cause the flame to make a better and longer contact with the walls of the passage E' and the outlets E<sup>2</sup> to insure a more intense heating of the point E, at the same time leaving the tip of the point solid. Any solder that may drop onto the point cannot flow into the openings and block up the same, so that a proper burning of the flame and heating of the point are insured at all times.

As shown in Fig. 2, the outer end of the pipe A extends through one side wall of the head D to screw into the burner F, so that the burner, head D, and pipe A are securely united with each other, and by unscrewing the pipe A the burner F may be readily removed from the combustion-chamber D' and replaced by another, if necessary. The base of the burner F is flat and fits onto the corresponding base of the head D, and on the said base of the burner is secured a covering F', of a suitable fabric of non-heat-conducting material, such as asbestos or the like. By this arrangement the soldering-iron may be conveniently seated on a table or other support, and as the covering F' is of a non-heat-conducting material it is evident that no heat is lost or wasted by contact of the soldering-iron with the support. The covering F' has air-circulating passages F<sup>2</sup> to prevent undue heating of the table or other support on which the soldering-iron may be set.

In the pipe A, adjacent to the handle B, is secured a nozzle G, having a regulating-valve H, extending to the outside of the pipe A and under the control of the operator to regulate the amount of gas passing through the nozzle G into a mixing-chamber A', arranged on the pipe A adjacent to the point of the nozzle G. This mixing-chamber A' is formed in its side wall with air-inlet openings A<sup>2</sup>, so that air can pass into the pipe A and mix with the gas issuing from the nozzle G, the mixture then passing through the forward end of the pipe A into the burner F and combustion-chamber D' to be burned therein. The rear end of the nozzle G is adapted to be closed by a valve I, preferably held on a lever I', fulcrumed on the pipe A and extending through a slot therein and through a slot in the handle B to the outside thereof, the outer end of the lever carrying a finger-piece I<sup>2</sup>, adapted to be taken hold of by the operator to impart a swinging motion to the lever I' to move the valve I to or from its seat on the nozzle G. A spring J, secured to the pipe A, is adapted to engage a pin I<sup>3</sup> on the lever I' to hold the latter in either of its two positions—that is, with the valve I either in a closed or open position relatively to the nozzle G. The spring J is preferably provided with two notches, as indicated in Figs. 2 and 4, for engagement with the pin I<sup>3</sup> to securely hold the valve in either an open or a closed position. A rubber ring K is preferably placed around the pipe A at the lever I', and this ring is formed with a slot for the passage of the lever as the latter is moved into an open or closed position. As the ring is of an elastic material, the slot readily closes to prevent escape of gas at this point. An auxiliary pipe L connects with the gas-entrance end of the pipe A and extends through the same and the burner F to the top thereof to supply the burner with a small flame for igniting the mixture of gas and air soon after the valve I is moved into an open position. The strong reduction-flame at the end of the auxiliary tube L prevents the oxidating-flame at the burner F from reaction or drawing back into the tube A and to the mixing-chamber A' and nozzle G, and hence the handle end of the soldering-iron is not liable to become heated, injured, or burned up. By the operator closing the valve I the auxiliary flame remains burning, and when the valve I is opened and the mixture of air and gas is formed and passes to the burner F this mixture is ignited by the pilot-flame to heat the head D internally and the point E internally as well as externally. By removing the point E from the head D the flame issuing from the burner F and passing through the passage D<sup>4</sup> may be utilized for free soldering or for other purposes.

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

1. In a soldering-iron, a head having a com-

bustion-chamber, and a lateral opening near the base, a burner extending into the combustion-chamber and closing the lower end of the same, and a supply-pipe extending through the lateral opening of the head and secured to the burner as and for the purpose set forth.

2. In a soldering-iron, a head having a combustion-chamber, and a lateral opening near the base, a burner projecting into the combustion-chamber and provided with a flange-like base resting against the lower end of the head and closing the combustion-chamber, and a supply-pipe projecting through the lateral opening of the head and screwing into the burner, as set forth.

3. A soldering-iron, comprising a hollow head provided with air-vents near its lower end, a removable point on the upper end of the head and having a central passage and outlet-openings, a burner having a flange-like base and fitting in the lower end of the hollow head with its base closing the same, and a valved gas and air supply pipe projecting through an opening near the base of the head and screwing into the burner, as set forth.

4. A soldering-iron, comprising a hollow head provided with air-vents near its lower end, a point secured on the upper end of the head and having a central passage communicating with the hollow head and downwardly-inclined outlets, a burner having a flange-like base and fitting in the hollow head with its base closing the end of the same, a valved gas and air supply pipe projecting through an opening in the head and secured to the burner, and a pipe extending through the supply-pipe and burner, as set forth.

5. A soldering-iron, comprising a hollow head provided with air-vents at its lower end, a point secured on the upper end of the head and having a central passage communicating with the hollow head and with downwardly-inclined openings, a burner having a flange-like base and fitting in the hollow head with its base closing the end of the same, a gas-supply pipe having its end extending through an opening in the head and secured to the burner, the supply-pipe being provided with a mixing-chamber having air-inlets, and a nozzle arranged in the pipe and discharging into the mixing-chamber, as set forth.

6. A soldering-iron, comprising a hollow head provided with air-vents, a point secured to the upper end of the head and having a central passage communicating with the hollow head and with downwardly-extending lateral openings, a burner having a flange-like base and fitting the head with its base closing the end of the same, a gas-supply pipe connecting the burner with the head and having an enlargement provided with openings and forming a mixing-chamber, a nozzle arranged in the pipe and discharging into the mixing-chamber, a valve for said nozzle and an auxiliary pipe connected with the gas and ex-

tending through the main supply-pipe into and beyond the end of the burner, as set forth.

5 7. A soldering-iron, having a head provided at one end with a point, and at its flat base with a covering of a non-heat-conducting material, as set forth.

10 8. A soldering-iron, comprising a conducting-tube having an air-inlet, a nozzle connected with a gas-supply and opening in the said tube at the air-inlet, a soldering-head on the outer end of the tube and provided with a combustion-chamber, a burner in the said chamber and connected with the said tube, 15 and an auxiliary tube connected with a gas-supply and extending through the said tube and burner, as set forth.

20 9. In a soldering-iron, the combination with a soldering-head, a burner therein, and means for supplying gas and air to the burner, of a pipe connected with a gas-supply and extending into the soldering-head to supply the burner with a small flame to ignite the mix-

ture of gas and air admitted to the burner, as set forth.

25 10. In a soldering-iron, the combination of a supply-tube provided with an enlargement having openings therein and forming a mixing-chamber, a nozzle in the tube and discharging into the mixing-chamber, and a 30 valve for said nozzle, as set forth.

11. In a soldering-iron, the combination of a supply-tube having an air-inlet opening, a nozzle-opening at the tube at the air-inlet opening, a pivoted valve for closing the end 35 of the nozzle, and a spring for holding the valve either in an open or closed position, as set forth.

In testimony whereof I have signed my name to this specification in the presence of 40 two subscribing witnesses.

ADOLPH G. KAUFMAN.

Witnesses:

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