(No Model.)

R. SCHLUMBERGER.

SOLDERING IRON.

No. 382,558. Patented May 8, 1888.

Fig. 1.

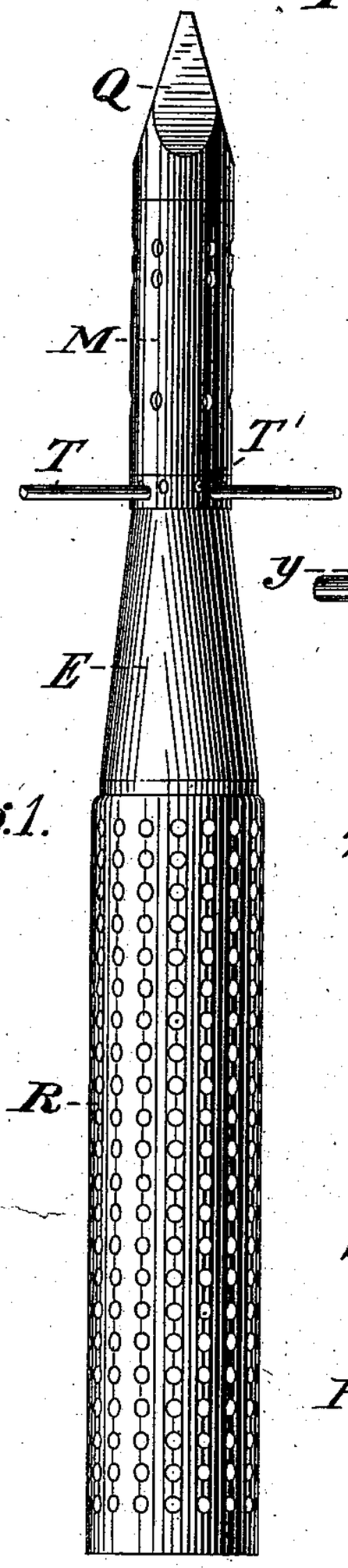


Fig. 2.

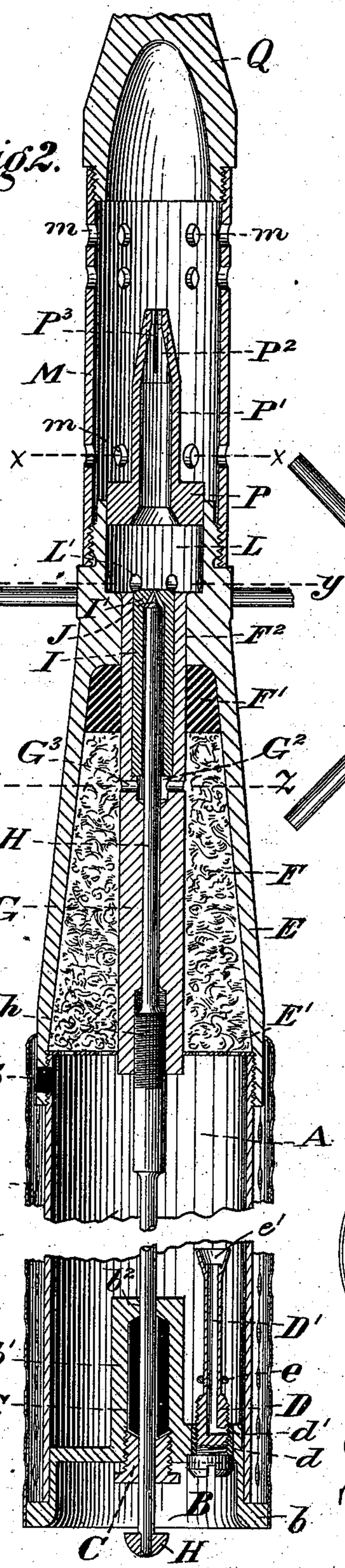


Fig. 3.

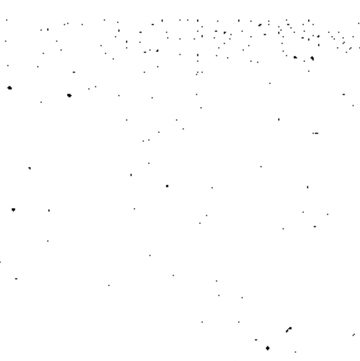


Fig. 4.

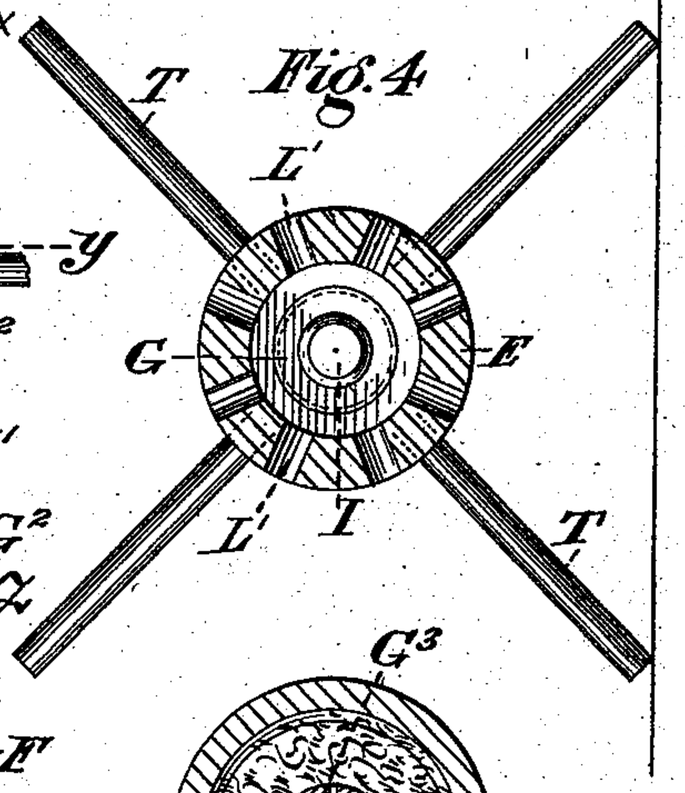


Fig. 5.

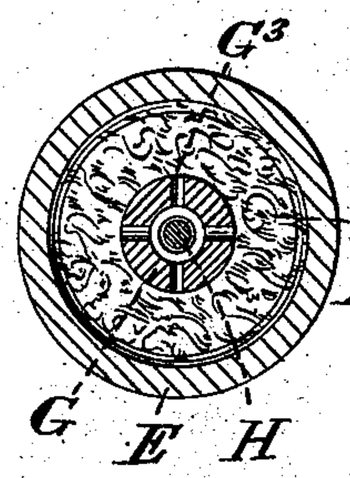
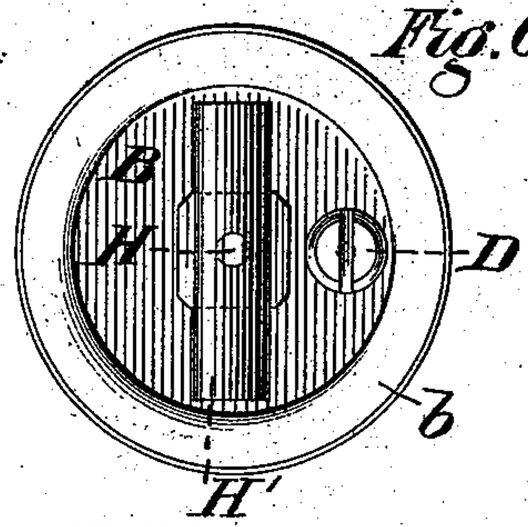


Fig. 6.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ROBERT SCHLUMBERGER, OF ALLEGHENY, PENNSYLVANIA.

SOLDERING-IRON.

SPECIFICATION forming part of Letters Patent No. 382,558, dated May 8, 1888.

Application filed September 3, 1887. Serial No. 248,671. (No model.)

To all whom it may concern:

Be it known that I, ROBERT SCHLUMBERGER, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Soldering-Irons; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is a soldering-iron; and it consists in the parts which will be hereinafter described, and pointed out in the claims.

The object of the invention is to maintain a uniform heat on the point of the soldering-iron by means of an internal fire, the gas for maintaining the fire being generated from oil held within the casing of the device.

In the accompanying drawings, Figure 1 represents an elevation of the invention, and Fig. 2 an enlarged vertical section thereof. Figs. 3, 4, and 5 indicate, respectively, cross-sections on the lines X X, Y Y, and Z Z of Fig. 2; and Fig. 6 represents a bottom view of the device.

Like letters indicate like parts in the several views.

The letter A represents a cylindrical casing or reservoir for the reception of oil. The lower end of this reservoir is closed by a cup-shaped cap, B. The outer edge of this cap is provided with a circumferential flange, *b*, and it is also provided with a central opening. Around the edge of said opening, and projecting inward therefrom, is a chambered extension, *b'*. The inner end of said extension is provided with a central opening, b^2, for the reception of the valve-stem. The outer end of this extension is internally screw-threaded for the reception of an externally-screw-threaded plug, C.

C' indicates a lead packing in the chamber of the extension *b'*, and said packing is held in position by the plug C. Said plug is provided with a central opening for the reception of the valve-stem.

The floor of the cup B is provided with an opening for the reception of the screw-plug D. Said opening is provided with an internally-screw-threaded lead ring, *d*, which engages the screw-plug D. The inner end of said plug is provided with a tubular extension, D', having a funnel-shaped inner mouth. A side opening, *d'*, in the plug D communicates with the tubular extension D'. The opening in the floor of the cap which receives the screw-plug D is to admit oil to the reservoir. Air escapes through the tube D' and side opening, *d'*, when the screw D is withdrawn and oil poured in. When the reservoir is being filled with oil, the device is inverted from the position shown in the drawings, so that the cup B shall be on top, whereby said cup may be filled with oil and the oil passed through the opening into the reservoir without the use of a funnel or other device. A stop, *e*, is secured within the reservoir, to prevent the tube D' from being wholly withdrawn from the opening in the cup when the reservoir is being filled. The inner end of said tube is provided with a funnel-shaped mouth, *e'*, which prevents it from being drawn out beyond the stop *e*. Said stop encircles the tube D'.

The letter E represents a hollow tapering casing. The lower or larger end of said casing is internally screw-threaded for a short distance, and the upper end of the casing A is externally screw-threaded. The screw-threads aforesaid on the casing A engage those in the casing E. The upper end of the casing A is closed by a perforated disk, E'. The chamber of the casing E is provided with an absorbent material, F, and a shellac ring, F'.

G represents a tube, the main body of which lies within the chamber of the casing E. The absorbent F and shellac ring F' encircle and inclose the tube. The lower end of said tube extends through the perforated disk E' into the reservoir A, and the upper end thereof extends upward through an opening, F^2, in the upper end of the casing E. The chamber within the tube G is of different diameters, the ends being larger and the central smaller. The opening in the lower end of said tube is internally screw-threaded for the reception of the enlarged part of the valve-stem *h*, which is externally screw-threaded. Within the tube G, immediately below the seat for the short tube I, is a small chamber, G^2. The tube G is provided with a series of side openings, G^3, which communicate with the chamber G^2, and

said openings also communicate with the chamber containing the absorbent material F.

H represents the valve-stem, having an actuating bar or handle on the outer end thereof. This valve-stem extends through the cup B, plug C, packing C′, thence through the oil-reservoir and into the tube G. The valve is regulated by turning the handle and stem H. The valve is forced in and out by the rotary motion of its stem and the action of the screw-threaded parts *h* and the screw-threads in the tube G.

I represents a tube seated within the upper end of the tube G. The opening within the tube I is contracted at its upper end, so as to form a needle-valve seat, I′, for the valve or pointed end J of the rod. The upper end of the rod H and its needle-valve lie within the tube I. The opening within the tube I is sufficiently large to leave an annular space between the outside of rod H and the inner walls of said opening, so that gas may pass through said space, thence through the valve and into the burner. Should any particle of oil find its way into the said annular space, the heat from the tube I would quickly transform said oil into a gas. Above the opening in the casing E is a chamber, L. Said chamber is provided with a series of openings, L′, for the admission of air to the chamber. The contracted opening in the upper end of the tube I communicates with the chamber L when the valve is open. The walls of the chamber L are externally screw-threaded for the reception of a hollow neck, M. Said neck is internally screw-threaded at its lower end, so as to engage the external screw-threads on the outer casing or walls of the chamber L. The burner is hollow, and it consists of an enlarged base, P, tubular neck P′, and contracted upper end, P². Said contracted upper end is provided with a series of vertical slits, P³. The base of the burner P fits snugly within the upper end of the chamber L. The point Q is hollowed out on its under side, and the outer lower end of said point is recessed and provided with screw-threads. The upper end of the neck M is internally screw-threaded for the reception of the screw-threaded portion of the point. The neck M is provided with a series of openings, *m*, which communicate with the combustion-chamber within said neck.

The reservoir A is inclosed with a perforated cylindrical casing, R. An annular space intervenes between the inner face of the perforated casing R and the outer face of the reservoir A. The lower end of the casing R is rigidly united by any suitable means to the outer edge of the flange *b*, and the upper end of said casing R may be firmly united to the outside of the casing E, or turned in so as to lie in close contact therewith.

The connected ends of the casings A E are provided with an opening which communicates with the interior of the oil-reservoir. Said opening is closed by a fusible plug, S.

T represents four radial arms of equal length, having their inner ends secured in openings T′ in the upper side of the casing E. The arms are to support the device and prevent it from rolling or turning when laid down, and at the same time elevate the point Q and prevent the same from contact with material likely to be injured by the heat thereof.

The operation of the invention is as follows: Oil is supplied to the reservoir A through the opening in the bottom of the cup B when the device is inverted, as hereinbefore stated. The oil in the reservoir A passes through the perforations in the disk E′ and saturates the absorbent material F within the chamber of the casing E. The point Q is heated by gas generated from the oil carried within the chambers. In order to generate a gas in the first instance the point and neck M are placed in or over a fire and heated while the point and neck are in the fire. The heat from the neck M and heat which enters the openings *m* in said neck will heat the burner and also heat the tube G. The heat of the tube G will heat the oil in the absorbent material F. The heated oil will exert an expansive force and generate a gas. The gas thus generated or heated oil, or both, will pass through the side openings, G³, into the tube G, and thence into the chamber G²; thence through the tube I, around the valve-stem, and then around the valve through the opening in the upper end of the tube I, thence into the chamber L, where the gas and air commingle. The combined gas and air then pass up to the burner, where they are consumed. The heat generated by the consumption of the gas passes up into the cavity within the point Q, whereby said point is heated. Having once generated gas and ignited the same, the supply thereof and flame and heat therefrom may be maintained for any desired length of time. In addition to heating the pipe G from the heat within the chamber of the neck M, the casing E is also heated. The heat of said casing serves to heat the oil within its casing, also heats the pipe G, and thereby aids in the boiling of the oil and the generation of the gas. Should the upper end of the casing E expand by the heat, so as to withdraw from contact with the tube G, the shellac F′ will melt and run into the space thus formed, and thereby serve as a packing and prevent the oil or gas from passing around the outside of the tube G into the chamber L.

The perforated casing R is of greater diameter than the reservoir-casing A, so that an annular space is formed between the casings. By this arrangement the casing R is held away from the heated parts and kept sufficiently cool to enable the operator to handle the device.

Should the casings A E become overheated, the plug S will fuse and permit the escape of oil and gas, and thereby prevent and relieve excessive pressure within the casing.

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

1. In a soldering-iron, the combination of a reservoir, said reservoir being provided with an opening to admit oil and a plug for closing said opening, the inner end of the plug and the side thereof being provided with openings which communicate, the inner end of said plug being also provided with a tubular extension whose opening is in communication with the openings aforesaid, substantially as specified.

2. In a soldering-iron, the combination of a reservoir, said reservoir being provided with an opening to admit oil and a plug for closing said opening, the inner end of the plug and the side thereof being provided with openings which communicate, the inner end of said plug being also provided with a tubular extension whose opening is in communication with the openings aforesaid, and a stop to limit the outward movement of said plug and extension, substantially as specified.

3. In a soldering-iron, the combination of a reservoir and a casing secured around said reservoir, leaving an annular space between the outer side of the reservoir and the inner side of the casing, substantially as specified.

4. In a soldering-iron, the combination of a reservoir and a perforated casing secured around said reservoir, leaving an annular space between, substantially as specified.

5. In a soldering-iron having a burner, the combination of a reservoir, a casing having a chamber provided in one end with an absorbent material and having a fusible material in its other end, the end in which the fusible material is located being provided with an opening, and a tube engaged in said opening, said tube extending through the chamber aforesaid, substantially as specified.

6. In a soldering-iron having a burner, the combination of a reservoir having a casing secured thereto and separated therefrom by a perforated partition, a tube extending into said casing, the side of said tube being provided with openings in communication with the chamber in the casing aforesaid, a valve-seat located in one end of the said tube, and a valve-stem and valve, the said stem being within the tube and reservoir aforesaid, the outer end of the stem being outside the reservoir, substantially as specified.

7. In a soldering-iron having a burner, the combination of a reservoir having a casing secured thereto and separated therefrom by a perforated partition, a tube extending into said casing, the side of said tube being provided with openings in communication with the chamber in the casing aforesaid, a valve-seat located in one end of the said tube, and a valve-stem and valve, the said stem being within the tube and reservoir aforesaid, the outer end of the stem being outside the reservoir, said outer end being provided with a handle, substantially as specified.

8. In a soldering-iron having a burner, the combination of a reservoir having a casing secured thereto and separated therefrom by a perforated partition, a tube extending into said casing, the sides of said tube being provided with openings in communication with the chamber in the casing aforesaid, a short tube having a valve-seat in its outer end, the short tube being seated in one end of the tube aforesaid, and a valve-stem and valve, the said stem being within the tubes and reservoir aforesaid, the outer end of the stem being outside the reservoir, substantially as specified.

9. In a soldering-iron having a burner, the combination of a reservoir having a casing secured thereto and separated therefrom by a perforated partition, a tube extending into said casing, the sides of said tube being provided with openings in communication with the chamber in the casing aforesaid, a short tube having a valve-seat in its outer end, the short tube being seated in one end of the tube aforesaid, and a valve-stem and valve, the said stem being within the tubes and reservoir aforesaid, the outer end of the stem being outside the reservoir, the body of the stem having an enlarged screw-threaded portion in engagement with a screw-threaded opening in one end of the main tube aforesaid, substantially as specified.

10. In a soldering-iron having a burner, the combination of a reservoir having a casing secured thereto, a hollow perforated neck secured to said casing, and a soldering-point secured to the outer end of said neck, said casing being provided on its inner side with a tube having side openings and with a valve-seat, a hollow burner located in the neck aforesaid, and a chamber located between said burner and tube, the walls of said chamber being provided with openings for the admission of air, and a valve and stem, the stem being located within the reservoir and tube aforesaid, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT SCHLUMBERGER.

Witnesses:

FRANK A. FOUTS,

JOHN HERMANN.