

No. 613,586.

Patented Nov. 1, 1898.

W. MITCHELL.
SOLDERING IRON.

(Application filed Jan. 17, 1898.)

(No Model.)

Fig. 1.

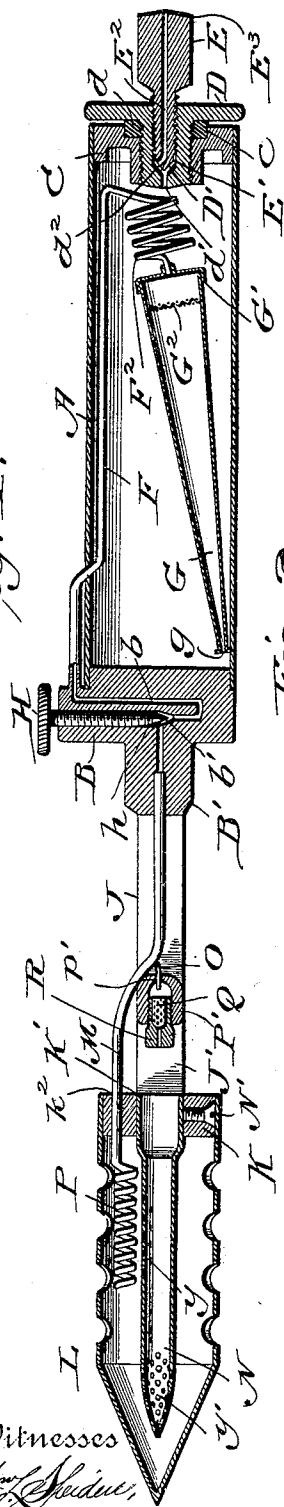


Fig. 2.

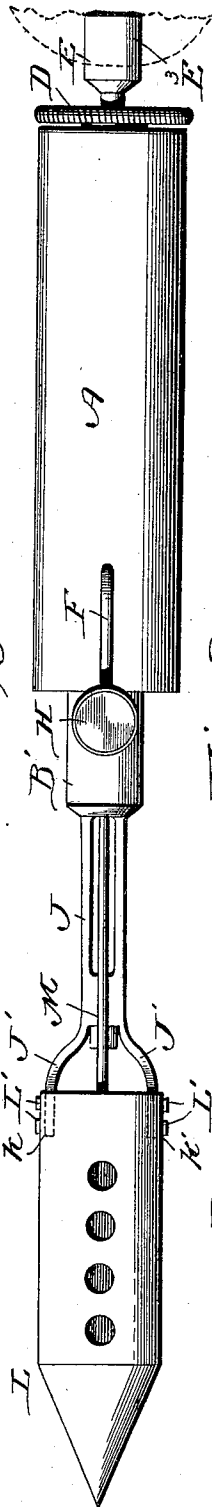


Fig. 3.

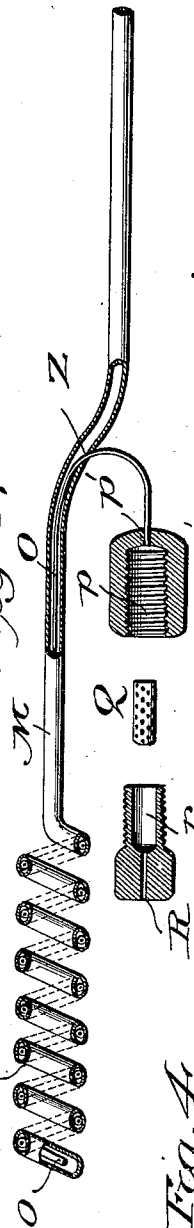


Fig. 4.

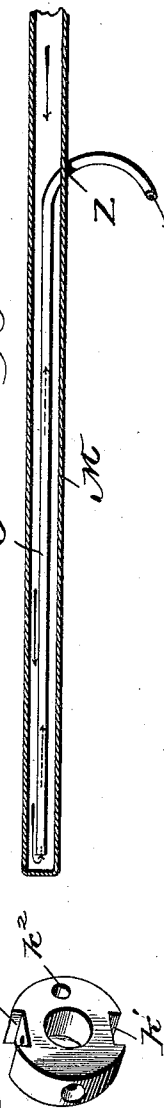


Fig. 5.



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SOLDERING-IRON.

SPECIFICATION forming part of Letters Patent No. 613,586, dated November 1, 1898.

Application filed January 17, 1898. Serial No. 666,882. (No model.)

To all whom it may concern:

Be it known that I, WILLIS MITCHELL, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, 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.

This invention relates chiefly to soldering-irons and similar tools which are heated by gasoline or a similar volatile fluid supplied by a reservoir in the handle.

An important feature of the said invention consists in the combination of an inner reservoir or receptacle with the reservoir formed in the handle and means of support which allow the said inner reservoir to dip to the bottom of the outer reservoir, and thus take up a supply of fuel so long as any remains in the latter, whatever the position of the implement may be, excepting only when the head or point of the implement is tilted upward, in which case the gasoline within the inner reservoir is relied upon to supply the generator, nozzle, and burner. When this supply is exhausted, the head of the implement is lowered and the inner reservoir filled again.

The invention consists also in certain improved devices for supplying air and gasoline to the said outer reservoir; in the especial means for allowing and controlling the passage of the gasoline from the inner reservoir to the point of the iron; in the combination of an outer and an inner pipe wound together and forming a double spiral passage for a reversed current of gasoline, the same being a generator of inflammable vapor and located in proximity to the burner which it supplies; in the means hereinafter described for attaching the point or head and burner to the shank of the iron and permitting the passage of the gasoline-tube into the said head or point; in the construction and combination of the jet-block, removable jet-nozzle, and removable screen, and in certain additional features hereinafter more particularly set forth and claimed.

In the accompanying drawings, Figure 1 represents a central vertical longitudinal sec-

tion of a soldering-iron embodying my invention. Fig. 2 represents a plan view of the same. Fig. 3 represents a detail view, partly in side elevation and partly in vertical section, of the generator, the pipes connected therewith, the jet-block, screen, and jet-nozzle, the three latter parts being detached. Fig. 4 represents a detail perspective view of the recessed disk or base of the point, adapted to be attached to the bifurcated shank; and Fig. 5 represents a longitudinal section of the two concentric pipes before they are wound in the form of screw to constitute the generator.

A designates the handle of a soldering-iron, consisting of a cylindrical shell which is closed at the front end by a solid block B, soldered to said shell, and at the rear end by a centrally-screw-tapped head C, having in its outer face a circular groove *c*, that receives a rubber gasket *d*, interposed between the said head and the head of a screw-plug D, which turns into the said head and out of it at will. The said plug is also provided with an inwardly-extending screw-threaded recess *D'*, which communicates through a small aperture *d'* with the interior of the handle A and has a conoidal inner end or seat *d''*. An air-valve E is provided with screw-threads permitting it to turn into and out of the said recess and with a conical tip *E'*, which fits against the seat *d''*. A passage *E''* extends centrally through this valve from its outer end, but bends aside before reaching the point of the said tip, so that it will be closed by bringing the said tip into contact with the said seat. The outer end of the said valve is formed into a knob *E''*, so that a rubber bulb (indicated by dotted lines) may be fitted upon it.

The interior of the handle A constitutes a reservoir or receptacle for gasoline introduced through the head C after the plug D has been removed.

When the iron is in use, the air-valve E is screwed out, so as to uncover the inner end of its passage *E''* by separating the tip *E'* from the seat *d''*. The rubber bulb is then compressed, forcing air into the said reservoir and thereby driving the gasoline out of it through a pipe F. The screw-plug is at once turned home again to prevent the air from escaping. This pipe does not communicate directly with the said reservoir, but is formed within the

same into a coil or spiral F^2 , from which the upper end of an inclined and tapering inner receptacle or reservoir G is freely suspended in order that its open tip g may rest on the bottom of the said outer reservoir in whatever position the said iron may be used, except when it is held point upward. This reservoir G is provided with a cap G' , through which the end of the said coil enters. It has also a strainer G^2 , arranged across it a little below the cap. The gasoline-pipe F passes through the top of the shell of handle A a little distance short of its forward end, so as to be out of the way of the tip of inner receptacle G when the iron is turned over. The resilient flexible tubular supporting coil or spiral F^2 allows the inner receptacle to swing from side to side in order that the tip g may lie at the lowest point of the periphery of the said handle or outer reservoir no matter into what position the said handle may be turned on its axis.

The inner receptacle G holds enough gasoline-oil to last for about half an hour. This will generally answer the workman's present requirements, even when the point is held upward, so that the tip of the inner reservoir G will be clear of the oil, the oil being held in the said inner reservoir by its own gravity. When it becomes necessary to recharge in such circumstances, the iron is tilted so as to bring the tip of the said inner reservoir under the surface of the oil again, in which position the pressure of the air on the liquid gasoline, as before described, will force it into the said inner reservoir.

The pipe F is carried along the shell or handle A and into block B at the forward end thereof, making connection with a bent passage b therein, which is arranged to be opened or closed partly or wholly at one point by a regulating-valve H, consisting of a screw that works in a correspondingly-threaded recess of the said block and has a conoidal end h , fitting a correspondingly-shaped seat b' , partly in the path of the said passage. J designates the shank of the iron, which consists of two parallel parts or sections fastened at their rear ends on a forward extension B' of the said block B and having at the forward end two diverging prongs J' , which fit into recesses k/k' in opposite parts of the periphery of a disk K, which forms a base or attaching plate for a point L, which is fastened thereto by screws L' . A gasoline-pipe M extends from the rear end of block B, where it makes connection with passage b and through the said shank longitudinally to a hole k^2 in the said disk or base K, whereby it enters the point or head L. An elongated tubular burner N, having a conical tip, is fitted at its base into a central hole K' of disk K and fastened by screw N' . The prongs J' are additionally fastened to the disk K by screws L' .

O designates a pipe of less diameter, which is arranged within the forward part of pipe M, its forward end being open and not ex-

tending as far as the forward end of the latter pipe, which is closed, as shown in Fig. 5. The two pipes thus arranged are slightly flattened and wound into a generator P of worm form, which has a double spiral passage within it. The oil first winds through the outer pipe M to its closed end, then returning through inner pipe O in a corresponding path. During its entire journey both ways the gasoline is exposed to the heat of the burner, which is parallel to the said generator, at a very slight interval. In consequence the gasoline is rapidly and effectively vaporized and is then delivered under pressure by pipe O through a small passage or opening p' of jet-block P' to the rear end of a screw-threaded interior recess p of said block, this recess being open at its forward end to receive the screw-threaded shank of a tubular jet-nozzle R. The rear end of this nozzle is provided with a recess r , which receives a cylindrical strainer Q, the office of which is to filter the gasoline vapor before it issues from the nozzle and is discharged in a state of ignition into the open end of the burner. The nozzle and the strainer are easily removed together, after which they may be separated for cleansing.

In using the iron hereinbefore described I first remove the screw-plug from the handle, taking the air-valve with it, and then fill the interior of the handle with gasoline. Then I replace the screw-plug and turn home the valve H to cut off the outlet from the reservoir in the handle. Then I place a rubber bulb on the air-valve E in the screw-plug and turn the said valve so as to open the passage into the reservoir. I then squeeze the bulb to force air in through the air-inlet thus made. I then turn home the air-valve again to keep the air from escaping. Then the valve H is opened a little, and the air pressure forces the gasoline into and through the inner reservoir G and through the various tubes and passages before described to the generator and the jet-nozzle.

In making the generator the inner tube O is securely soldered in place about one-fourth of an inch short of the closed end of tube M. It is also made gas-tight where it extends at Z through the side of the latter tube to reach the jet-block P' .

The burner is longer than the generator and provided with holes y opposite the burner and with other holes y' at its tip. The generator and burner together have an automatic regulating action on the heat and pressure; but as this is not essentially different from what has hitherto been known and practiced in the art I do not consider any explanation necessary.

The conical shape of the inner reservoir increases the capacity thereof while leaving the tip of a small diameter. It also removes the center of gravity toward the upper end, making the said tip light of motion and easily responsive as the implement turns.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the point of a soldering-iron and a burner arranged to heat the same, a reservoir for the liquid vaporizable fuel required by the said burner, an inner reservoir hung freely in such manner that it will reach the bottom of the outer reservoir in various positions of the said iron and provided in its lower part with a supply-opening and means of communication from the said inner reservoir to the said burner substantially as set forth.

2. An implement for applying heat provided with a head or heat-applying part, a burner heating the said head, and an inner and outer reservoir, supplying the said burner with gasolene or similar easily-vaporizable fuel, the inner reservoir receiving the liquid from the outer one and being suspended to reach the bottom of the latter, whichever side of the implement is uppermost substantially as set forth.

3. The hollow handle A, constituting a gasolene-reservoir, in combination with the head or heat-applying part of the implement, a burner heating the said head, an inner reservoir G open at its lower end, and a gasolene-pipe wound into a coil for suspending the upper end of the said inner reservoir loosely within the said handle, the said pipe also serving to conduct the gasolene from the said inner reservoir toward the burner substantially as set forth.

4. A reservoir consisting of a hollow implement-handle provided at one end with an air-inlet and means of opening and closing the same at will, in combination with the head or heat-applying part of the implement, means of heating the said head, an inner receptacle which is provided with an opening in its lower end and an outlet-pipe which makes communication between the said inner receptacle or reservoir and the said means of heating the said head and is wound into a coil for flexibly suspending the upper part of the said inner receptacle in order that the latter may automatically adjust its position to draw from the lower part of the contents of the outer reservoir whatever the position thereof substantially as set forth.

5. In combination with an outer receptacle adapted to receive an inflow of air, an inner receptacle adapted to be supplied at its lower end by the contents of the said outer receptacle, an outlet-pipe, a screen or strainer arranged across the said inner receptacle between its inlet and its outlet the head or heat-applying part of the implement, means for heating the said head supplied by the said outlet-pipe substantially as set forth.

6. A handle for an implement adapted to apply heat having in one end a head or heat-

applying part which is screw-threaded internally, a screw-plug which is screw-threaded both internally and externally and provided at the inner end of its internal thread with a conoidal seat, an air-valve comprising a screw-threaded stem and a conical tip and having a longitudinal passage which is bent laterally at its inner end so that it will issue at the side of the cone, the said handle being also provided with an outlet and tubular connections conveying the gasolene to the burner substantially as set forth.

7. An implement-handle consisting of a hollow shell adapted to contain gasolene and provided at one end with a solid block traversed by a channel or passage and at the other with a head containing adjustable means of admitting air, in combination with a pipe conducting the gasolene to the passage in the block, a burner and communications conducting thereto the gasolene from the said passage, the head or heat-applying part of the implement, a burner heating the said head and supplied with ignited gasolene through the said jet-block and a valve which has a screw-threaded stem working in a screw-tapped recess in the said block to open or close at will the said passage partly or wholly substantially as set forth.

8. In combination with the head or heat-applying part of an implement, a burner therefor and a jet-nozzle discharging into the same, a generator supplying the said nozzle with inflammable vapor and consisting of two pipes one within the other wound into the form of a worm the inner pipe being shorter than the outer one and having an open forward end whereas the corresponding end of the outer pipe is closed, the said generator being in proximity to the burner and supplied with easily-vaporizable liquid which is compelled to twice follow a spiral path while exposed to the action of the heat of the said burner substantially as set forth.

9. In combination with the hollow point of a soldering-iron and a disk or base to which it is fastened having a central opening and peripheral recesses, a burner fastened in the said opening so as to be located within the said point, a gasolene-pipe extending through an opening in the said disk, the shank of the implement having prongs which are fastened in the other recesses, a jet-nozzle in the said shank arranged to discharge flame into the said burner and supplied by the said gasolene-pipe and means for supplying gasolene to the said pipe substantially as set forth.

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

WILLIS MITCHELL.

Witnesses:

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G. E. GEORGE.