March 18, 1924.

1,486,924

J. A. RUPPEL

SOLDERING IRON

Filed April 9, 1923

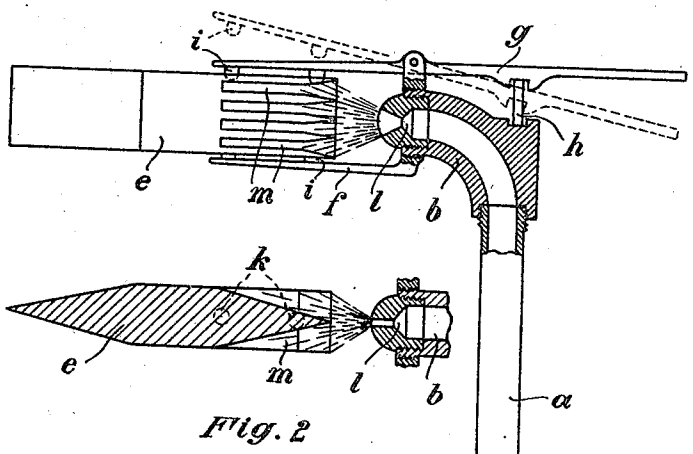


Fig. 2

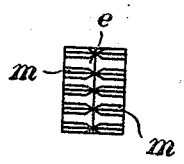


Fig. 3

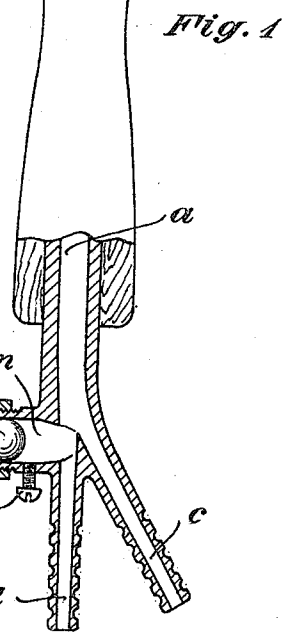


Fig. 1

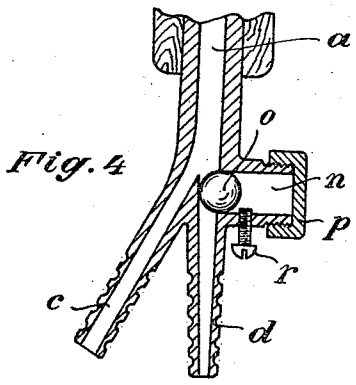


Fig. 4

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Patented Mar. 18, 1924. 1,486,924

UNITED STATES PATENT OFFICE.

JOSEPH ALOIS RUPPEL, OF SELIGENSTADT, GERMANY.

SOLDERING IRON.

Application filed April 9, 1923. Serial No. 630,995.

To all whom it may concern:

Be it known that I, JOSEPH ALOIS RUPPEL, a subject of the German Empire, and resident of Seligenstadt, Hessia, Germany, have invented certain new and useful Improvements in Soldering Irons, of which the following, taken in connection with the accompanying drawing, is a specification.

The invention relates to a soldering-iron provided with burner and heating means and has for its object a more efficient use of the flame jet, as well as to effect a considerable saving of heating gas.

In contradistinction to the known soldering-irons with a hollow bit and grooves arranged inside, by the object of the invention heating means are arranged outside, representing channels running sloping to the longitudinal axis of the bit. By a bit of a rectangular cross section the heating channels, commencing at the bottom end, offer the greatest surface to the origin of heat, i. e. the burner, and are in direct connection with same full length. The heating channels so formed facing the burner in this manner offer the largest cross sectional opening. The latter, in consequence of its slope sections towards the end, a slight pressing of the flame jets takes place, without however impeding their smooth passage, free from obstruction. This special arrangement and form of the heating means of the invention is intended and adapted to bring about a very effective, intense, even and rapid heating of the copper bit. This effect is further heightened by a particular complete use of the flame jet if a slit burner, so arranged and at such distance from the edge of the rectangular wedge-like bit, as to run parallel and in the same direction, thus, by separating, the flame jet acts on all channels to fullest extent. In addition the soldering-iron may be provided with a special device of throttling the flame jet which, on putting down or taking up the tool for use, acts automatically. This offers the advantage of the tool being kept heated during short interruptions of work with a but very slight consumption of gas, and very rapidly heating it up again to the temperature required for working after taking up the implement.

The throttling takes place by either totally, or partially shutting off the way of one of the gas pipes in the soldering-iron, or of the pipe supplying the compressed air, by an injector-like suction arrangement, or of the mixed gas. For cutting off the flow of gas a valve is provided which in consequence of its dead weight blocks the openings or passages of the respective pipes or channels, as soon as the soldering-iron is put down in a certain, for instance reclining position, whilst it takes up its original position thus giving free the passage, immediately the implement is brought back into working position. Work, requiring the soldering-iron to be applied in a position, in which the valve would bar the respective passage, a diposition enables the fixing of the valve, rendering it ineffective thereby. This device is conducive not only to a considerable saving of heating gas, material (copper) and work, but also prevents overheating and destruction of the copper bit, when laid down temporarily.

The object of the invention is illustrated by the accompanying drawing.

In the example the compressed air, injector-like bringing on the heating gas by suction, is barred and the valve for this reason arranged in the compressed air pipe, i. e. its outlet.

Fig. 1 shows the soldering-iron complete with the bit frame, burner and handle, adapted for compressed air-mixed gas heating, partly in section and partly in view.

Fig. 2 represents a cross section of the soldering bit and burner,

Fig. 3 is a front view of the heating frame ends of the bit and

Fig. 4 is a section through the throttling device with the valve barring the passage.

In the drawing *a* represents the mixing pipe, serving as a handle with burner joint *b* and the two inlet tubes *c* and *d* for admitting gas and compressed air.

On the burner joint *b* a frame for exchangeably fixing the bit is adjusted. The bit frame represents a pair of tongs, with a stationary side-piece *f* and a movable piece *g* which latter acts as a double lever and is held in a fixed position by the wedge *h* or the like of the burner joint and rear part of the movable piece. The shanks *f* and *g* on the inner side are provided with raised parts, corresponding with cavities on the narrow sides of the bit *e*. When closed these wart-like raised parts *i* grip into the cavities *k* of the bit, thus holding it tight. This fixing of the bit detachably may also be attained by other means.

Of importance is the particular arrangement and form of the heating means, immediately connected or forming one piece with the material of the bit. The bit *e* combines by a rectangular cross section the form of a double wedge. The length parts facing the burner *l* are provided with channels *m* running at an angle to its longitudinal axis. The free ends of the walls of the channel opposite the burner *l* are preferably sharpened in order to diffuse the flame jet well and evenly, without presenting any obstruction.

The frame of the bit may moreover be provided with a sleeve, holding the flame jet together and preventing too strong a spreading from the bit.

The channels admitting the flame jets on the side opposite the burner *l* possess the greatest cross section and are narrowed towards the end owing to the transversely cut grooves, and act to permit the flame jets to pass freely therethrough with maximum heating effect.

A parallel split burner is advantageously used running in the same direction as the sharp edge of the bit and arranged at such a distance from same that, divided thereby, the flame jet acts on the surface to full extent. In so doing the flame jets are subdivided by the sharpened ends of the walls of the channels *m* provided on both sides, into single flame-pillars,

In consequence of the jet from the split burner being subdivided thereby several times with the nucleus of the flame directed on the sharp edge of the bit, an exceedingly favourable and complete use of same is made. If the burner be intended for gas or mixed gas a self-acting throttling device is advantageously provided.

At the junction of the inlet for compressed air *d* and gas inlet *c* of the annexed drawing, a case *n* for carrying the throttle valve, formed by a ball, which bars the opening of the compressed air pipe if the tool be placed into a certain, for instance reclining position, is shown.

The case *n* is provided with a cap *p* and an adjusting-screw *r* passing through the side of the case.

By means of the latter the valve may be kept open and in particular cases be prevented from falling into the throttling position.

The cap *p* enables the insertion into the case *n* of valve *o* and its convenient removal. The whole disposition is such, that, merely owing to its dead weight, the valve must always fall into the throttling position, as soon as the soldering tool is brought into a certain position, reclining, for instance. If brought into position for working, however, the valve, owing to its dead weight, likewise goes back again, thus giving free the pipe for the compressed air to pass through. Work, to be executed with the soldering-iron in its reclining position requires the adjustment of the screw *r* in such manner as to prevent the valve from falling into the throttling position.

Any other suitable valve may also be employed in place of the ball valve.

Of importance is however its installation in one of the three pipes (the compressed air inlet, the gas inlet or the mixing tube) or in the distributor, in such manner, that in consequence of its dead weight it automatically throttles or entirely closes up one of respective passages, as soon as put down and giving it free again on being taken up in a working position.

I do not desire to limit myself to the precise details of construction and arrangement above described, as it is obvious that various modifications may be made therein without departing from the essential features of my invention, as defined in the appended claims.

I claim:—

1. In a soldering iron, a bit having a pointed end and channels on opposite sides of said end and running at an angle to the longitudinal axis of the bit and holding means including tongs bearing directly on the sides of said pointed end at the outer sides of said channels, in combination with a burner arranged opposite and presented to said pointed end of the bit to direct its flame directly on said pointed end and through said channels.

2. In a soldering iron, a bit having a pointed end and channels on opposite sides of said end and running at an angle to the longitudinal axis of the bit and holding means including tongs bearing directly on the sides of said pointed end at the outer sides of said channels, in combination with a burner arranged opposite and presented to said pointed end of the bit to direct its flame directly on said pointed end and through said channels and means to secure said bit in such relation to the burner.

3. In a soldering iron, a bit having a pointed end and channels on opposite sides of said end and running at an angle to the longitudinal axis of the bit and holding means including tongs bearing directly on the sides of said pointed end at the outer sides of said channels, in combination with a burner arranged opposite and presented to said pointed end of the bit to direct its flame directly on said pointed end and through said channels and means to secure said bit in such relation to the burner, one of said tongs being fixed and arranged to engage one side of the bit and the other being pivoted and arranged to engage the opposite side of the bit, said tongs being secured on said burner.

4. In a soldering iron, a bit having a pointed end and channels on opposite sides

of said end and running at an angle to the longitudinal axis of the bit and holding means including tongs bearing directly on the sides of said pointed end at the outer sides of said channels, in combination with a burner arranged opposite and presented to said pointed end of the bit to direct its flame directly on said pointed end and through said channels, said tongs being arranged to secure said bit in such relation to the burner, one of said tongs being fixed and arranged to engage one side of the bit the other being pivoted and arranged to engage the opposite side of the bit, said tongs being secured on said burner, and means to secure said pivoted tongs when in engaged position with the bit.

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

JOSEPH ALOIS RUPPEL.

Witnesses:
W. W. SCHOTT,
C. C. L. B. WYLES.