

J. SEARS.
Soldering Tools.

No. 152,769.

Patented July 7, 1874.

FIG. 1.

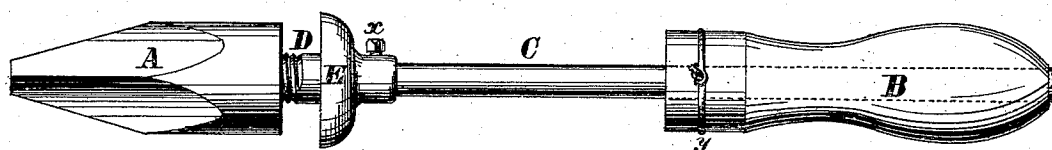


FIG. 2.

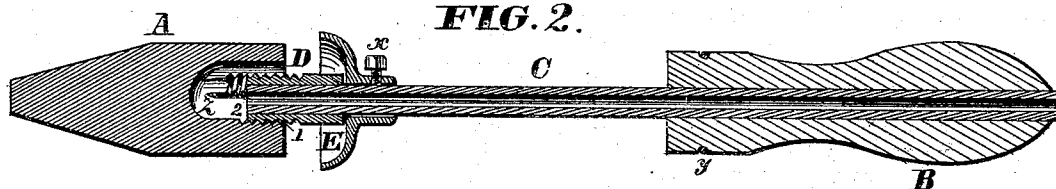


FIG. 3.

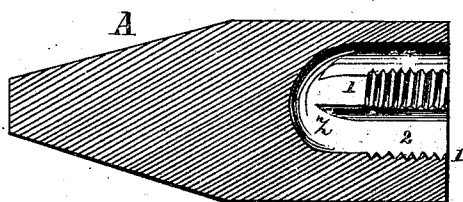


FIG. 4.

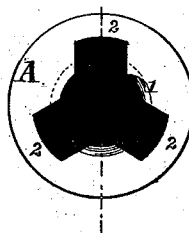


FIG. 5.

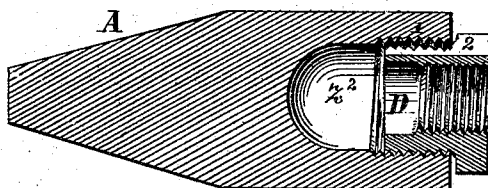
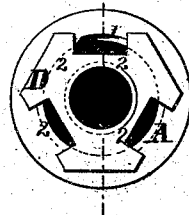


FIG. 6.



WITNESSES

Paul L. Swin
W. L. Farmer.

INVENTOR

Joseph Sears
By *Knights* Attorneys

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FIG. 7.

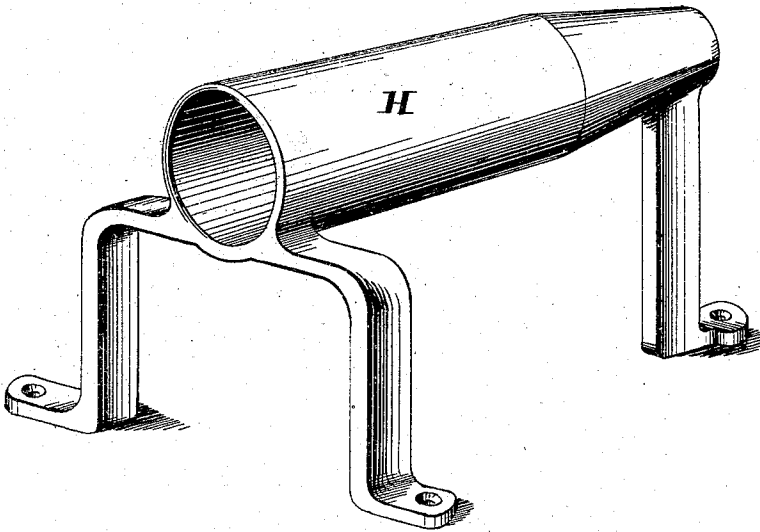
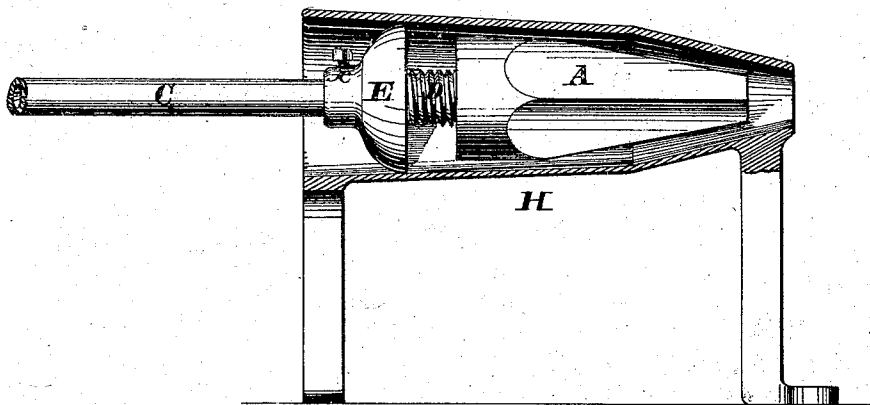


FIG. 8.



WITNESSES

Geo. L. Swin
H. C. Garner.

INVENTOR

Joseph Sears
By *Knights Bros* Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH SEARS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN SOLDERING-TOOLS.

Specification forming part of Letters Patent No. **152,769**, dated July 7, 1874; application filed April 7, 1874.

CASE A.

To all whom it may concern:

Be it known that I, JOSEPH SEARS, of the city of Chicago and county of Cook, in the State of Illinois, have invented an Improved Soldering-Tool, of which the following is a specification:

This invention relates primarily, as an improvement, to that form of soldering-iron described in Letters Patent of the United States, No. 137,244, issued to me on the 25th day of March, 1873; the same having a hollow tip, within which a heating-jet is sustained by properly-mingled gas and air conducted into the tip-cavity through a tubular handle.

The present invention consists, first, in a superior mode of coupling the hollow tip or copper to the handle-tube. The metal of which this part of the tool or iron is composed expands to such an extent and oxidizes so readily, especially at joints, that the proper attachment of hollow tips has been a matter of considerable practical difficulty. In the improved tool the joint is enveloped, while hot, by flame or gas, so as not to be exposed to the air, and, consequently, will not oxidize to any considerable extent. The flame-space is, at the same time, so formed as to present an extended heating-surface. The tightening of the joint, if it becomes loose, is provided for. The scrap-copper may be separated with facility when the tip is worn out, and a new tip may be screwed onto the same coupling tube or plug. The latter is also adapted to be readily and cheaply made, of small size, from gas-pipe; and the tip is adapted to be formed without the labor and waste of any turning operation. The invention consists, secondly, in a shield or deflector applied to the handle-shank, to turn back the hot products of combustion escaping from the rear end of the tip, so as to cause them to envelop the tip more perfectly, and thus assist the heating operation and retard oxidation. The shield or deflector operates also to throw the heat upon the work, so as to facilitate the soldering operation; it also operates to protect the hand while the tool is in use.

Figure 1 is a side elevation of a soldering-

iron, illustrating this invention. Fig. 2 is a longitudinal section of the same. Figs. 3 and 4 are, respectively, a longitudinal section and an end view of the improved tip shown in Figs. 1 and 2. Figs. 5 and 6 are similar views of a modified tip. Fig. 7 is a perspective view of a holder or rest adapted to support the iron while it is not in use, and to co-operate with the inclosed jet and the shield or deflector, for heating the copper and protecting it from oxidation. Fig. 8 is a vertical longitudinal section of the holder or rest, showing the iron in elevation within the same.

Like letters of reference indicate corresponding parts in all the figures.

This improved soldering-iron is composed of a hollow copper tip, A, a wooden handle, B, an axial tube, C, constituting the shank and core of the handle, a coupling tube or plug, D, for uniting the tip and handle-tube, and a shield or deflector, E, supported behind the tip, to throw the products of combustion back over the same, and to protect the hand of the operator. The tip or copper is made of suitable external shape for its work, and may be manufactured, for instance, by hammering or casting a solid blank, and then recessing and finishing it by dies in a drop-press, as more fully described in another specification. The tip-cavity *z* is tapped with a screw-thread, 1; and equidistant longitudinal passages 2 are formed around the same, for distributing the escaping products of combustion, and bringing them in contact with more surface. In the preferred form of tip, these passages 2 are formed by wings of the tip-cavity, as illustrated in Figs. 2 and 4, and the screw-thread 1 is tapped in inward projections, by which the passages are separated; but the passages 2 may be formed in the outer surface of a large plug or supplemental plug, D², to be used in connection with a circular tip-cavity, *z*², and a continuous screw-thread, 1, therein, as illustrated in Figs. 5 and 6.

The handle B in the illustration is wholly of wood, and tightened and strengthened by a wire, *y*, in a circumferential groove.

The handle-tube C consists of small gas-pipe, and, for the purposes of this invention, may be wholly plain, unthreaded, and unturned. It projects at the end of the handle sufficient to receive the end of a flexible tube, and extends into the tip-cavity as the burner.

Owing to the construction of the tip as above described, the plug D is adapted to be readily and cheaply made of gas-pipe, consisting of a short section of this material of the proper diameter. The plug may be permanently attached either to the handle-tube or to the tip, or separably to both. In the illustration, the plug is permanently attached to the handle-tube by driving it thereon, and its end is threaded, so as to screw into the tip, or into the plug or supplemental plug D², (shown in Figs. 5 and 6;) or the handle-tube may be screwed directly into the latter.

This supplemental plug D² is not illustrated as a modification of the plug D, as hereinafter claimed, but as a modification of the improved tip.

Owing to the relatively small size of the coupling-screw as formed by the plug D, it is not materially affected by the expansion of the tip, and the expansion of the tip does not otherwise strain or weaken any part. By partially unscrewing the tip, and compressing it within pointed jaws in a vise, it may readily be tightened up. By heating and thus expanding the worn-out tip, it may readily be screwed off, and the scrap-copper thus saved, and with equal facility a new tip may be applied. The plug may thus be made to answer for several tips.

The shield or deflector E is made of cast or malleable iron, and may be attached to the handle-tube behind the plug D by a set-screw, *x*, or it may be formed on or attached to the coupling tube or plug. The shield or deflect-

or is constructed with a concave face to increase its efficiency.

Figs. 7 and 8 illustrate the employment of a holder or rest, H, for supporting this improved iron while it is out of the hand, employed as illustrated, the same consisting of a horizontal tube open at both ends, of sufficient size to inclose the tip and deflector, and supported on the bench by one or more legs. The deflector closes the rear end of this holder, and the products of combustion are caused to escape through the other end, which is contracted around the point of the tip. But this holder or rest is the subject-matter, in part, of another invention, described in a separate specification of even date herewith.

The following is claimed as new in this invention, namely:

1. The imperforate hollow tip A, having an internal screw-thread, 1, and longitudinal escape-passages 2 extending outward through the rear end of the tip, substantially as herein shown and described, for the objects set forth.

2. The combination of the imperforate hollow tip A, having an internal screw-thread and longitudinal escape-passages in its rear end, the gas-pipe coupling or plug D, and the small handle-tube C within the latter, substantially as herein specified.

3. In combination with the hollow tip A, having a flame-cavity and open rear end, the shield or deflector E applied behind the tip to throw back the products of combustion, so as to cause them to envelop the tip, and to heat the work, and to protect the hand, as described.

In testimony of which invention I hereunto set my hand this 27th day of March, 1874.

Witnesses: JOSEPH SEARS.

HENRY MOREHOUSE,
HALSTED BURNET.