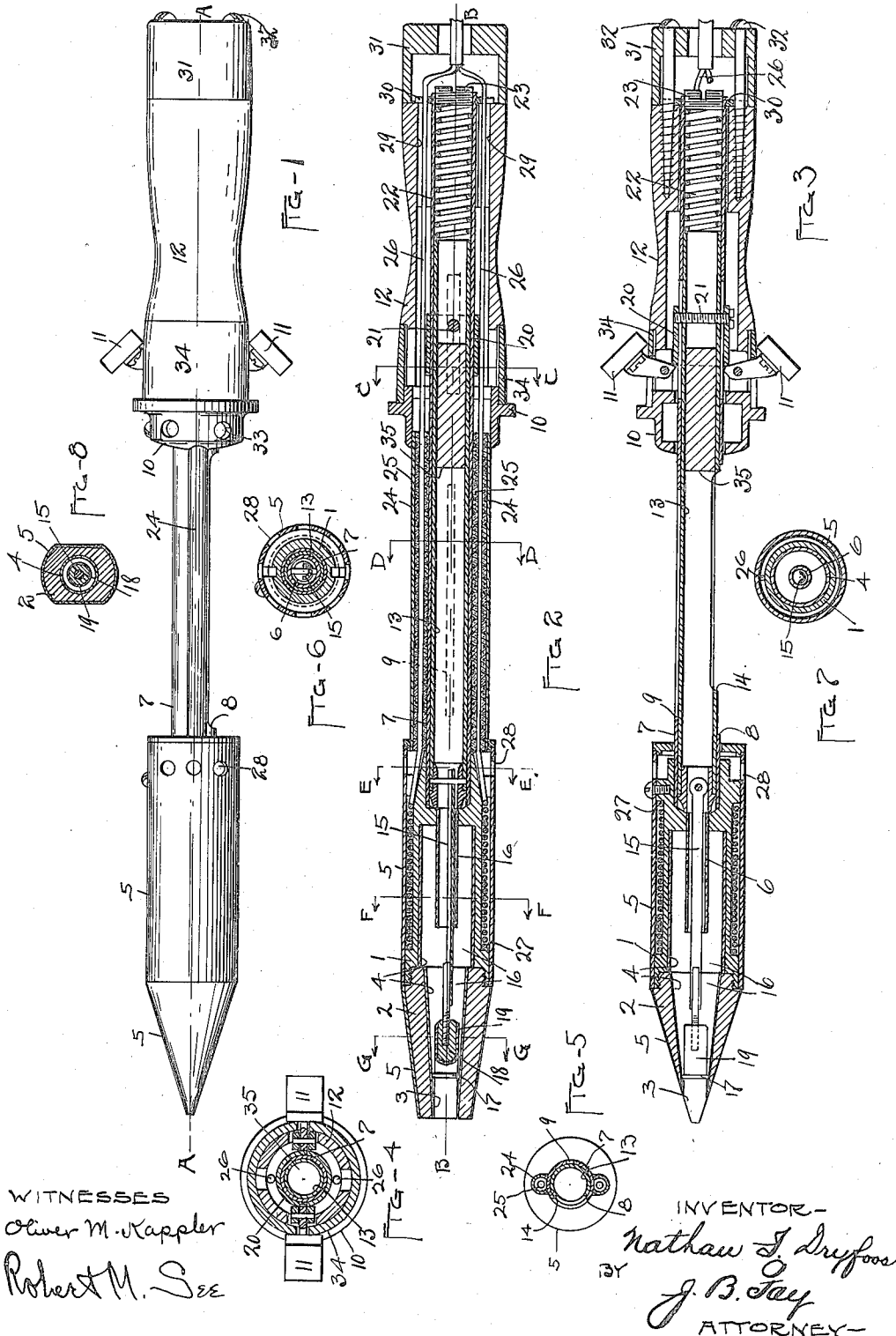


N. I. DRYFOOS.
SOLDERING TOOL.

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1,127,970.

Patented Feb. 9, 1915.



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NATHAN I. DRYFOOS, OF CLEVELAND, OHIO.

SOLDERING-TOOL.

1,127,970.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, NATHAN I. DRYFOOS, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Soldering-Tools, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The present invention relates to soldering tools, and its several characteristics will be disclosed by the following detailed description.

Said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of the various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:—Figure 1 is a side elevation of the improved tool; Fig. 2 is a section on the line A—A in Fig. 1; Fig. 3 is a section on the line B—B in Fig. 2; Fig. 4 is a section on the line C—C in Fig. 2; Fig. 5 is a section on the line D—D in Fig. 2; Fig. 6 is a section on the line E—E in Fig. 2; Fig. 7 is a section on the line F—F in Fig. 2, and Fig. 8 is a section on the line G—G in Fig. 2.

The tool comprises a head provided with a reservoir or chamber 16 and with an outlet 3, and the wall of the head, surrounding the chamber, is formed with a central portion of relatively good heat conducting material inclosed both interiorly and exteriorly by layers of protective material, and it is found that the best heat conducting material for the purpose is copper, and that the best protective coating is steel. A convenient method of constructing the head is to thread into the copper portion 1 a copper portion 2, both of these parts being interiorly protected by a steel layer 4, and exteriorly protected by a steel layer 5. A tube 6 is secured in the rear end of the head and extends into the chamber, while a tube 7 is secured to the head and extends outwardly therefrom, the tube 7 being provided laterally outside of the head with an opening 8 and, if desired, with an additional opening 9. A collar 10 is secured on the tube 7 and suitably pivoted

thereto are finger levers 11. A hollow handle 12 extends over the outer end of the tube 7 and is provided with suitable slots to receive the levers 11, and a fiber collar 34 fits on the collar 10 and handle 12 and is also provided with slots to receive the levers. Another tube 13 is reciprocable within the tube 7 and is provided with a lateral opening 14 designed to register with the opening 8. Pivotaly secured to the tube 13 is a rod 15 which extends through the tube 6 and has threaded on its lower end a valve for controlling the opening 3. The valve is constructed with an inner core of relatively good heat conducting material covered by a layer of protective material, these materials respectively being preferably copper 18 and steel 19, and the valve is provided with an annular rib 17. A collar 20 is slidably fitted on tube 7 and is fixedly secured to tube 13 by a screw 21 which extends through suitable slots in tube 7, and the inner ends of the levers 11 bear against the end of collar 20. A spring 22 abuts at its outer end against a screw 23 threaded in the end of tube 7, and at its inner end it abuts against the end of tube 13 and tends to hold that tube in such position as to thrust the valve to its closing position.

Suitably secured to the head of the tool and to the collar 10 are two tubes 24 in which are held a plurality of insulating beads 25, through which are threaded wires 26. The wires 26 are wound around the copper portion 1 of the head and within the steel layer 5, and this is desirably done by providing the copper portion 1 with a recess 27 to receive the wires. The handle 12 is provided with passages 29, through which the wires extend, and a cap 31 is secured on the outer end of the handle 12 by screws 32, a peripherally recessed washer 30 embracing the wires and screws. The head is provided with a plurality of ventilating holes 28, and the collar with a plurality of ventilating holes 33, and if desired, the inner tube may be stopped by a plug 35.

In operation, solder is inserted through the lateral openings in the two tubes and, an electric current being sent through the wires as the solder moves down toward the head, it is melted by the heat resulting from the current and flows into the chamber. As it flows into the chamber it is virtually trapped there against reverse flow into the tubes, for because of the relative diameter

of the chamber and the tube 6, the molten solder will flow back around the tube rather than into the tube. The operator then has a tool with the chambered head supplied with molten solder, and that solder can then be applied to the work exactly as desired by retracting the valve to any desired extent by means of the levers 11.

Copper has been almost exclusively used for the heads of soldering tools because of its heat conducting qualities, but it is subject to rapid wear because it is easily pitted by the tin in the solder and is necessarily frequently filed to produce a smooth surface, and is thus rapidly worn away. A converse objection arises from the fact that the copper pitted out unites with the solder and makes it sluggish and highly unsatisfactory. The present invention obviates these serious disadvantages by providing a copper head adapted to heat rapidly, but at the same time protecting the copper by a thin layer of steel. The copper throws its heat through the steel without any serious loss and yet no copper is presented to the solder, but instead the solder only contacts with the steel which is not pitted or injured by it. The necessity for re-filing constantly is eliminated, and the operator may thoroughly clean the tool at any time by merely wiping it off with waste. The valve pin is similarly constructed for the same purpose, and the annular ridge on the valve pin prevents the dry dross formed in a soldering tool from flowing down on the work.

The invention thus provides a highly improved soldering head which may, or may not, as desired, be used in what may be termed a fountain iron, for although it is shown in the latter combination in the drawing, it will be obvious that the improved head of copper or similar material protected by steel or similar material may be used without providing the head with a chamber. In the drawing, however, the improved head is shown in combination as part of an improved tool in which the solder may be inserted through the handle, and because of the relative disposition of the parts the solder will be melted as it reaches the head and will flow into the chamber within the head. After reaching the chamber the molten solder is substantially trapped against a reverse flow into the handle, and its flow from the point of the tool to the work is within the accurate control of the operator.

Other modes of applying the principle of my invention may be used instead of the one explained, change being made as regards the mechanism here disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. A soldering tool, comprising a head provided with a chamber having an outlet; a tube secured in said head and extending into said chamber; a second tube secured to said head and communicating with the chamber solely through the first tube; and a valve controlling said outlet.

2. A soldering tool, comprising a head provided with a chamber having an outlet; a tube secured in said head and extending into said chamber; a second tube secured to said head and communicating with the chamber solely through the first tube, the second tube having a lateral opening outside of the head; and a valve controlling said outlet.

3. A soldering tool, comprising a head provided with a chamber having an outlet; a tube secured in said head and extending into said chamber; a second tube secured to said head and communicating with the first tube, the second tube having a lateral opening outside of the head; a third tube reciprocable in the second tube and having a lateral opening registering with the opening in the second tube; and a valve connected with said third tube and controlling said outlet.

4. A soldering tool, comprising a head provided with a chamber having an outlet; a tube secured in said head and extending into said chamber; a second tube secured to said head and communicating with the first tube, the second tube having a lateral opening outside of the head; a third tube reciprocable in the second tube and having a lateral opening registering with the opening in the second tube; a valve connected with said third tube and controlling said outlet; a spring normally retaining the third tube in valve-closing position; and means adapted, on actuation, to move the third tube to valve-opening position.

Signed by me this 26th day of April, 1912.
NATHAN I. DRYFOOS.

Attested by—
ROBERT H. SEE,
D. T. DAVIES.