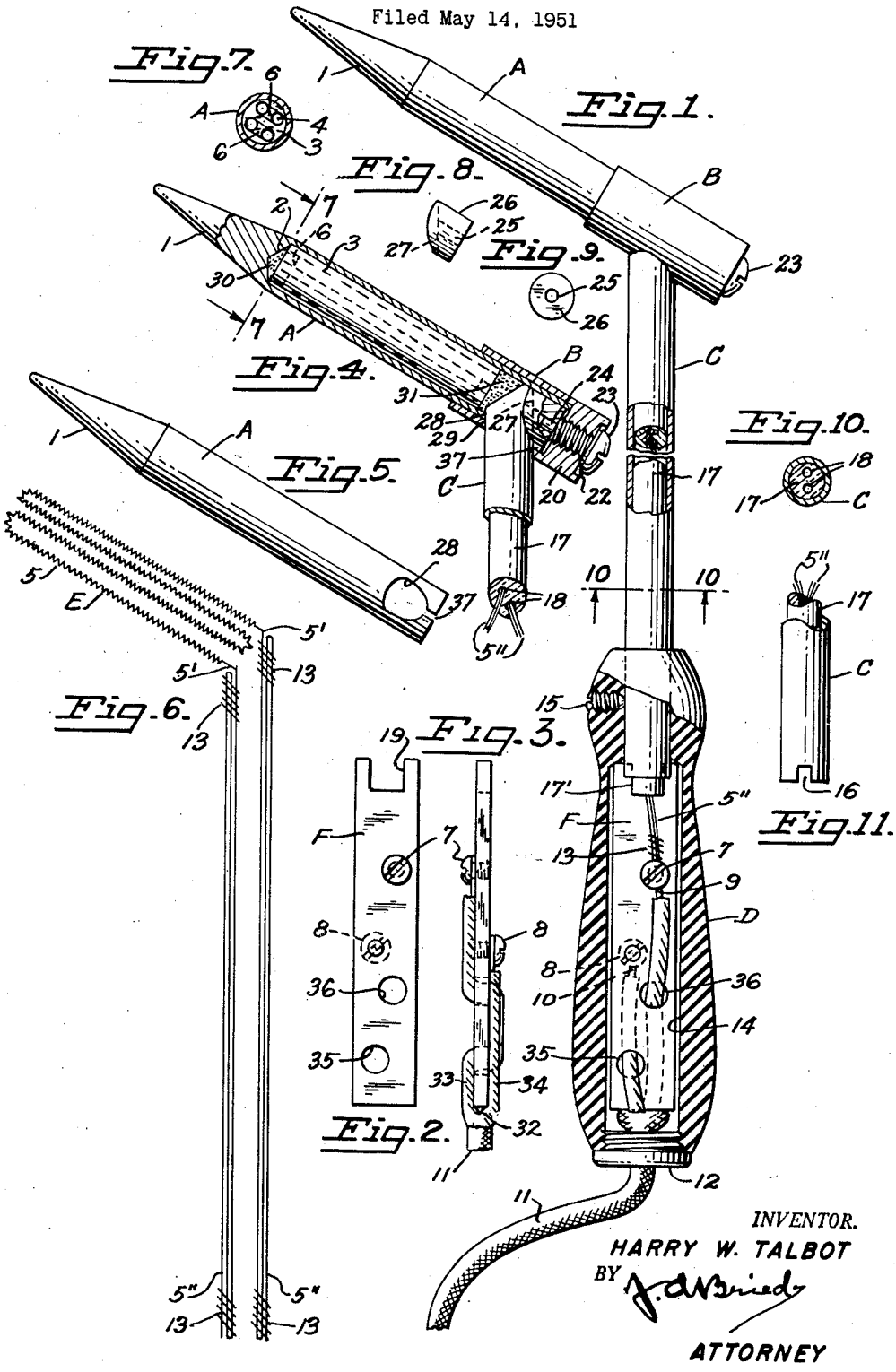
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ELECTRIC SOLDERING IRON

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ELECTRIC SOLDERING IRON

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This invention relates to electric soldering irons, and the principal object of the invention is to provide an improved, more durable construction, and which can be easily assembled and disassembled.

Particular advantages of the improvements will be disclosed in the following description and in the accompanying drawings.

In the drawings the main parts are lettered, A being the head, B the heel, C the tubular shank, D the hollow handle, E the heating coils, and F is the terminal plate.

Fig. 1 is a side elevation of my improved electric soldering iron with portion of the tubular shank C broken away, and with a portion of the hollow handle D broken away to reveal the lead-in electric connections.

Fig. 2 is a side view of the insulating terminal strip or plate F as removed from the handle D.

Fig. 3 is an edge view of the terminal plate of Fig. 2.

Fig. 4 is a longitudinal section of the head A of the soldering iron and its connection to the shank.

Fig. 5 is a bottom view of the head shown detached from its normally associated parts.

Fig. 6 is a diagrammatic view of the heating coils E and integral lead-in wires.

Fig. 7 is a cross section of the head A as seen along the line 7—7 of Fig. 2.

Fig. 8 is a detached side view of the saddle or angular locking block which locks the head A and heel B to the shank C at the desired angle.

Fig. 9 is an outer end view of the saddle block.

Fig. 10 is a cross section of the shank taken along the line 10—10 of Fig. 1.

Fig. 11 is a view of the lower portion of shank C taken at right angles to Fig. 1.

Before describing the improved construction of my electric soldering iron it may be stated that one of the important improvements is a disconnectable joint between the shank of the handle and the heel or rear portion of the soldering iron head, and also the elimination at that point, or in fact, at any point, of any electric connection between the heating coils and the lead in wires, the lead in wires being an integral extension of the heating coils.

The head A is of course formed of a good heat conducting metal such as copper, brass, or bronze, and is solid at its tip 1 and bored out or hollow from the point 2 through the rear end to receive a porcelain or other refractory cylindrical member 3 having four holes 4 extending longitudinally through it respectively for the four heating

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coils 5 which extend back and forth, and across the ends of the cylinder 3 in depressions 6. These coils are omitted in Figs. 4 and 7 to preserve clarity in the drawing.

The wire of the heating coils is not coiled beyond the rear end of the cylinder 3 but the two final ends 5' and 5' are continued integrally as lead-in wires all the way through the shank C and into the hollow handle D preferably made of insulating material to the terminal plate F where they are designated 5'' and are respectively secured by screws 7, 8, directly to the socket cord wires 9, 10. The cord itself before division is designated 11 and enters through a ferrule 12 of insulating material threaded into the outer end of the hollow handle.

Since the heating coils E are of resistance wire and the uncoiled extensions 5'' are integral extensions thereof their conductivity is multiplied several times to keep them cool. This is accomplished by looping both extension wires back and forth to make them double, triple, or quadruple, as may be desired and then twist each group together (or at the ends only will suffice) so as to insure their collective conductivity. This is indicated in Fig. 6 by the angular lines 13 crossing the several runs of the extension wires 5''.

Terminal plate F slides freely within the bore 14 of the handle, and tubular shank C slides snugly into a restriction of the handle bore at the upper end of the handle and is secured in place as by a set screw 15 preferably cupped at its impinging end to grip the shank or into a slight recess formed therein as well understood.

The lower end of the shank is cross slotted as shown at 16 in Fig. 11 to receive the upper end of the terminal plate F and prevent relative rotation, and within the shank is a long porcelain or other suitable refractory or insulator 17 pierced with two longitudinally extending holes 18 for the two groups of lead-in wires 5'', and which are maintained at opposite sides of the terminal plate by the notching or cross slotting of the shank tube C as explained.

Also to be noted is that the insulator 17 extends somewhat out beyond the end of the shank as shown at 17' in Fig. 1 and into a notch 19 formed in the upper end of the terminal plate F. This eliminates any relative twisting movement between the terminal plate and the insulator 17 and the shank C.

From the above described construction it will be seen that upon releasing set screw 15 and unscrewing the ferrule 12 the solid handle D may

be slid upward along the shank C to expose the connections and screws 7 and 8 for assembling or inspection.

The joint between the shank C and the soldering head is a point which has heretofore been a source of weakness, and difficulty to inspect, but which is overcome in the present construction wherein the rear end or "heel" of the soldering head A is covered by a thimble-like tubular member B which is of an inside diameter to slide snugly over the rear open end of member A and is closed at its rear end by a wall 20 which is preferably recessed slightly at its extreme end as at 22, and threaded through which end is a relatively large headed screw 23 preferably formed with a centrally extending tip 24 at its inner end which tip enters a hole 25 drilled through an angular saddle or locking block 26. This block is round to fit easily within tube A and it is hollowed at its forward end at an angle as at 27 to fit over the side of shank tube C which extends through coinciding openings in the walls of members A and B.

Fig. 5 shows the opening in the wall of member A designated at 28 and the coinciding opening in member B is indicated by the numeral 29 in Fig. 4.

At the upper end of the shank C and its contained insulator 17 both of these members are beveled off to allow the lead-wires to pass directly from the coils to the shank bores 18.

The angular extension of the soldering head A with respect to the handle shank C is preferably about as shown in the drawing, though it may be made at any other desired angle.

Since the shank tube C extends through coinciding holes in the walls of both members A and B which fit around the shank tube nicely, it is evident that any relative movement of these two members will grip or pinch the shank tube from opposite sides—and hence upon screwing the locking screw 23 inward it will push the locking block 26 against the shank which it partially embraces and by reacting against wall 20 will tend to pull the tubular portion of member B in the opposite direction, and thus lock all three members, A, B and C firmly together—yet permit easily disassembling of the parts upon merely loosening the locking screw 23.

Preferably the heating coils assembled in their refractory cylindrical member 3 are smeared with a suitable cement before being slid into place in the head member A, and the drill clearance is also filled with cement as at 30 and likewise as at 31 the space between the end of the shank porcelain or insulator 17 and the rear end of the heating coil refractory 3 so as to completely seal the heating coils with only the two lead-in continuations 5' of the heating coils (see Fig. 6) projecting. Thus the soldering head and its heating coils together with its extending lead wires (or groups rather) 5'' form an assembly or renewable unit, and the coils are effectually prevented from getting out of place or shorting.

In order to permit members B to be slid in place over member A while the long lead wire groups 5'' are extending from the member 3 already cemented in place, the opening 28 in member A (see Fig. 5) is slotted at 37 through the rear end of A. This permits the wires to be pushed inward out of the way as the tubular portion of B passes over the outer sides of A until the openings 28, 29 begin to overlap.

A feature of importance which prevents injury to the cord 11 connections in the handle if the cord is pulled, is the manner in which the cord is split at 32 and spread to opposite sides of the terminal plate F and the two sections 33 and 44 passed respectively through holes 35 and 36 to opposite sides of the plate and their final ends 9 and 10 wrapped around the binding screws 7 and 8 at opposite sides of the plate, and which screws also simultaneously secure the ends of the coil extension groups of wires 5''. This terminal plate assemblage as described is forced upward to the end of the larger bore of the handle by the screwing in place of the ferrule 12.

Having thus described the improved construction of my electric soldering iron and the manner in which the novel features are assembled what I claim is:

1. In an electric soldering iron having a soldering head with a hollow shank extending therefrom with a hollow handle at its end and electric lead wires extending through the shank into the handle to an insulating terminal plate located therein, said plate being elongated and said handle being open at both ends with said shank extending into one end, the opening in the opposite end being large enough to pass said plate and said plate insertable through said opposite end, and the end of the plate engaging a notch in the adjacent end of the shank to prevent relative twisting movement and a twin bored insulator rod enclosed in said shank with a lead wire in each bore, and the end of said insulator rod adjacent the handle extending beyond the end of said shank and into a notch in said plate with its bore holes directed along opposite sides of the plate respectively and means for securing said handle to said shank, and upon releasing of which said handle may be slid longitudinally along said shank to expose said plate.

2. In an electric soldering iron having a soldering head with a heating coil within and a handle shank extending from one side of the head adjacent the rear end thereof, the improvement which comprises means detachably securing said shank to said head including at least the rear end of said head being tubular and said shank being tubular, and the end of the shank passing through an opening in the side of the tubular portion of and extending materially within said head, and a screw arranged for forcing the two tubular members in tightly engaging contact where they cross at said opening.

3. In an electric soldering iron having a soldering head with a heating coil within and a handle shank extending from one side of the head adjacent the rear end thereof, the improvement which comprises means detachably securing said shank to said head including at least the rear end of said head being tubular, a second tubular member closed at one end and with its open end slidably telescoped on the rear end of said head, said shank also being tubular and of smaller diameter than said head and with its end extended through and past coinciding openings formed in the sides of the telescoped members, and a screw passing through the closed end of said second tubular member arranged to force said telescoped members toward relative movement for gripping said shank where it crosses them.

4. In an electric soldering iron having a soldering head with a heating coil within and a handle shank extending from one side of the head adjacent the rear end thereof, the improvement which comprises means detachably securing said shank to said head including at least the rear end of

said head being tubular, a second tubular member closed at one end and with its open end slidably telescoped on the rear end of said head, said shank also being tubular and of smaller diameter than said head and with its end extended through and past coinciding openings formed in the sides of and well within the telescoped members, a screw passing through the closed end of said second tubular member, and a loose block within the telescoped members saddled against the inwardly projecting end of said shank and impinged by said screw.

5. In an electric soldering iron having a soldering head with a heating coil within and a handle shank extending from one side of the head adjacent the rear end thereof, the improvement which comprises means detachably securing said shank to said head including at least the rear end of said head being tubular and said shank being tubular, and the end of the shank passing through an opening in the side of the tubular portion of and materially into said head and a loose saddle block slidably positioned within the rear portion

of said head and saddled at an angle against the rear side of said shank and means for forcing said saddle block against said shank to lock it in angular extension from said head.

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