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TOOLS FOR GRIPPING AND SUPPORTING ARTICLES

Filed March 1, 1965

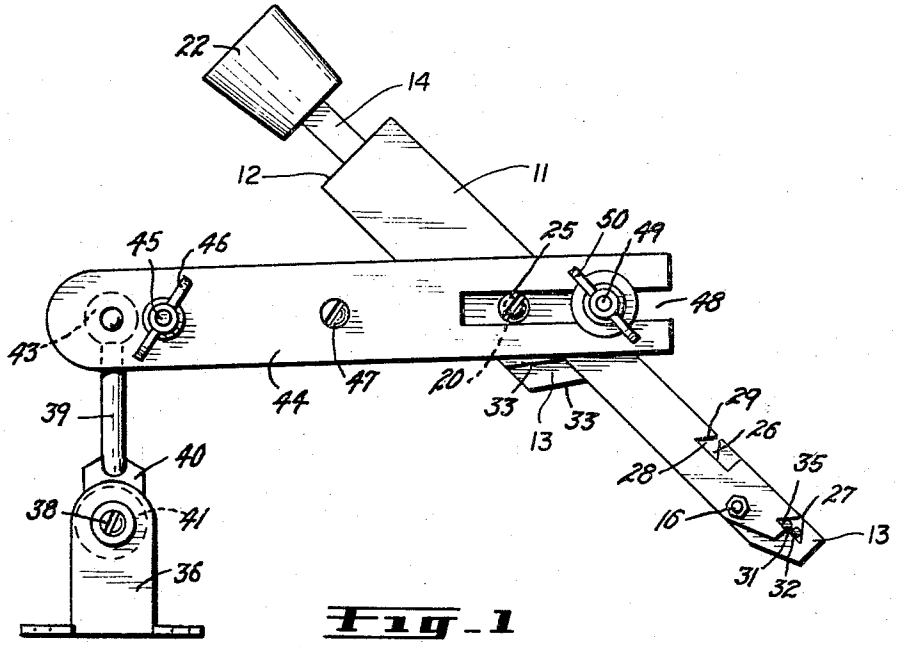


Fig_1

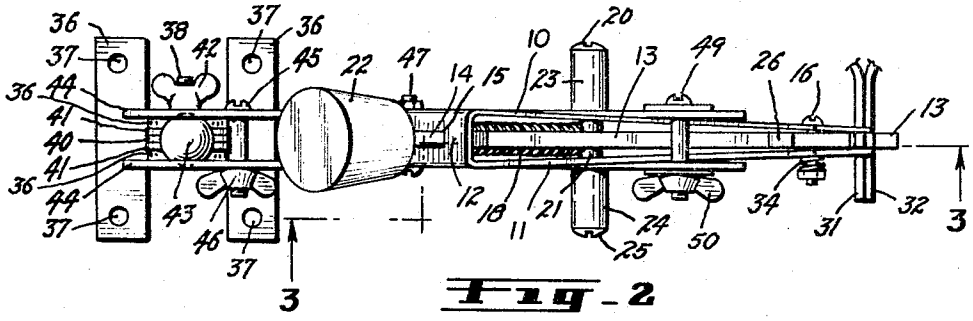


Fig_2

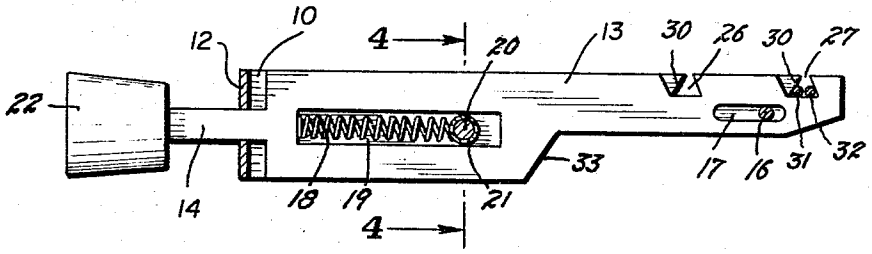


Fig_3

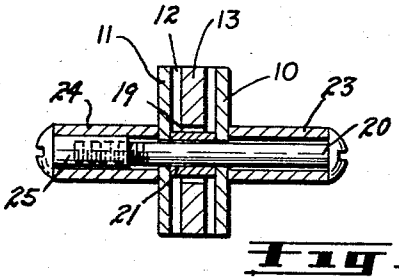


Fig_4

INVENTOR.
CHARLES H. SCHETZER
BY
ATTORNEY

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TOOLS FOR GRIPPING AND SUPPORTING ARTICLES

Charles H. Schetzer, 17th and Caldwell, Apt. 7, Goodland, Kans. 67735

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This invention relates to a spring-loaded tool more particularly designed for use by electronic technicians and other mecahnics for clamping and holding wires and other small parts in place to facilitate connecting and soldering operations.

The principal object of the invention is to provide a simple and highly efficient hand clamp which can be held and completely operated by one hand leaving the other hand free for manipulating a tool such as a soldering iron or torch upon the work.

A further object is to provide a universally, movable bench-mounted holder in which the above hand clamp tool can be quickly and easily placed and which can be fixedly mounted on a bench or other supporting surface for holding the clamp and the work in any desired fixed position.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is made to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

FIG. 1 is a side elevational view of the hand clamp assembled in its holder and in position for use;

FIG 2 is a top plan view of FIG. 1;

FIG. 3 is a detail, longitudinal section, taken on the line 3, FIG. 2, through the clamp, per se, removed from the holder; and

FIG. 4 is a detail, enlarged, cross-section through the hand clamp, taken on the line 4—4, FIG. 3.

The hand clamp portion of the device comprises an elongated, resilient, metal strip which is bent in a close U-shape to form two similar side members **10** and **11** joined at their rear extremities by a bight **12**. An elongated clamping bar **13** is slidably positioned between the two side members **10** and **11**. The clamping bar **13** is provided with a stem portion **14** which extends rearwardly through a guide opening **15** in the bight **12** to support the rear extremity of the clamping bar between the side members **10** and **11**. The forward extremity of the clamping bar is supported and guided by means of a clamp bolt **16** which extends through and between the side members and through a longitudinally elongated guide slot **17** adjacent the forward extremity of the clamping bar **13**. The clamp bolt **16** is preferably provided with a tensioning spring **34** to maintain the side plates in frictional engagement with the clamping bar.

The clamping bar is constantly urged rearwardly by means of a compression spring **18**, which is maintained in position in a longitudinally-elongated spring slot **19** in the clamping bar **13** by the side members **10** and **11**. A finger bolt **20** extends through the side members **10** and **11** and through a spacer bushing **21** which is positioned in the forward extemity of the spring slot **19**. The spring **18** is compressed between the rear extremity of the spring slot **19** and the spacer bushing **21** to resiliently and continuously urge the clamping bar **13** to its rearmost position. The rear extremity of the stem portion **14** is provided with a palm knob **22** and the finger bolt **20** is provided with two finger sleeves **23** and **24** which surround the bolt and project oppositely-outward from the clamp. The finger

sleeve **23** is clamped against the side member **10** by the head of the bolt **20** and the finger sleeve **24** is similarly clamped against the side member **11** by means of a tubular, screw-driver-slotted nut **25** threaded onto the threaded extremity of the bolt.

The clamp may be conveniently and securely held in the hand by placing the palm knob **22** in the palm of the hand with the first and second fingers hooked over and about the finger sleeves **23** and **24**. Thus the side members **10** and **11** can be drawn rearwardly on the clamping bar **13**, against the bias of the spring **18**, by simply contracting the supporting hand.

The clamping bar is provided with spaced work-gripping notches **26** and **27** in its upper edge and adjacent its forward extremity. The side members **10** and **11** are provided with aligned side work-gripping notches **28** which align with the notch **26**, when the clamping bar is fully retracted againts the spring **18** and which fully close the notch **26** when the clamping bar is released. The forward extremities of the side members are positioned to close the notch **27** when the clamping bar is fully retracted. The latter extremities are notched, as indicated at **35** to grip the work. The rear extremities of the work-gripping notches **28** are inclined rearwardly, as indicated at **29**, and the forward extremities of the notches **26** and **27** are inclined forwardly, as indicated at **30**, to exert a wedging and gripping action on the work.

It is believed that the use of the hand clamp will be apparent from the above. Briefly, the clamp is held in one hand. The hand is then contracted to receive the work, such as two wires, indicated at **31** and **32**, to be soldered together. The wires **31** and **32** are placed in either set of aligned work-receiving notches and the hand-clamping action is released sufficiently to allow the spring to urge the side members **10** and **11** forwardly to close the notches and grip the work. The completed work is released by simply contracting the hand.

The lower edge of the clamping bar and the lower edges of the side members are preferably vertically narrowed at their forward extremities as illustrated at **33** to facilitate their insertion into intricate work.

For convenience a holder is provided for use exclusively with the above described tool as shown in FIGS. 1 and 2. The holder comprises a base fitting **36**, adapted to be mounted on a work bench or other supporting surface by screws or bolts inserted through suitable screw holes **37**, and having two upstanding ears **51** which support a hinge bolt **38**. A post **39**, having a flattened lower extremity **40**, is tiltably mounted on the hinge bolt **38**, between suitable spacing washers **41**, and can be clamped in any desired vertical-angular position by means of a suitable wing nut **42**. The upper extremity of the post terminates in a universal ball joint **43** against the opposite sides of which the rear extremities of two flat, elongated side arms **44** are clamped by means of suitable clamp bolt **45** and wing nut **46**. The side arms are maintained in alignment with each other by an intermediate bolt **47** passing through both of the arms. The forward extremities of the side arms are bifurcated in alignment with each other, by means of furcations **48**. The previously described tool is slid between the forward extremities of the arms **44** with the finger sleeves **23** and **24** projecting outwardly through the furcations **48** and the tool is clamped in any desired angular position between the side arms by means of a second clamp bolt **49** which also passes through the furcations and which is provided with a second wing nut **50**.

It can be seen that the universality of movement of the above holder allows the work held in the gripping tool to be positioned and held in any desired position.

It is preferred to form the hand clamp portion of the device from aluminum to prevent the adherence of solder. The use of aluminum also facilitates the use of the in-

vention as a "heat" sink for dissipating heat from wires being soldered to heat sensitive transistors and the like.

It is desired to call attention to the fact that the usual hand clamp or vise cannot grip two wires of differing diameters simultaneously. With the use of this improved clamp each of two differing diameter wires will be wedged against the inclined sides of the gripping notches so that both will be tightly gripped. For exceeding close detailed work the bolt **16** may be replaced by a tubular rivet to conserve space at the tip of the tool.

While a specific form of the invention has been described and illustrated herein, it is to be understood that the same may be varied within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. A work-clamping tool comprising: two flat-elongated side members; a bight joining said side members in parallel relation at their rear extremities; a work-receiving notch formed in the upper edge of each side member, said notches being aligned with each other; a flat, elongated, clamping bar slidably-positioned between said two side members; a work-gripping notch formed in the upper edge of said clamping bar; manually-operated means for relatively and longitudinally sliding said side members and said clamping bar to align said work-gripping notch with said work-receving notches in said side members, resilient means urging said work-clamping notch out of alignment with said work-receiving notches to exert a clamping action on the work; said manually operated means comprising a stem formed on the rear extremity of said clamping bar and extending rearwardly and slidably through a guide opening in said bight; a hand-engaging knob formed on the rear extremity of said stem; said resilient means comprising a compression spring positioned in a longitudinally-extending spring slot in said clamping bar; and a bolt element fixed to and extending between and through said side members and through the forward extremity of said spring slot, said spring being compressed between said bolt and the rear extremity of said spring slot to constantly urge said clamping bar rearwardly.

2. A work-clamping tool as described in claim **1** in which said bolt projects oppositely outward from the side members and having finger sleeves mounted on the projecting extremities of said bolt to be engaged by the fingers of the hand engaging said knob.

3. A work-clamping tool comprising: two flat, elongated, aligned, spaced-apart side members joined at their rear extremities and extending forwardly in substantially parallel relation; a flat, elongated clamping bar longitudinally slidable between said side members; means acting to maintain said side members and said clamping bar in horizontal alignment; a work-receiving notch formed in the upper edge of said clamping bar; spring-actuated means urging said side members forwardly to tend to close the opposite sides of said notch to grip the work therein; a fitting adapted to be mounted on a supporting surface; a post pivotally and lockably mounted on said fitting; a ball fixedly carried on said post; two elongated, flat side arms clamped at their rear extremities on opposite sides of said ball and receiving said combined side members between their forward extremities; and means for drawing said side arms toward each other to clamp said side members in place.

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ROBERT C. RIORDON, *Primary Examiner.*

LESTER M. SWINGLE, *Examiner.*

J. F. McKEOWN, *Assistant Examiner.*