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O. E. JOHNSON
WIRE TWISTING APPARATUS
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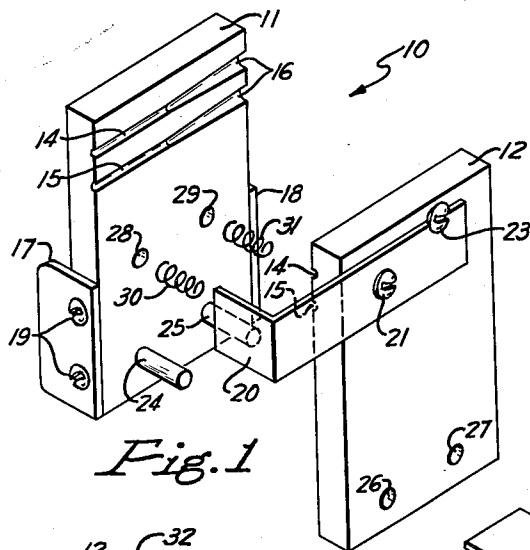


Fig. 1

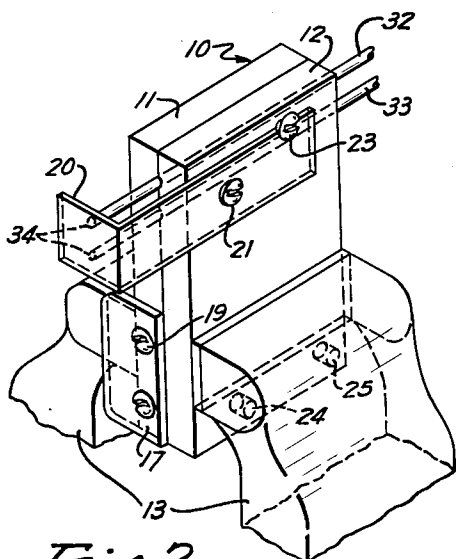


Fig. 2

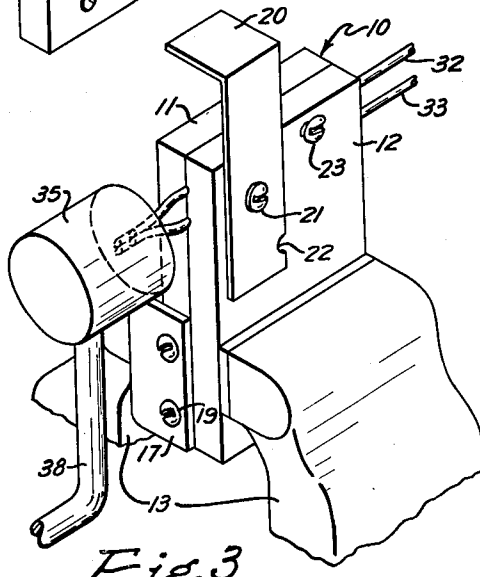


Fig. 3

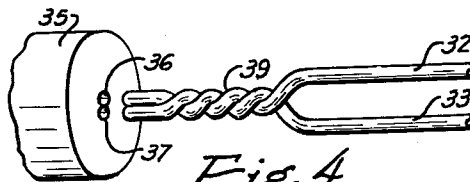


Fig. 4

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WIRE TWISTING APPARATUS

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1 Claim. (Cl. 140—119)

This invention relates to a wire twisting device.

In many applications, for example, in the preparation of thermocouples it is the practice to twist together two or more strands of wire. To accomplish the wire twisting operation various wire twisting devices have been developed in the prior art. Also, such operations are frequently carried out manually using a vise and a pair of pliers. However, when carrying out wire twisting operations manually or by means of the prior art devices various disadvantages are encountered. For example, the shape and uniformity of the wire splice can not be accurately controlled and the straight portions of the wires which are not intended to form part of the twist usually undergo bending and other deformations. To overcome these disadvantages, I have developed a wire twisting device which enables uniform wire splices or twists to be made while avoiding bends or other deformations in the straight portions of the wires. Furthermore, my novel wire twisting device provides means to accurately measure and limit the portions of the individual wire strands which are to form the twist, resulting in wire splices which are uniform and of controlled shape and size.

In accordance with my invention I provide a wire twisting device, having a jig assembly adapted to fit in a vise and carrying a wire measuring gauge, and a rotatable head member for acting on the ends of the wires to twist the same.

More particularly stated, the invention provides a wire twisting device having a jig assembly formed of two parallel die plates each having semicircular, matched grooves on the inner facing surfaces thereof. The jig assembly is adapted to fit in a vise by which means the die plates are clamped together with the matched grooves on each die plate coming together to form circular passages for insertion of the wires to be twisted. A measuring gauge is swivelly mounted on the exterior of one of the die plates to measure and limit the portions of the wires which are to form the twist. A rotatable head member having spaced apertures in one end to receive the wires therein, is provided to perform the twisting operation. The head member is adapted to be attached at its free end to any suitable means for rotating it, for example a carpenter's brace.

A preferred embodiment of the invention has been chosen for purpose of illustration and description and is shown in the accompanying drawings which form a part of the specification, wherein:

Figure 1 is a detailed view of the jig assembly with the die plates separated.

Figure 2 is a perspective view of the device of the invention showing the jig assembly with the die plates clamped together and the wire measuring gauge in position to adjust the length of the wire ends.

Figure 3 is a perspective view of the apparatus of the invention showing the rotatable head member engaging the wire ends and showing the position of the wire measuring gauge while the twisting operation is being carried out.

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Figure 4 is a detailed view of a finished wire twist produced by the apparatus of the invention.

Referring now more particularly to the drawings, the jig assembly is designated generally by the numeral 10 and is composed of two parallel die plates 11 and 12. As shown in Figures 2 and 3, the die plates 11 and 12 are adapted to be clamped together by any suitable means such as a vise, the jaws of which are partially shown at 13. On the inner facing surfaces of die plates 11 and 12 there are provided semicircular grooves 14 and 15. The grooves 14 and 15 on the die plates 11 and 12 are matched so that when the plates are clamped together, the grooves 14 and 15 form circular passages extending the width of the die plates. As shown in Figure 1, the die plates 11 and 12 are made relatively wide to securely engage a sufficient portion of the wires so as to prevent any deformation when the twisting operation is applied to the ends of the wires. Preferably the ratio of the width of the die plates 11 and 12 to the diameter of the circular passages formed by grooves 14 and 15 should be about 20 to 1. Grooves 14 and 15 are flared or funnel shaped at one end as at 16 to permit easy insertion of the wires.

Flanges 17 and 18 bolted as at 19 to each end of die plate 11 enable the jig assembly to be positioned securely within the jaws of vise 13. On the exterior surface of die plate 12 is a measuring gauge 20 which swivels on pin 21. Gauge 20 is adapted to be positioned in either a horizontal or vertical plane. When the gauge 20 is in the horizontal position, that is, when it is performing its measuring or adjusting function, groove 22 engages stop pin 23 which prevents further movement of the gauge and thereby insures accurate measurement. Die plate 11 is provided with projecting guide pins 24 and 25 while die plate 12 is provided with matching guide pin holes 26 and 27. Guide pin holes 26 and 27 receive guide pins 24 and 25 respectively when die plates 11 and 12 are clamped together and aid in the proper alignment thereof. The die plates 11 and 12 are each provided with annular recesses as at 28 and 29 to hold containing springs 30 and 31. Springs 30 and 31 serve to separate die plates 11 and 12 when the vise is released.

In operation as shown in Figures 2 and 3 wires 32 and 33 are inserted in the flared ends 16 of grooves 14 and 15 while the die plates are held slightly open within the jaws of vise 13. Measuring gauge 20 is swivelled to its horizontal position and wires 32 and 33 are positioned within the grooves 14 and 15 so that the projecting ends of the wires exactly contact the end of the gauge as at 34. In this manner the projecting ends of wires 32 and 33 are maintained equal, thus insuring a uniform splice. The jaws of the vise 13 are then tightened to securely clamp wires 32 and 33 in correct position. Wire measuring gauge 20 is then swiveled to a vertical position as shown in Figure 3 and the measured end of wires 32 and 33 are free to be twisted by rotatable head member 35. To perform the twisting, rotatable head member 35 is brought into position so that the projecting ends of wires 32 and 33 are received in spaced apertures 36 and 37 which are provided in one end of head member 35. The rotatable head member 35 is attached to a suitable means for rotating it such as a carpenter's brace which is partially shown at 38. The proper number of rotations are then applied to produce the desired twist or splice. The head member 35 is then disengaged from the wire ends and the vise 13 is released permitting springs 30 and 31 to separate the die plates 11 and 12. Wires 32 and 33 with the ends spliced as at 39 are then removed from engagement with grooves 14 and 15.

It will be understood that the dimensions of the various members of the disclosed device are dependent upon the size of the wire which is to be twisted. Thus, the size of the rotatable head member 35, the spacing of the aper-

tures 36 and 37 within the head member, the length and size of the measuring gauge 20 may all be varied according to the circumstances. The passages 14 and 15 are at all times made large enough to permit easy insertion of the wires which are to be twisted.

It is apparent from the foregoing description that the invention discloses a convenient and inexpensive device which can be easily and quickly operated to produce any number of uniform wire splices. The device is especially advantageous in that it permits the production of wire splices of exact size and shape while avoiding any deformation in those portions of the wires which do not form the twist. This feature is especially important in many electrical or similar applications where neatness and smooth, uniform finishes are required. As for example, in the preparation of electrical thermocouples, porcelain insulators are normally placed over the straight portions of the wires. In this instance it is especially desirable that the straight portions of the wires be free of bends so that the insulators will slide all the way down to the twist and fit snugly on the wires. The device of the present invention is admirably suited to perform such wire twisting operations.

Resort may be had to such modifications and variations as fall within the spirit of the invention and the scope of the appended claim.

Having described my invention as set forth above, I claim:

A wire twisting apparatus comprising in combination

two parallel die plates, the die plates being provided on the inner surface with spaced matching grooves which flare at one end for receiving and securing wire therein, while permitting the free ends of the wires to project therefrom, one of said die plates provided at each end with flange members which enable the die plates to be fitted within a vise, the said die plate further provided with two lateral projections adapted to fit in corresponding apertures within the opposed die plate, each of the said die plates having annular recesses on the inner faces thereof, spring means disposed between the spaced die plates to fit within the said annular recesses, a wire measuring gauge pivotally mounted on the exterior of one of said die plates adapted to reciprocate between a vertical and horizontal position to limit and maintain equal the length of the wires projecting from said die plates whereby a uniform wire twist is achieved, a rotatable member provided with spaced apertures for engaging and rotating the projecting ends of the wires.

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