

[54] **ELECTRICIAN'S WIRE BENDING TOOL**

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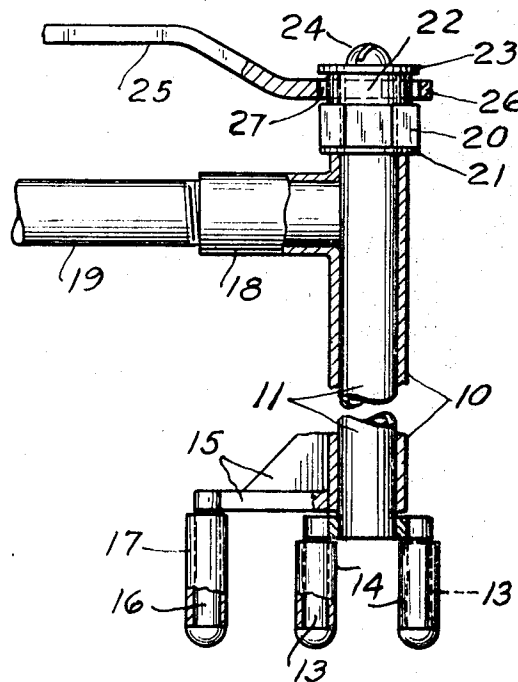
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[57] **ABSTRACT**

This tool is suitable for bending and shaping wires which extend through the walls of meter bases and like electrical receptacles into the same in attaching the wires to terminals. The tool comprises a shaft rotatable within a frame tube, lever arms to relatively rotate the shaft and tube, a cross member rigid with the inner end of the shaft, two diametrically spaced apart wire bending pins protruding from the cross member, a radial arm rigid with and extending sidewise from the inner end of the frame tube, and a third pin rigid with the outer end of the arm and movable in a circular path around the other two pins. Short sharp bends can be made with the two spaced apart pins. The third pin helps in holding the wire and making longer bends.

19 Claims, 5 Drawing Figures



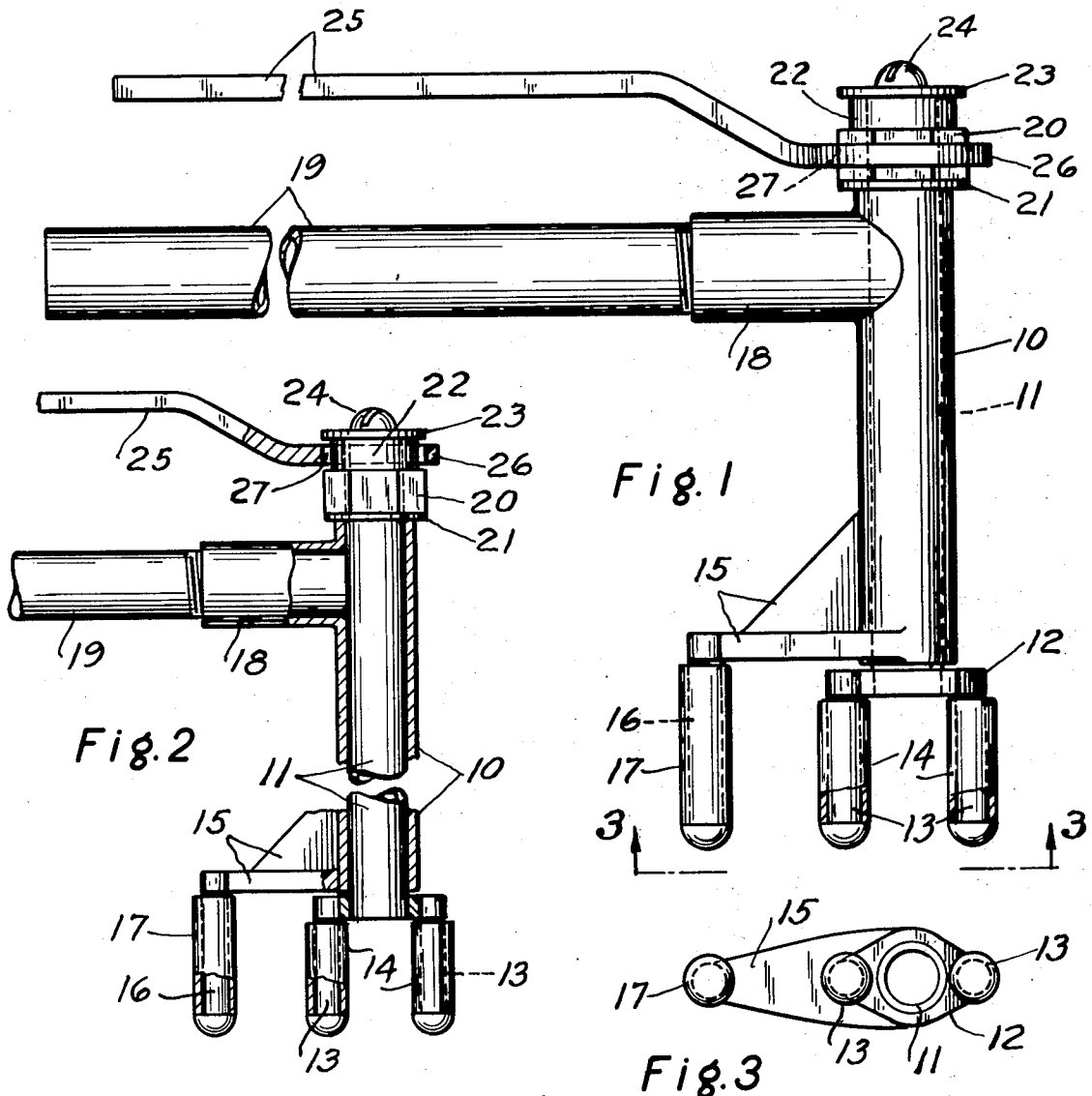


Fig. 1

Fig. 2

Fig. 3

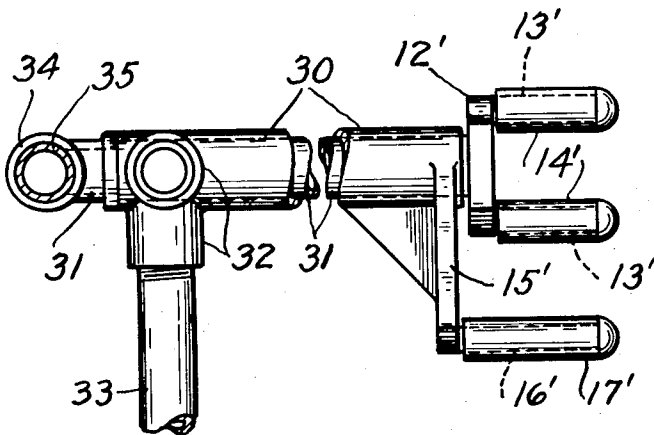


Fig. 5

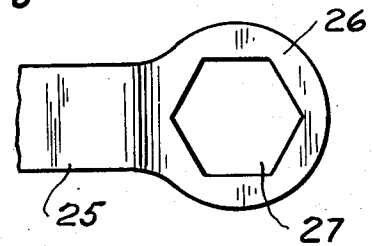
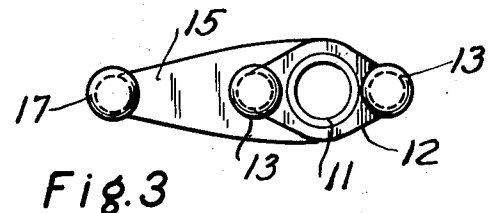


Fig. 4

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## ELECTRICIAN'S WIRE BENDING TOOL

## BACKGROUND OF THE INVENTION

In electrical installations the current supply wires are often of fairly large diameter and heavily covered with insulation. This makes them stiff and hard to bend. In residential buildings the wires usually pass from a wall through the bottom of a meter base and they must be bent to various shapes and connected to terminals on the meter base. In larger commercial installations they usually pass from a wall through the bottom of fairly large receptacles and must be bent and connected with terminals in the receptacles. Usually these wires are manually bent to the desired shape by the wiremen and their bending is arduous and time consuming.

## BRIEF SUMMARY OF THE INVENTION

An object of my invention is to provide a wire bending tool which will save both time and labor by making it easier for wiremen to bend the wires in making electrical installations.

Another object is to provide a wire bending tool comprising a frame tube, a shaft rotatively supported in and extending through the frame tube, two lever arms connected respectively with the outer end portions of the frame tube and shaft, whereby said tube and shaft can be rotatively moved relative to each other, a transverse pin carrying member rigid with the inner end of the shaft, two spaced apart wire bending pins rigid with and protruding perpendicularly from said pin carrying member, a pin carrying arm secured to and protruding transversely from the inner end portion of said frame tube, and a third wire engaging pin rigid with and protruding from the outer end portion of said pin carrying arm and movable around said two first mentioned pins by relative rotation of said shaft and tube.

Another object is to provide a wire bending tool having a wire bending head provided with two spaced apart pins movable about a common center in a circular path and adapted to fit over and straddle a wire to be bent and further provided with a third pin movable in a circular path around said first mentioned two pins and adapted to contact and hold and bend a wire which passes between said two pins.

Another object is to provide a wire bending tool having two operating levers which are adjustable relative to each other and can be relatively positioned after the tool is applied to a wire so that force can be most advantageously applied to them in bending the wire.

Other objects will be apparent from this description and the accompanying drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view in side elevation of a wire bending tool embodying my invention.

FIG. 2 is a sectional view of said tool with parts broken away and parts shown in elevation.

FIG. 3 is a view looking in the direction indicated by line 3—3 of FIG. 1 and showing a wire bending head.

FIG. 4 is a detached fragmentary plan view showing one end portion of a lever arm.

FIG. 5 is a side elevational view, with parts broken away and on a smaller scale than the other views, showing a wire bending tool of modified form.

Like reference numerals refer to like parts throughout the several views.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

The tool shown in FIGS. 1 to 4 comprises a frame tube 10 within which a shaft 11 is rotatively supported. A pin carrying member 12 is rigidly attached to the end of the shaft 11 shown lowermost in FIGS. 1 and 2 and two spaced apart wire bending pins 13 are rigid with the pin carrying member 12 at opposite sides of the common axis of tube 10 and shaft 11 and protrude approximately perpendicularly therefrom.

Parts shown lowermost in FIGS. 1 and 2 are herein referred to as being at the inner end and those shown uppermost as being at the outer end of the tool.

Preferably a rotary sleeve 14 in the form of a thin metal tube is carried on each pin 13 and serves as an anti-friction device.

A pin carrying arm 15 of substantial length is rigid with and protrudes transversely from the inner end portion of the frame tube 10 close to but outwardly from and clear of the pin carrying member 12. A wire engaging pin 16 is rigid with the outer end portion of the arm 15 and protrudes transversely therefrom in the same direction as the two pins 13. A sleeve 17 is rotatable on pin 16.

The two pins 13 and the pin 16 are all substantially parallel and they operate alongside of each other. Rotation of the shaft 11 will move the two pins 13 in a circular path of smaller diameter for making shorter bends and rotation of the tube 10 will move the pin 16 in a circular path of larger diameter around the pins 13 in making longer or less sharp bends.

An internally threaded coupling member 18 is welded to the outer end portion of the frame tube 10 and protrudes transversely therefrom and a handle member 19 is threaded into said coupling 18 and serves as a lever arm.

The outer end of the shaft 11 carries a rigidly attached lever receiving head comprising a non-cylindrical head part 20 having a plurality of symmetrical flat sides. Preferably but not essentially part 20 is hexagonal. An outwardly protruding stop flange is provided at the location where part 20 is connected with shaft 11. A head part 22 of smaller size than head part 20 is integral with the outer end of said larger head part 20 and a stop washer 23 overhangs the outer end of smaller head part 22 and is secured to head part 22 by a screw 24.

A lever arm 25 is carried by head parts 20 and 22. This lever 25 has a larger end part 26 provided with a hexagonal opening 27 shaped and dimensioned to fit snugly and adjustably over the larger head part 20 and which will fit rotatively over the smaller head part 22. This allows the lever arm 25 to be quickly and easily adjusted into different positions on the head part 20, without detaching said lever from the tool, by moving it onto the head part 22. Also this makes it possible to adjust the position of the lever arm 25 relative to the lever arm 19 after the tool has been engaged with a wire to be bent or during the process of bending a wire.

The modified tool shown in FIG. 5 is well adapted to be made in larger sizes for heavier use. In this tool the wire engaging parts indicated by primed numerals 12'13'14'15'16' and 17' are the same as the corresponding parts indicated by similar non-primed numerals in FIGS. 1, 2 and 3 and they operate in the same manner in bending a wire. However the connection of

certain lever arms with the outer end portion of a shaft 31 which corresponds to shaft 11 and with the outer end portion of a frame tube 30 which corresponds to frame tube 10 differ as hereinafter explained. The outer end of the frame tube 30 has, preferably three, internally threaded coupling members 32, only two of which are shown, welded or otherwise rigidly secured to it and protruding radially from it, preferably at intervals of about 90°. An interchangeable lever arm 33 is provided for selective use in any one of said coupling members 32. The shaft 31 extends beyond the outer end of the frame tube 30 and has a rigidly attached non-adjustable lever arm composed of a coupling member 34 and arm member 35 secured to it.

Either of the previously described tools can be readily applied to the wires which extend into an ordinary meter base or electrical receptacle and used to bend these wires to the shape desired. The provision for adjusting the lever arms relative to each other makes it possible to position said lever arms so they can be used to the best advantage in applying the bending force and also facilitates use of the tool under conditions where the operating space for the lever arms is limited or obstructed.

I claim:

1. A wire bending tool comprising a frame tube; a shaft rotatable in and extending through said frame tube; two lever arms connected respectively with the outer end portions of said frame tube and said shaft and extending outwardly therefrom; a pin carrying member extending crosswise of and rigidly attached to the inner end portion of said shaft; two spaced apart wire bending pins rigid with and protruding from said pin carrying member at opposite sides of the common axis of said shaft and frame tube; a pin carrying arm rigid with and extending transversely from the inner end portion of said frame tube adjacent to said pin carrying member; and a third wire engaging pin rigid with and protruding from said pin carrying arm at a greater radial distance from said common axis than said two first mentioned pins, said third pin being movable in a circular path outwardly from and around the path of movement of said two first mentioned pins and being positionable to engage a wire passing between said two first mentioned pins.

2. The wire bending tool as claimed in claim 1 in which a sleeve of thin material is rotatively disposed on each of said wire bending pins.

3. The wire bending tool as claimed in claim 1 in which adjustable connecting means connects the inner end of one of said lever arms with a rotatively movable part of the tool, thereby providing selective angular positioning of said lever arms relative to each other.

4. The wire bending tool as claimed in claim 1 in which adjustable connecting means is provided between the outer end portion of said shaft and one of said lever arms, thereby providing selective angular adjustment between the two lever arms when the tool is engaged with a wire to be bent.

5. A wire bending tool comprising a pair of spaced apart, generally parallel, wire engaging pin members; first rotation means for rotating said pair of pin members about an axis of rotation extending between and generally parallel to said pair of pin members; a third wire engaging pin member extending generally parallel

to said axis at a greater distance therefrom than either of said pair of pin members; and second rotation means for rotating said third pin member along a circular path, which path encircles said pair of pin members.

6. The tool of claim 5 wherein said pair of pin members and said third pin member have a common axis of rotation.

7. The tool of claim 5, wherein said first rotation means comprises a first shaft extending along said axis and rigidly connected to said pair of pin members; and wherein said second rotation means comprises a second shaft rigidly connected to said third pin member and extending parallel thereto.

8. The tool of claim 7 wherein said first rotation means further comprises a first lever arm secured to said first shaft; and wherein said second rotation means further comprises a second lever arm connected to said second shaft.

9. The tool of claim 8 further comprising means adjustably interconnecting one of said lever arms to one of said shafts for providing selective angular adjustment between said first and second lever arms.

10. The tool of claim 7 wherein said second shaft is in the form of a tube and said first shaft extends through said second shaft.

11. The tool of claim 5 wherein the axis of rotation of said third pin member is located within the path of rotation of at least one of said pair of pin members.

12. The tool of claim 17 wherein said first rotation means comprises a first shaft extending along said axis and rigidly connected to said pair of pin members; and wherein said second rotation means comprises a second shaft rigidly connected to said third pin member and extending parallel thereto.

13. The tool of claim 12 wherein said first rotation means further comprises a first lever arm secured to said first shaft; and wherein said second rotation means further comprises a second lever arm connected to said second shaft.

14. The tool of claim 13 further comprising means adjustably interconnecting one of said lever arms to one of said shafts for providing selective angular adjustment between said first and second lever arms.

15. The tool of claim 5 wherein said third pin member is continuously rotatable around said circular path.

16. The tool of claim 15 wherein said pair of pin members and said third pin member have a common axis of rotation.

17. The tool of claim 15 wherein said first rotation means comprises a first shaft extending along said axis and rigidly connected to said pair of pin members; and wherein said second rotation means comprises a second shaft rigidly connected to said third pin member and extending parallel thereto.

18. The tool of claim 17 wherein said first rotation means further comprises a first lever arm secured to said first shaft; and wherein said second rotation means further comprises a second lever arm connected to said second shaft.

19. The tool of claim 18 further comprising means adjustably interconnecting one of said lever arms to one of said shafts for providing selective angular adjustment between said first and second lever arms.

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