

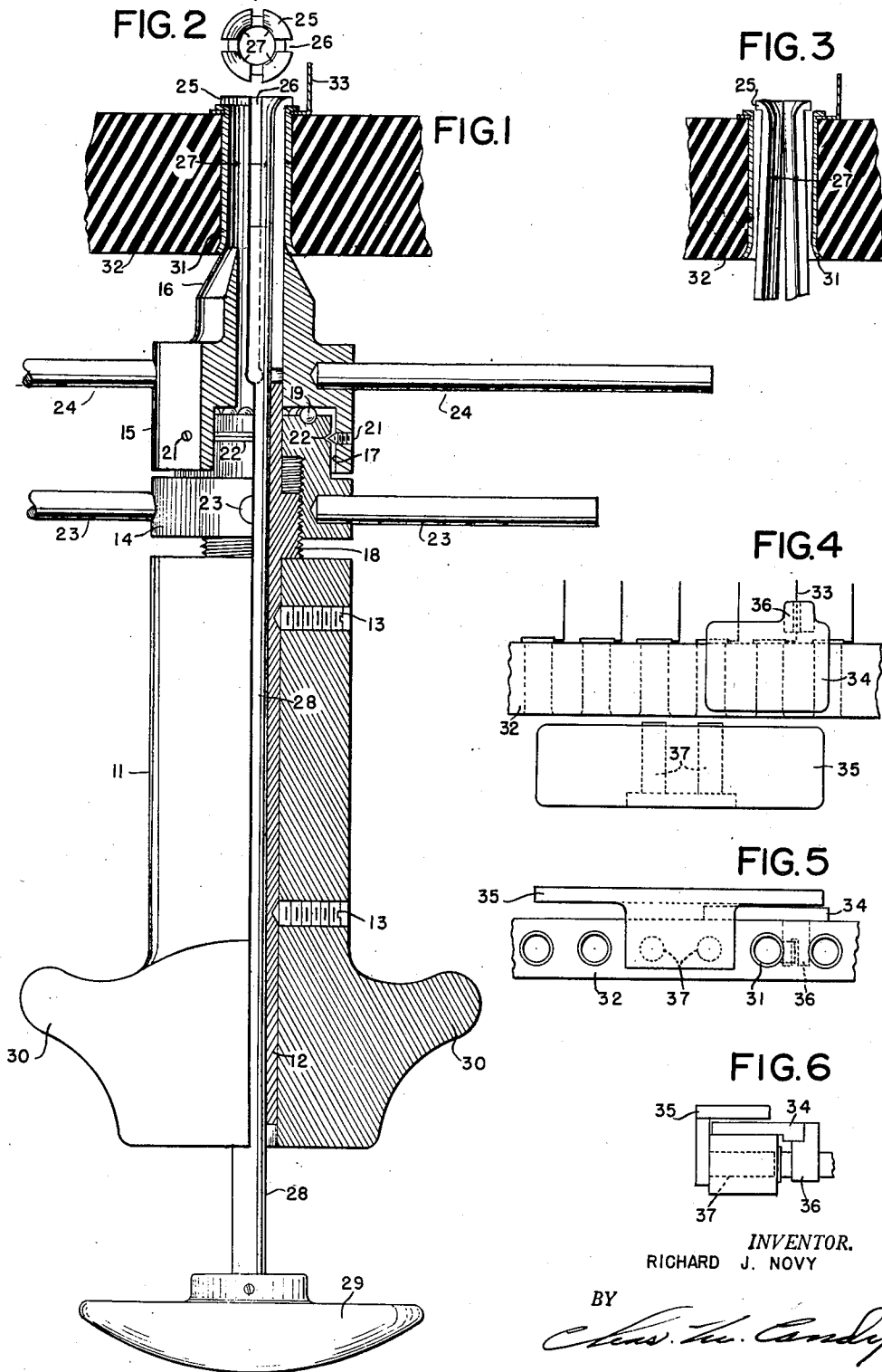
March 21, 1950

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2,501,576

TOOL FOR SPINNING OVER ENDS OF TUBULAR RIVETS

Filed Oct. 3, 1945



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2,501,576

TOOL FOR SPINNING OVER ENDS OF
TUBULAR RIVETS

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Application October 3, 1945, Serial No. 620,149

3 Claims. (Cl. 218—19)

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This invention relates in general to tools and the use thereof, and more particularly to manual tools for respinning switchboard jack thimbles or the like.

Telephone switchboards of the kind employed to facilitate the manual interconnection of calling and called telephone subscribers' lines are commonly made up of strips of jacks assembled in a manner similar to that disclosed in Patent No. 1,842,610, granted January 26, 1932, to H. H. Ide. This assembly forms a substantially continuous panel wherein the jacks are compactly and conveniently arranged so that an operator may, by inserting a plug in any selected jack, complete a connection with the subscriber's line which is permanently wired to that jack.

The opening through which the plug is inserted is lined with a metallic sleeve or thimble and the electrical contact established between the plug and this thimble performs certain circuit functions well known in the telephone art, but which form no part of the present invention. A thimble spring is rigidly connected to the rear side of each thimble to facilitate wiring the thimble to the appropriate circuits.

The individual jack thimbles normally fit tightly in their respective holes or sockets in the associated jack strip, which is formed of hard rubber or other suitable insulating material. Sometimes, however, the thimble may become loose in its hole as a result of a slight change in the size of the surrounding insulator due to atmospheric conditions or as a result of the jarring which the thimble has received in the course of many insertions and removals of switchboard plugs. In the past whenever a thimble has become loose, it has been necessary to unsolder the wires connected to all jacks in the strip containing a loose thimble, then to remove the strip from the switchboard, insert a new strip and resolder the wires to the various jacks in the new strip.

Obviously, this mode of replacement is time-consuming and expensive, and it is the general object of the present invention to accomplish the same result in a more economical and advantageous manner. More specifically, the object of the present invention is to provide an arrangement for tightening loose jack thimbles in any existing strip of jacks without removing the strip from the switchboard and without disconnecting any of the wires soldered to the individual jacks in that strip.

A feature of the invention resides in the provision of a novel arrangement for re-spinning

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loose jack thimbles while in place in a switchboard, whereby the front end of any thimble (i. e., the end through which the plug enters the jack) may be flared outwardly into firm and binding engagement with the adjacent insulating material of the jack strip.

In performing a spinning operation such as this, it is necessary to apply a spinning force to one end of the thimble and to buck this force by an opposing force applied to the other end of the thimble. Since the two ends are separated by an intervening panel of large size, the difficulty of accomplishing this may readily be perceived. Conceivably it might be done by two men working on opposite sides of the panel, one applying the spinning force and the other applying the bucking force; actually, however, according to the present invention, one man working from the front of the switchboard can easily and quickly re-spin a loose jack thimble without any assistance whatever from the rear of the switchboard. It thus becomes unnecessary under normal circumstances even to uncover the rear side of the switchboard, much less to penetrate the maze of wiring which frequently hides the rear of the jacks and their associated thimbles.

These things are made possible by the provision of a new tool which forms the basic part of the invention. Compact in size and very simple to operate, this tool has an element which may be inserted through any jack opening to apply a bucking force to the rear of the associated jack thimble while the thimble is being spun.

Another feature of the invention resides in the provision and use of auxiliary tools or jigs to prevent the jack thimble from rotating in its socket while being spun.

Other objects and features of the invention will be made clear in the following description thereof taken in conjunction with the drawings, wherein

Fig. 1 is a view partly in elevation and partly in longitudinal cross section showing the manual spinning tool in operative relationship with a switchboard jack thimble,

Fig. 2 is an end view of the spinning tool,

Fig. 3 is a view illustrating how the spinning tool may be inserted into a jack, and

Figs. 4, 5 and 6 are top, front and side elevational views, respectively, of the auxiliary tools provided to prevent the thimble from turning in its socket while being spun. (Figs. 5 and 6 show the auxiliary tools in operative relationship to a jack strip, while Fig. 4 shows one of these.

tools displaced slightly from the jack strip for the sake of clarity.)

Referring first to Fig. 1, the spinning tool comprises a handle 11 having a central opening therethrough for receiving the shank portion of an elongated tubular member 12 which is rigidly secured to the handle by means of set screws 13. The tubular member extends outwardly from the handle for a short distance and carries on this extension two independently rotatable elements 14 and 15. The latter of these comprises a spinner; it has a tapered nose portion 16 shaped generally like a truncated cone and, at the other end, has a recess 17 into which fits a reduced portion of the rotary element 14.

Element 14 forms a thrust member whose interior is threaded to cooperate with an enlarged threaded portion 18 on the tube 12 so that the member advances along the tube as it is rotated. The thrust is taken by ball bearings 19 situated in a suitable race in the thrust member, and retaining screws 21 in the spinner cooperate with a groove 22 in the thrust member so that the two cannot be separated far enough to permit the balls to leave the race. Four radial spokes or handles 23 disposed at right angles to one another are provided in the thrust member for rotating same, similar handles 24 being provided for rotating the spinner 15.

The extreme end of the tubular member 12 is flared outwardly to form a narrow flange or lip 25. Four narrow slots 26 extending longitudinally down the tube from its end divide the tube into four segments 27 each of which is independently supported at its base end. These segments are tensioned toward the axis of the tube so that they tend to occupy the positions shown in Fig. 3. They are normally prevented from doing so, however, by an elongated cylindrical rod 28 which is provided at one end with a knob 29 to facilitate moving the rod axially in the tube 12.

The use of the tool now will be described briefly, it being assumed for purposes of explanation that the jack thimble 31 (Fig. 1) has become loose in its hole in the associated jack strip 32. Knob 29 first is pulled away from handle 11 until the upper end of rod 28 occupies a position below the slotted portion of tube 12. The slotted portion of the tube thereupon assumes the shape illustrated in Fig. 3 due to the tension of the individual segments 27, and the contracted condition thereof permits the end of tube 12 to be inserted in the jack opening from the front of the jack strip and moved back until lip or flange 25 extends beyond the rear edge of the thimble. Then the rod 28 is thrust back in the tube by advancing knob 29 until it strikes the base of handle 11. This spreads the segments apart, causing the lip 25 to hook behind the inner end of the thimble so that tube 12 now can not be pulled back out of the opening.

Next, by means of the radial spokes or handles 23, the thrust member 14 is manually rotated until the tapered nose of the spinner 15 engages the flared opening of the thimble 31. (Preferably the nose of the spinner is provided with slightly raised longitudinal ribs which engage the thimble at spaced-apart points around the opening thereof.) The thrust member thereafter is advanced slowly by further rotation thereof, spinner 15 meanwhile being manually rotated by means of the spokes or handles 24. As the rotating spinner advances, it gradually spreads the opening of the thimble while at the

same time lip 25 acts as a bucking member by applying to the rear edge of the thimble a force which tends to pull it tight against the back side of the jack strip 32. Thus is the material of the thimble spun or flared outwardly around the mouth of the opening so that it tightly grips the material of the jack strip which surrounds the thimble.

To remove the tool, the thrust member is rotated slightly in a reverse direction to withdraw the nose of the spinner, and then knob 29 is again pulled away from handle 11 until the upper end of rod 28 is below the slotted portion of tube 12. The slotted portion of the tube thereupon once more assumes the shape shown in Fig. 3 permitting it to be withdrawn from the thimble. To facilitate removal of the tool, the handle 11 is provided with a pair of laterally extending wings 30 about which the operator may hook the fingers of one hand.

In re-spinning jack thimbles which have become very loose, the rotation of the spinner 15 may tend to turn the thimble itself and hence twist the thimble spring 33 which is securely fastened thereto. This tendency may be reduced by applying a lubricant to the nose 16 of the spinner where it engages the jack thimble, but in severe cases it is desirable to make use of an auxiliary jig as shown in Figs. 4, 5 and 6.

This is made up of two members 34 and 35, the first of which has a generally rectangular main body with a single slotted pin 36 projecting therefrom at right angles. The second member has a somewhat longer rectangular body, from one longitudinal edge of which a flat stem portion projects at right angles; carried by this stem portion so that their axes are parallel to the main rectangular body of member 35 are two pins 37 of such size and spacing as to fit into two adjacent jacks in a jack strip.

To use these auxiliary tools it is necessary to have access to the top edge of the jack strip containing the loose thimble. This may be obtained by removing the strip from the switchboard in the manner explained in the above-mentioned patent to Ide, and working on it (with the wiring still attached thereto) on the rear side of the switchboard. Alternatively, the strip containing the loose thimble may be left in place in the switchboard while the strip adjacent thereto is pushed back far enough to expose the upper surface of the first-mentioned jack strip.

In either case the member 34 is placed flat upon the upper surface of the jack strip containing the loose thimble so that the slotted pin 36 extends downwardly over the thimble spring attached to said thimble. Then the pins 37 on member 35 are pushed into the first and second jacks adjacent the jack whose thimble is to be tightened. When this is done, the upper surface of member 35 slides over the main body of member 34 locking the same to the jack strip, and the two members thus hold the thimble spring 33 in a vertical position resisting any tendency of the spinning tool to twist the spring by rotating the associated thimble during the re-spinning thereof.

While I have described my invention in its preferred form, it will be understood that various modifications may be made in the structure of the tools, the manner in which they are manipulated and the use to which they are put without departing from the true spirit and scope of the invention; what I believe to be new and desire to

have protected by Letters Patent is set forth in the appended claims.

What is claimed is:

1. In a tool for spinning over the near end of a tubular sleeve, an elongated tubular member having a hollow center extending through its entire length, longitudinally extending slots in the front end of said tubular member forming a plurality of elongated segments, flanges formed on the free ends of said segments and extending away from the axis of said tubular member; a push rod slidably mounted within said hollow center of said tubular member and depressible, after insertion of said segments and flanges through the sleeve, for spreading said segments and flanges away from the axis of said tubular member to lock said flanges outside the far end of the sleeve and prevent withdrawal of said segments from the sleeve; a thrust member mounted for rotation on said tubular member, a spinner, coupling means for longitudinally retaining and rotatably coupling said thrust member to said spinner in close coupled relation, means including a threaded portion of said tubular member cooperating with a threaded portion of said thrust member for simultaneously advancing both said thrust member and its coupled spinner toward said front end of said tubular member to clamp the sleeve between said flanges and said spinner in response to the rotation of said thrust member, means for rotating said spinner, and a cone-shaped surface on said spinner for spinning over the near end of the clamped sleeve in response to the rotation of said spinner.

2. In a tool as claimed in claim 1 including a depression in said spinner, an extension of said thrust member fitting into said depression, a race in the bottom of said extension of the thrust member, ball bearings in said depression and in said race providing antifricition means between said spinner and said thrust member, and wherein said coupling means comprises retaining screws in the wall of said depression and a circular groove in said extension cooperating with said retaining screws for retaining said spinner longitudinally coupled to said thrust member.

3. In a tool for spinning over the near end of a tubular sleeve, an elongated member having an extension insertable into the sleeve, outturned flanges on the far end of said extension, means for spreading the outturned flanges on the far end of the extension to engage over the far end of the sleeve and lock the member against withdrawal from the sleeve, a spinner having a cone-shaped surface, a thrust member on which said spinner is mounted, said thrust member being mounted for rotation on said elongated member, coupling means for always retaining said thrust member and said spinner in close coupled relation, the means mounting said thrust member rotatably on said elongated member including a threaded portion of said elongated member cooperating with a threaded portion of said thrust member for providing said rotation of said thrust member to advance said spinner toward the far end of the elongated member to clamp the sleeve between the outturned flanges on the far end of the elongated member and the spinner with the cone-shaped surface of the spinner against the near end of the sleeve, and means for rotating the spinner independently of said thrust member to spin over the near end of the sleeve.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,323,052	Haselhurst	Nov. 25, 1919
1,744,878	Gabel	Jan. 28, 1930
1,775,898	Fleming	Sept. 16, 1930
1,789,080	Neldner	Jan. 13, 1931
1,809,154	Becker	June 9, 1931
1,840,103	Junkers	Jan. 5, 1932
1,846,116	Kerns	Feb. 23, 1932
2,146,461	Bettington	Feb. 7, 1939
2,367,265	Cooper et al.	Jan. 16, 1945
2,380,068	Patton	July 10, 1945