Aug. 2, 1966 M. J. COX ETAL 3,263,958

TIE FOR CONCRETE FORMS

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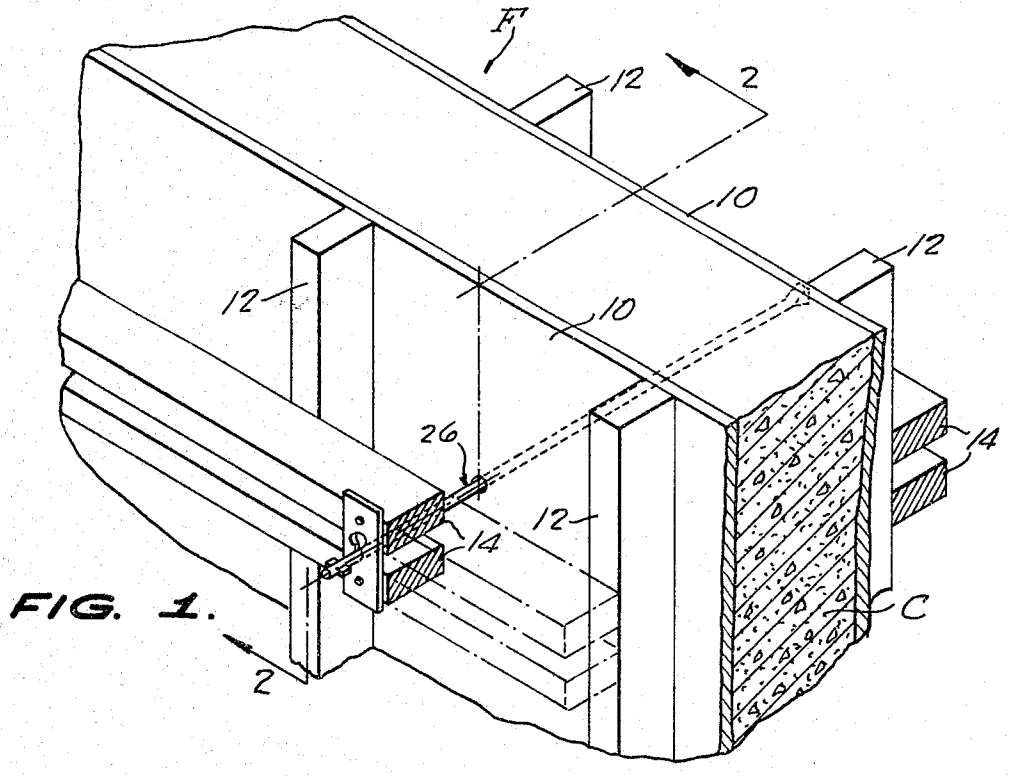
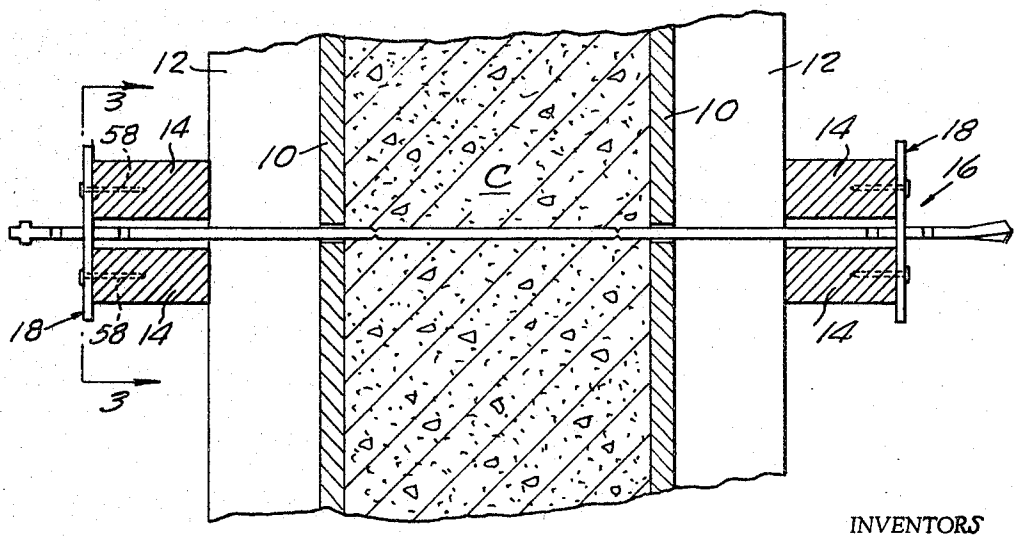


FIG. 1.

FIG. 2.



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FIG. 3.

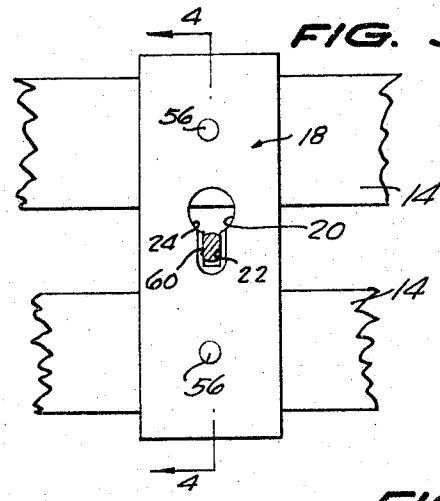


FIG. 4.

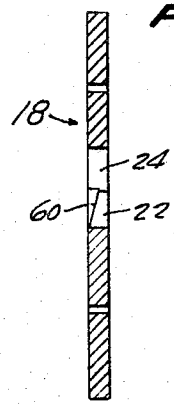


FIG. 5.

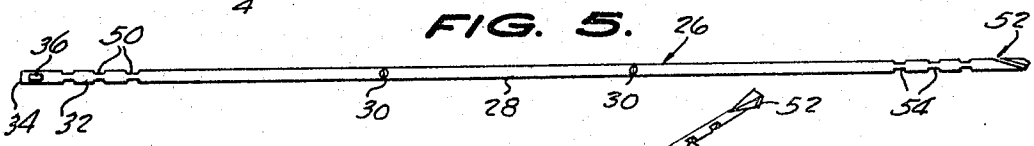


FIG. 6.

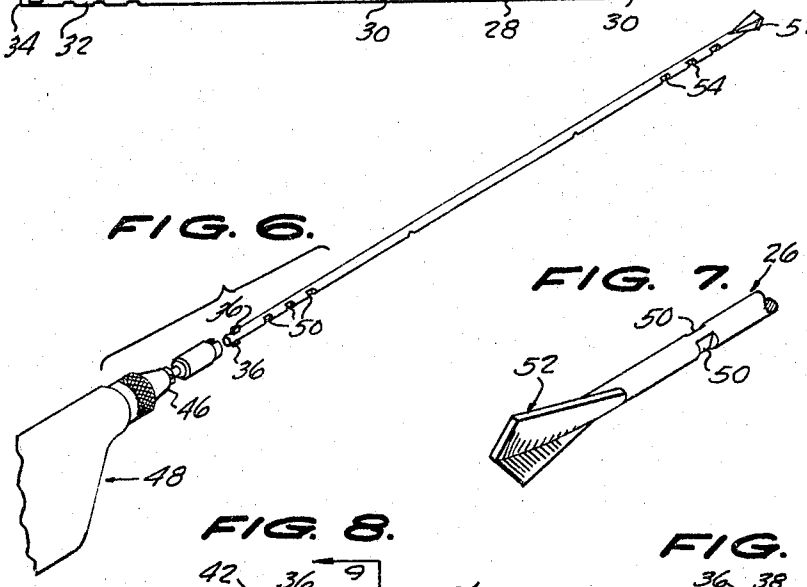


FIG. 7.

FIG. 8.

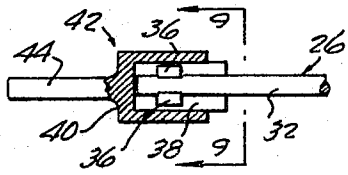
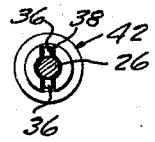


FIG. 9.



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United States Patent Office 3,263,958 Patented August 2, 1966

3,263,958

TIE FOR CONCRETE FORMS

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Filed Sept. 18, 1964, Ser. No. 397,466
1 Claim. (Cl. 249—213)

This invention relates to a tie for concrete forms, and more particularly to a boring bit type of tie assembly.

The primary object of the invention is the provision of an assembly of this kind which is adapted to be quickly, easily, and accurately drilled, by means of an electric drill, through the panels of concrete forms, of different widths, whereby very substantial savings in time and in labor are achieved over present methods.

Another object of the invention is the provision of an assembly of the character indicated above, comprising a tie rod, having on one end a boring bit, and, on its other end, a drill chuck engaging member, the rod being formed, at intervals with opposed break-off notches, the boring bit end of the tie being formed, at its ends, with means facilitating withdrawal of the tie rod, from a concrete form, by means of a suitable tool.

A further object of the invention is the provision of an assembly of the character indicated above, which further comprises key-plates, adapted to engage parts of a concrete form, and having keyhole openings through which the drill chuck end and the boring bit end of the tie rod are adapted to engage, the tie rod being larger in diameter than the slots of the keyhole openings of the plates and smaller in diameter than the round holes of these openings, the rod being formed adjacent its ends, with opposed squared notches adapted to lockingly wedge in the slots of the key-plates.

In the drawings:

FIGURE 1 is a fragmentary perspective view of a filled concrete form, parts being broken away and in section, showing an assembly of the present invention installed;

FIGURE 2 is an enlarged vertical transverse section taken on the line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged fragmentary vertical longitudinal section taken on the line 3—3 of FIGURE 2;

FIGURE 4 is a vertical transverse section taken on the line 4—4 of FIGURE 3;

FIGURE 5 is a side elevation of the rod;

FIGURE 6 is a fragmentary perspective view, on a reduced scale, showing the tie rod about to be engaged in the chuck of an electric drill;

FIGURE 7 is an enlarged fragmentary perspective view of the boring bit end of the tie rod;

FIGURE 8 is a side elevation, partly broken away and in section, showing the chuck end of the tie rod engaged in a special electric drill chuck; and

FIGURE 9 is a transverse section taken on the line 9—9 of FIGURE 8.

Referring in detail to the drawings, a concrete form F is shown, which comprises a pair of perpendicular laterally spaced panels **10**, of such as plywood, against the outer sides of which longitudinal spaced perpendicular studs **12** bear. Vertically and closely and parallel spaced pairs of wales **14** bear against the outer edges of the studs **12**, below the upper ends of the studs. A poured filling of concrete C is between the panels **10**.

An assembly of the invention, generally designated **16**, comprises a pair of similar key-plates **18**, adapted to bear against and span the wales **14**, at selected intervals therealong. The key-plates **18** are of vertically elongated rectangular shape and are at least as tall as the combined thicknesses and the spaces between the wales **14**. The

key-plates are centrally formed with vertically elongated keyhole openings **20**, comprising vertical slots **22** narrower than a tie rod, which open diametrically to the undersides of relatively large diameter round holes **24**.

The assembly **16** further comprises, for each pair of key-plates **18**, a single straight tie rod **26**, which is longer than the thickness of the concrete form F. The rod **26** has a main central portion **28**, which is smooth, except for two or more weakened areas, defined by opposed V-shaped notches **30**.

The main portion **28** of the tie rod merges into a chuck end portion **32**, which is formed, adjacent to the tie rod end **34**, with a pair of diametrically opposed flat rectangular wings **36**. The wings **36**, as shown in FIGURES 6, 8 and 9, are adapted to be non-rotatably secured in a longitudinal slot **38**, formed in the head **40** of a drill chuck **42**, having a shank **44** adapted to be secured in the chuck **46** of an electric drill **48**. This special chuck arrangement, in conjunction with the wings **36**, enables merely pulling the drill off the tie rod, when the drilling has been completed, instead of taking the time to release the tie rod from a conventional drill chuck.

Near to but spaced inwardly from the wings **36**, the tie rod is formed with a row of equally longitudinally spaced, opposed squared notches **50**, which are adapted to accommodate a suitable tool (not shown) for withdrawing the tie rod **26**, from the concrete form F.

The tie rod **26** terminates, at its other end, in a double-way boring bit **52**, which is larger in diameter than the tie rod. A row of tool accommodating square notches **54**, similar to the notches **50**, is formed in the rod adjacent to and inwardly of the bit **52**.

In use and operation, a key-plate **18**, which is formed with nail holes **56**, above and below the key-hole openings **20**, is nailed, as indicated at **58**, through the holes **56**, to the outer edges of the wales **14**, at the approach side of the form F. As shown in FIGURES 3 and 4, the outer sides of the key-plates **18** are cut away to define upwardly and inwardly angled wedges **60**, along the sides of the slots **22** of the keyhole openings **20**, so that, when a pair of squared notches **50** or **54** are pressed downwardly from the holes **24** of the keyhole openings **20**, into the slots **22**, the related ends of the tie rod are wedgingly locked to the key-plate **18**.

The bit end of the tie rod **26** is then passed through the circular hole **24** of the key-plate **18**, at the approach side of the concrete form F, until the bit end engages the adjacent form panel **10**. The chuck end of the tie rod **26** is then engaged in the special drill chuck **42** and drilling begun by actuating the electric drill **48** and exerting forward pressure.

When the drill bit **52** shows through the remote form panel **10**, the other key-plate **18** is installed, like the first-mentioned key-plate, on the wales **14**, with its keyhole opening **20** lined up with the bit end of the tie rod. As the bit end of the tie rod clears the second form panel **10**, and enters the hole **24** of the key-plate, further pull on the tie rod can be applied, by means of a suitable tool (not shown) applied to the adjacent squared notches **54**, so as to properly position the tie rod **26** relative to the form F. Related squared notches **50**, **54**, at both ends of the tie rod, are then depressed into the keyhole slots **22**, so as to wedgingly lock the tie rod in place, relative to the form F.

If desired, the tie rod **26** may be left, in entirety, in place of the form F, or it may be entirely withdrawn therefrom, through the holes **24** of the key-plates **18**; or only the middle portion of the tie rod, can be left in place in the concrete. The last situation is accomplished by exerting pull on one end of the tie rod **26**, by means already indicated, while the other end of the tie rod is locked, by means of a squared notch **50**, **54** being en-

gaged in the slot **22** of the related key-plate **18**; or by similarly exerting pull on both ends of the tie rod, with the ends thereof positioned in the holes **24** of the key-hole openings **20** of both key-plates **18**.

It has been found, in on-site practice, that tie rod **26** can be installed substantially more easily and quickly than presently available tie rods, and that tie rods **26** can be removed with similar ease and dispatch.

What is claimed is:

A concrete form tie comprising a round rod having a substantially straight middle portion of uniform cross-section, one end portion of said rod being formed with engager means adapted for operative engagement with the chuck of an electric drill, the other end of said rod terminating in a drill bit larger in diameter than said middle portion, said engager means comprising a pair of diametrically-opposed wings and a chuck having a shank adapted

to be engageable in the chuck of an electric drill, said rod being formed adjacent to said engager and adjacent to the boring drill bit with rows of spaced pairs of opposed squared notches adapted to be lockingly engaged with retaining means on opposite sides of a concrete form.

References Cited by the Examiner

UNITED STATES PATENTS

1,108,888	9/1914	Cousins	249—40
1,712,876	5/1929	Dolezal	145—116
2,358,077	9/1944	Koett	145—116
2,778,087	1/1957	Krueper	249—213
3,057,034	10/1962	Helmick	249—213

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