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SNAP TIE FOR CONCRETE FORMS

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Fig. 1.

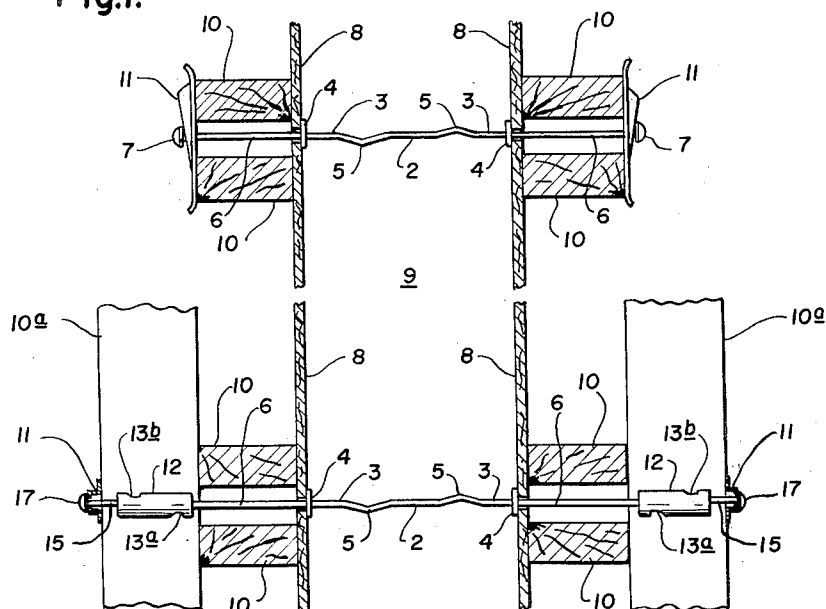


Fig. 2.

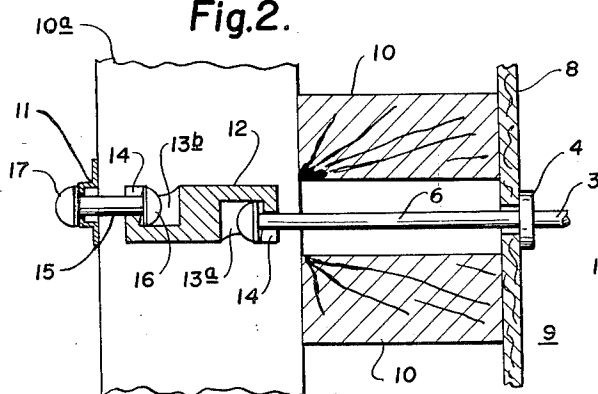


Fig. 3.

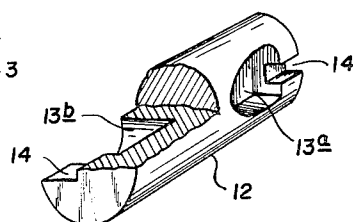
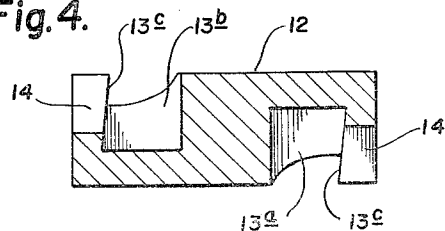


Fig. 4.



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1

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SNAP TIE FOR CONCRETE FORMS

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2 Claims. (Cl. 25—131)

This invention relates to concrete forms, and is for a snap tie.

Concrete forms used in concrete wall construction work are generally made up of sections, each section being comprised of panels, these often being made of plywood. The panel is reinforced on its outer face by studs at intervals along the section, generally being formed of dimension lumber, as for example two-by-fours, and there may be other braces or wales extending across the studs. The forms are arranged in confronting spaced relation and the concrete is poured into the space between the forms.

One or both surfaces of the concrete are generally exposed in the finished job, so that the forms must be properly spaced and lined up and then held from spreading against the hydrostatic pressure of the wet concrete that is subsequently poured between the forms. To assure this alinement, metal rods, commonly known in the industry as snap ties, are put in place at intervals connecting the confronting forms and holding them in spaced relation. These snap ties have a main intermediate portion with some deformation or attachment to hold the tie against rotation in the concrete which eventually hardens about it. At the ends of the intermediate portion are secured disks or washers that bear against the inner faces of the forms, keeping the forms uniformly spaced from each other. They are usually placed in the forms at the levels between successive horizontal panels. The studs are usually arranged in closely spaced pairs, and the wales extending across the studs are likewise arranged in pairs. It was formerly common practice to locate the snap rods so that their ends would extend between the studs and the wales. The ends of the tie rods have buttons thereon and wedges, placed over these buttons, were driven down between the buttons and the wales to place the rods under tension. If it was necessary to use tie rods where they did not come between the studs and wales, extra lumber was added to the exterior of the forms against which the wedges would bear. This required much additional lumber as well as labor, and more recently long and short snap ties have come into use, the longer ones extending through to the exterior of the wales, and the shorter ones being of a length where the wedges might bear against the studs. It may be explained that after the concrete has set and the wedges are removed, the forms are taken down and the projecting ends of the snap ties are twisted off.

While the use of long and short ties has eliminated much waste of lumber, it has imposed on the contractor the need for estimating in advance how many ties of each length he will require, and since there may be many thousands on a single job, this entails considerable estimating, or the risk of being embarrassed by a shortage of one size or the other. Also, it frequently happens that a section of a form needs to be braced by adding wales after the ties are all in place, and there is no way of lengthening the ties to accept additional bracing, so that the added bracing cannot be used to the best advantage.

The present invention has for its object to provide a composite snap tie so that it enables a short length tie to be used throughout the form and a length added in any location where a long tie is needed by means of

2

an extension that is re-useable so that the extensions can be transferred from job to job. Moreover, it enables a tie to be extended at any time in any location if bracing has to be added.

These and other objects and advantages are secured with my invention which may be more fully understood in connection with the accompanying drawings, in which:

FIG. 1 is a vertical section through a form showing two ties, one with and one without the extension;

FIG. 2 is a fragmentary enlarged view of a portion of FIG. 1 with the connector shown in longitudinal section;

FIG. 3 is a perspective view, partly in section, of the connector; and

FIG. 4 is a longitudinal vertical section through the connector.

Referring to FIG. 1, 2 designates a conventional short length tie formed of a rod and having a main intermediate reach 3 with a washer 4 defining each end limit thereof, and with some means 5 spaced just inwardly from the washers to hold the rod from turning when the concrete sets around the tie. The washers 4 are fast on the rod, and the rod has an extension 6 beyond each washer with its end upset to form a button 7.

In FIG. 1, 8 designates several panel sections forming opposite sections of a form. They are here shown as being comprised of plywood, but they can be formed of metal, sheathing, or any suitable material. The panel sections are customarily two feet or less in width, and usually several feet long. The ties are laid with one end on the top edge of one section with the washer bearing against the inner face of the form, its opposite end being similarly positioned on the top edge of a section of a confronting similar panel, the main section 3 of the tie spanning the space 9 between the two forms. The ties are spaced at intervals along the sections and then a succeeding section is put in position, thereby confining the ties between the edges of the two sections.

Bracing members 10 are secured to the exterior of the sections. This bracing is formed of dimension lumber (2" x 4", 2" x 6", etc.) and it runs either vertical or horizontal. These braces are known as studs, and the studs are located in closely spaced pairs at the locations where snap ties are placed, with the ends of the snap ties extending between them, and are long enough so that the button at each end is spaced about three-eighths of an inch beyond the outer face of the studs. A slotted wedge 11, called in the trade a "hair-pin," is placed over the end of the tie and driven down between the button and the stud to put the tie under tension and line up the forms.

The wales 10a run crosswise of the studs, and are here shown as being vertical. They are arranged in pairs, the two boards of each pair being spaced about an inch apart, and they, too, are generally of dimension lumber. Instead of using a longer tie, as is the present practice, the present invention provides a composite tie, or extension for the short tie. This extension comprises a connector 12, preferably a malleable casting or forging having a recess 13a near one end and a similar recess 13b at the other. The two recesses or sockets are preferably located 180° from each other, so that when one faces up, the other opens downward. There is an axially-extending groove or notch 14 extending from the end of the connector to the nearest socket or recess. The distance from the end of the connector to the recess is a little less than 3/4", and the thickness or diameter of the connector is such that it can be inserted in the space between the wales and the notch at the inner end placed over the protruding button on the tie, the rod fitting into the groove. The connector so

3

formed has a bifurcated end wall at each end with a socket at the rear of the end wall. The inner or rear face 13c of the end wall is reversely sloped or undercut to a slight extent, as shown in FIG. 4.

There is provided a tie extension 15 having a button 16 at one end, and a similar button 17 at the other. The length of the extension along with the length of the connector is such that when the button 16 is hooked into the recess at the other end of the connector 12, the button 17 will be about $\frac{3}{8}$ " from the front of the wales so that a wedge or hair-pin can be slipped over the button and driven down, putting the composite tie comprising the main tie, the connector and the extension under tension. In this way the composite tie rod takes the place of the single long one heretofore required in this location. The tie can be extended at one or both ends, since, in some cases, the concrete wall may be placed in an excavation and the forms at only one face are lined up, as one face of the finished wall is never exposed, and therefore the added bracing is not required at both faces. On exposed concrete, an extension is usually used on both ends.

I have found that by having the recess 13a opening down the connector will be held in position by gravity on the snap tie until the end of the extension is inserted in the upwardly-turned recess 13b, which in turn will be held by gravity until the hair-pin or wedge is put into place. The connector is here shown as being circular in cross section, but it may be shaped in various ways. By having the face 13c of the bifurcated end of the connector undercut, any vibration tends to cause the buttons of the snap tie and extension to move radially inward and keep them more firmly in place. When the form is taken down, the connectors 12 and the extension pieces 15 may be removed and collected for re-use.

The invention saves the estimator for the construction job much work in preparing for the job because he can order one length of ties; it saves metal and labor, and makes it possible to change from a short to a long tie at any time after the forms are erected. It also permits rapid and less costly adaption of the panel forms

4

to suit field conditions. For example it may happen that when a form section is removed from one location to a new location on the same job, conditions may require a different length of tie in a given location. The present invention enables the length to be effectively changed by adding or removing an extension.

I claim:

1. A composite snap tie for concrete forms comprising an integral main rod section having a button at each end and a washer spaced inwardly from each button, a separate connector member having an open recess at one end into which the button and end portion at one end of the main section of the tie is removably received, and an extension section having a button at each end thereof, the connector having a similar open recess at its other end into which the button and end portion of the extension are removably received.

2. The combination with a snap tie having an intermediate main portion, a washer on the rod at each end of the main portion, an extension beyond each washer terminating in a button, of a connector comprising an elongated body having a bifurcated end at each end with a similar open recess behind each bifurcated end, the button of the tie rod being removably received in one recess with the bifurcated end straddling the rod back of the button, and an extension comprising a rod having a button at each end, a button at one end of the extension being removably engaged in the other recess with the bifurcated end straddling the rod back of the button.

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