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J. B. HAWLEY, JR

TIE ROD FOR CONCRETE FORMS

Filed Aug. 10, 1927

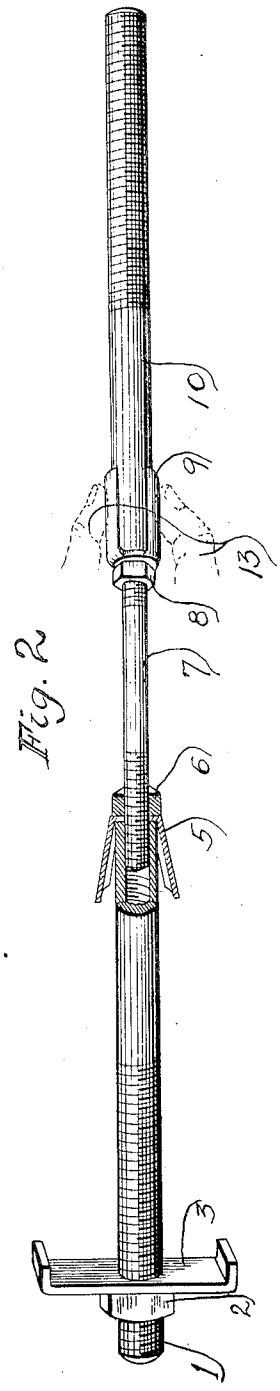


Fig. 2



Fig. 4

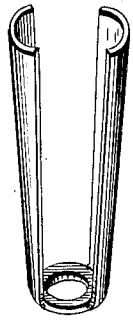


Fig. 3

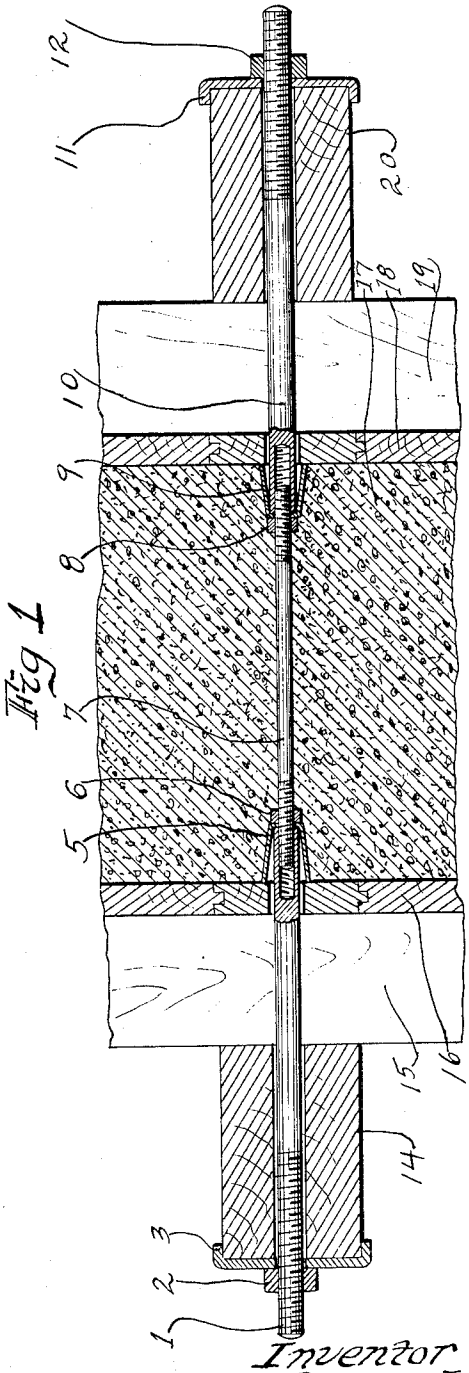


Fig 1

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UNITED STATES PATENT OFFICE.

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TIE ROD FOR CONCRETE FORMS.

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This invention has to do with holding forms for monolithic structures such as wall forms, foundation forms, etc. In previous patent issued me June 1, 1926 and numbered 1,586,991 and entitled The construction of monolithic structures I have described means for holding wall forms in properly spaced relation. This invention has reference to still further improved means for holding concrete forms while at the same time utilizing all of the virtues of the device disclosed in my previous above named patent.

One of the objects of the invention is to use bolts which may be withdrawn after the concrete is set and used over again. This is accomplished by screwing back the bolts utilizing either jam nuts for locking on the threads, squared ends on the bolts, or a jam to back the nut against. This feature makes the most expensive part of the assembly available for use over and over again.

Another object is to provide a structure of such form that it can be used with the ease of a solid rod and inserted from one side of the form to extend through the other side without necessitating guidance from within the form, where steel reinforcing may be placed.

The invention further provides a design where forms will be accurately spaced and held from falling together during the period of construction previous to the filling with concrete.

Another feature provides for a spacing means (which prevents the forms from falling inward) which may be left in the finished wall without marring the external appearance thereof. In order to prevent rusting and consequent streaking of the finished surface it may be well to make the spacing clip of some non-corrosive substance such as copper, brass, zinc, galvanized iron, stainless steel, aluminum, Monel metal, nickel steel, or other rust resisting metal. It may also be desirable to use two or more segmental spring clips for wall spacing and thereby form a closable conical structure which prevents the concrete from entering the frustro-conically shaped center portions formed thereby and then if desired these portions are removable after the concrete has set. This same result could be accomplished by a spring clip having many prongs with openings spaced close together when the clip is in the form entering or collapsed position.

Still another object of the invention is to provide a wall spacing means that may be adjustably centered or spread while in the forms. This is accomplished by an arrangement of the threaded center rod which permits screw adjustment.

Other objects of the invention will appear from the detailed description of the same which consists of the features of construction and combination of parts hereinafter described and claimed.

In the drawings:—

Fig. 1 shows a fragmentary cross section of a concrete form and concrete wall with the tie-bolts, connecting threaded rod, stop nuts, and spacing clip, in place.

Fig. 2 shows the assembled structure ready to be inserted in the wall form.

Fig. 3 shows a detail of the spacing clip.

Fig. 4 shows an ordinary hexagon nut as used for adjustable spacing of the spring clip shown in the other views.

The term "clip" as used herein, is intended to include a yieldable metallic design arranged for either manual or mechanical compression when small diameter is desired.

The term "washer" is intended to include such washers as shown or cut washers or O. G. washers or other means for the distribution of imposed load. The particular one shown in the drawings is similar to structure shown in French patent Number 525,989 which shows a concrete form held by like means.

In the drawings is illustrated the usual concrete form with wood sheeting held in place by vertically spaced uprights and these in turn aligned by means of horizontally extending members usually termed "walings." The rod assembly shown in Fig. 2 is ready to be inserted through the prepared concrete form. The dotted fingers 13 are shown as compressing clip 9 so that it will enter the sheeting boards 16. The stop nut 8 is of a diameter small enough to permit it to enter a hole slightly larger than the diameter of the bolt 10. In some instances it may be desirable to fix nut 6 on clip 5 so as to reduce the number of parts in the assembly or it may be desired to eliminate nuts 6 and 8 entirely by simply threading clips 5 and 9 to fit the center rod threads on member 7. It may further be useful to construct clips 5 and 9 with four prongs instead of two as shown so as to prevent concrete from filling between the prongs.

Further uses of this invention may be the

utilization of wedge action of bolt 1 inside of clip 5 to spread same. This may be accomplished by making inside diameter of closed end of clip 5 slightly smaller in diameter than the diameter of bolt 1 so that when rod 7 with nut 6 is screwed toward bolt 1 spreading of clip 5 is ensured.

While the ends of bolts 1 and 10 are shown as threaded it may be desirable to use a set collar slidably adjustable along the bolts; this construction would obviate the use of nuts 2 and 12. Or it may prove cheaper in some instances to use wing nuts (such as are shown in Fig. 1, Number 18 of United States patent issued H. Watson Aug. 14, 1917 and numbered 1,236,795, and many others) rather than nuts 2 and 12 as here shown.

Fig. 1 shows a concrete form made up of walers 14 and 20 backed by vertical uprights 15 and 19 which are in turn sheeted by boards shown as 16 and 18. Concrete 17 is shown poured in between the wall forms and around the parts of my invention extending into the wall form. Bolts 1 and 10 come in between boards forming walers 14 and 20 and a hole is bored in sheeting 16 so as to allow assembled construction with compressed clips 9 and 5 to enter the space for the concrete 17. Clips 5 and 9 are shown in sprung position which prevents forms from falling inward, as any force tends to push them toward each other and against clips 5 and 9 which in turn butt against nuts 6 and 8 respectively. Nuts 6 and 8 are of course held positioned by threads on rod 7.

Having thus described my invention I do not limit myself to the above construction details except as I may do so in the claims.

What is claimed is:

1. An assembly for holding concrete forms comprising two bolts each having a screw socket on one end and a form stop on the other end, a connecting rod threaded into said socket ends and a spring clip fastened to said connecting rod for holding the forms against collapse.

2. An assembly for holding concrete forms comprising two bolts each having internally threaded ends and form stops on the ends opposite the internally threaded ends, a threaded rod screwed into the ends of the internally threaded bolts thereby connecting them together a contractable clip axially fixed to the threaded connecting rod for holding the forms in spaced relation against collapse.

3. A bolt assembly for holding concrete forms comprising two bolts having each a female threaded end, a male threaded rod connecting the female threaded bolts and being screwed therein, form stops on the female threaded bolts preventing form separation, a diametrically contractable spacing device mounted on the male threaded rod for preventing form collapse.

4. A rod assembly for holding concrete forms comprising two rods socket threaded on their respective ends and having form stops to prevent form separation, an externally threaded connecting rod screwed into the socketed ends of said rods, contractable spacers axially held on the connecting rod and providing means to prevent form collapse.

5. A tie rod for concrete forms made up of outer end and intermediate rod sections, the former having internally threaded inner ends and the latter having externally threaded ends screwed into the internally threaded ends of the outer sections, the outer ends having form engaging elements and the inner ends positioned in the forms by means of contractable spacers.

6. A tie rod, for insertion through prepared concrete forms, made up of outer end and intermediate rod sections, the inner section having externally threaded ends, the outer section having internally threaded ends to engage the threaded ends of the intermediate rod, form stops on the outer rod section preventing form separation and variable diameter form stops at the inside ends of the outer ends sections for preventing form collapse.

7. A tie rod, for insertion through prepared concrete forms, made up of outer end and intermediate rod sections, the inner section having externally threaded ends, the outer section having internally threaded ends to engage the threaded ends of the intermediate rod, form stops on the outer rod section to prevent form separation and variable diameter form stops inside the forms defining inside form spacing.

8. A tie rod, for insertion through prepared concrete forms, made up of outer end and intermediate form sections, the inner section having externally threaded ends, the outer section having internally threaded ends to engage the threaded ends of the intermediate rod, form stops on the outer rod section defining form separation and spring expanding form stops at the inside ends of the outer end sections for preventing form collapse.

9. A method of holding concrete forms consisting of making a rod assembly with means thereon to prevent form collapse and inserting the assembled rod sections as a unit though the wall forms from one side.

In testimony whereof, I affix my signature.

JOHN B. HAWLEY, JR.