Nov. 13, 1945. F. D. PARMENTER 2,388,865

SUPPORT FOR CONCRETE FORMS

Filed Aug. 28, 1943

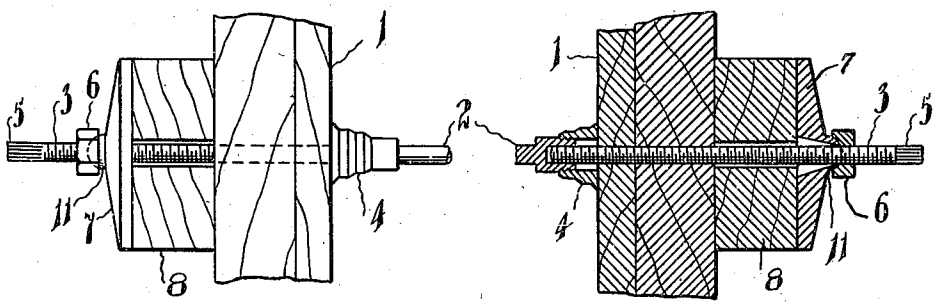


Fig. 1.

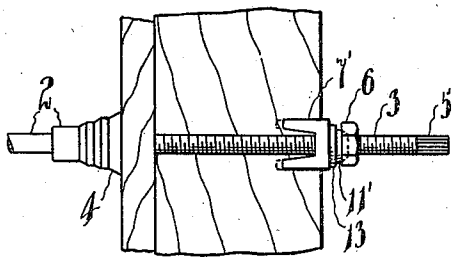


Fig. 2.

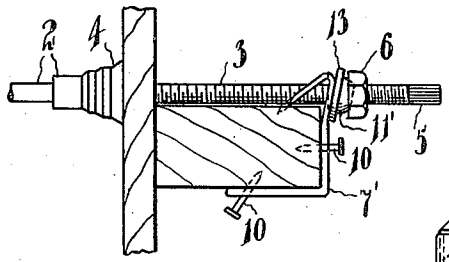


Fig. 3.

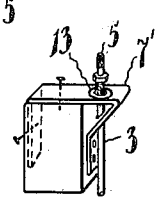


Fig. 3A

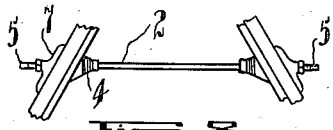


Fig. 8.

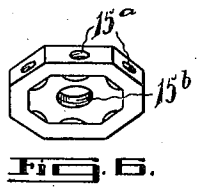


Fig. 6.

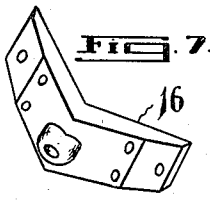


Fig. 7.

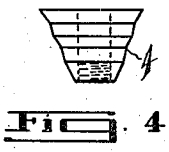


Fig. 4.



Fig. 9.

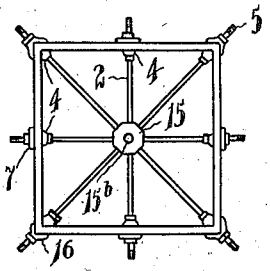


Fig. 5.

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SUPPORT FOR CONCRETE FORMS

Frank D. Parmenter, Toronto, Ontario, Canada

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5 Claims. (Cl. 25—131)

This invention relates to supports for concrete forms. The object of this invention is to improve previously known constructions, particularly the construction shown by prior United States Patent 2,235,442 and others of a similar kind.

Among other difficulties in the use of such supports has been the difficulty of satisfactorily and readily adjusting the length of the supports and clamping them to the forms; removing the spacing members after the concrete has set; and providing suitable securing means for four-sided or round forms such as are used for making beams and tiers. These difficulties and others which will hereafter be referred to have been solved, and the object of this invention achieved by means of certain features of construction which are hereinafter fully described and illustrated, by way of example, in the accompanying drawing in which

Figure 1 is a view of two supports showing them secured to the walls of a form, the tie rod being broken away and one support being shown in plan view and the other support in section;

Figure 2 is a plan view of a modified form of the support;

Figure 3 a side elevation of the form of support shown in Figure 2;

Figure 3A a fragmentary perspective view showing a modification of the support shown in Figures 2 and 3;

Figure 4 a side elevation on an enlarged scale of the frusto-conical spacer shown in Figures 1 to 3;

Figure 5 a plan view on a reduced scale of a concrete form showing my cluster connector;

Figure 6 a perspective view on an enlarged scale of the cluster connector;

Figure 7 a perspective view on an enlarged scale of the corner adapter shown in Figure 5.

Figure 8 a plan view of the support adapted for use for a form having converging walls; and

Figure 9 a perspective view of a roughening tool for recesses in the concrete.

In the different figures corresponding numbers refer to corresponding parts.

The support extends between the walls of the form 1 and consists of a tie rod 2 having internally threaded enlarged ends adapted to receive bolts 3. Screwed or fitted over the said enlarged ends are frusto-conical spacer collars 4 adapted to bear against the inside of the walls of the form 1.

The other ends of the bolts 3 are knurled at 5 whereby the bolts may be screwed into the tie rod spindle 2 by means of pliers or a wrench.

To secure the walls of the form firmly in the required spaced-apart position lock nuts 6, 6 are threaded on the bolts 3 and tightened down against plates 7, 7 which extend over a batten 8. By tightening the nuts 6 against the plate 7 the walls of the form 1 are clamped between said nuts and the spacer 4.

A modified form of plate is shown in Figures 2 and 3 in which the plate takes the form of a strap 7' having a substantially right angle bend therein whereby one end is formed to pass around and be secured to a batten secured to the form or to some other part of the form by means of nails 10 passing through holes in the strap. The other end of the strap, which is made of resilient metal, extends upwardly at a slight angle and then is bent down at an acute angle. In the upwardly bent portion is a hole adapted to receive the bolt 3 and in the bent down end portion there is a slot through which the bolt extends and which forms prongs, one on either side of the bolt adapted to be pressed or driven into the side of the batten when the lock nut is tightened. The strap is conveniently and easily attached by means of nails or screws as shown, and can be easily removed, causing little or no damage to the batten or other support provided. This form of support is particularly adaptable to the building of shallow walls or thin concrete walls, which exercise small weight strain and enable light form construction with corresponding economy, to be used.

In Figure 3A is shown a modified form of strap 7'. Instead of the bifurcated end shown in Figures 2 and 3, a slot is provided for the passage of the bolt and the end lies flat against the batten and may be secured thereto by nails to the batten.

The plate 7 is provided with a boss 11 formed around the hole which is formed in the plate for the passage of the bolt 3. The boss 11 is provided with rounded or convex sides, and the inner sides of the lock nuts 6 are concaved to conform to the curvature of the bosses and thus form a swivel connection for the purpose of permitting the plate to adjust itself to the surface of the form maintaining a strong and secure bearing surface. Many surfaces of forms are irregular and many times the tie rods are not perfectly straight across from side to side. Sometimes the walls of the form are not parallel.

In the constructions shown in Figures 2 and 3 the upper surface of the strap 7' is not parallel with the lower surface of the nut until the nut is tightened down sufficiently to press down the

upwardly extending resilient end portion of said strap 7'. An adapter plate 13 may be inserted between the strap and the nut having a substantially semi-cylindrical boss 11' forming a swivel connection with the concave under surface of the nut. By means of this swivel connection perfect contact between the strap and the adapter plate is assured.

When the concrete has been poured and set, the bolts 3 are unscrewed and removed and the forms 1 are taken down and the frusto-conical spacers or collars 4 are removed, leaving recesses which are filled up with concrete in order to close the ends of the tie rods which are left in the concrete. As shown in Figure 4 the interior of the spacer is grooved or slotted so that a suitable instrument may be inserted to unscrew it from the end of the tie rod, or to pull it off in the event that it is merely slipped over the end of the tie rod as in some constructions. It has heretofore been proposed to roughen the external surface of a spacer by means of threads or longitudinal grooves so that when the spacer has been removed the internal surface of the recess which is left in the concrete will be roughened and affords a gripping surface to retain or anchor the additional concrete or cement with which the recess is filled. However, both these and other similar constructions have the great disadvantage that they make it difficult if not impossible to remove the frusto-conical spacer, particularly if the spacer is threaded on to the end of the tie rod and requires to be unscrewed. According to the present invention as shown particularly in Figure 4, the sides of the spacer member are of stepped formation, the walls of each step tapering outwardly towards the base of said spacer member. There is thus no straight walled part nor undercut part to make the removal of the member difficult, and when the member has been removed, the walls of the recess left in the concrete are of a corresponding form, having a plurality of ridges formed therein. These ridges assist in anchoring the filler in the recess, and this effect can be improved by means of a longitudinally ribbed frusto-conical tool 12 such as illustrated in Figure 9 which may be inserted in the recess and struck with a hammer or other tool so as to break or cut the ridges and make a more uneven surface and thus form a better bond between the filler and the concrete of the form.

For forming beams, tiers, columns, or corners of concrete walls, a number of tie rods may be connected together as illustrated in Figures 5 to 7 inclusive by means of a cluster connector 15 which may be of flat, circular or multi-sided construction having a plurality of threaded holes 15[a] therein adapted to receive the threaded ends of tie rods 2. A number of these cluster connectors may be used one above the other and a reinforcing rod, pipe, wire or cable, if desired, may be passed down through holes 15[b] in the middle thereof, or the cluster connectors may be supported one above the other by a rod or pipe passing through holes 15[b].

The form may be flat sided as shown in the drawing or round or other form, and an adapter may be used for those tie rods which are secured to an uneven surface. In Figure 7, is shown an adapter 16 for a corner, this being similar to the plate 7. The hole through the adapter 16 is provided with a boss 16[a] having a convex upper surface shaped and formed to conform to a concave inner surface on a lock nut 6, similar to the construction shown in Figure 1.

It is thought that the construction and use of the invention will be apparent from the above description of the various parts and their purpose. It is to be understood that the form of my invention herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of my invention, or the scope of the subjoined claims.

What I claim as my invention is:

1. A support for concrete forms, including a tie rod, a bolt, connected to the tie rod, a nut on the bolt, and a strap against which the nut is screwed, said strap being adapted to be secured to the form and having a resilient part provided with a hole through which the bolt passes and a prong extending inwardly at an acute angle to the resilient part and adapted to be driven into the form when the nut is tightened.

2. A support for concrete forms, including a tie rod, a bolt, connected to the tie rod, a nut on the bolt, and a strap against which the nut is screwed, said strap being adapted to be secured to the form and having an upwardly extending resilient part provided with a hole through which the bolt passes and prongs extending inwardly one on each side of the bolt at an acute angle to the resilient part and adapted to be driven into the form when the nut is tightened.

3. A support for concrete forms, including a tie rod, a bolt, connected to the tie rod, a nut on the bolt, and a strap against which the nut is screwed, said strap having one end formed to pass around and be secured to a batten on the form and having a resilient part provided with a hole through which the bolt passes and a prong extending inwardly at an acute angle to the resilient part and adapted to be driven into the form when the nut is tightened.

4. A support for concrete forms, including a tie rod, a bolt connected to the tie rod, a nut on the bolt, and a strap against which the nut may be screwed, said strap having a part adapted to be secured to the form and having a part extending inwardly at an acute angle to said first mentioned part, said last mentioned part being adapted to be secured to a part of the form extending at right angles to the part of the frame to which the first mentioned part of the strap is secured, said first mentioned part of the strap being provided with a hole adjacent the angularly extending part through which the bolt extends, and said angularly extending part having an opening therein adapted to receive the bolt when the strap is secured to the form.

5. A support for concrete forms, including a tie rod, a bolt connected to the tie rod, a nut on the bolt, and a strap against which the nut may be screwed, said strap having a part adapted to be secured to the form, a part extending at substantially right angles thereto, and a part extending at an acute angle thereto, whereby the strap may embrace a part of the frame with the end of the last mentioned part engaging the side of the part of the frame which the strap embraces, said strap being provided with a hole adjacent the last mentioned part through which the bolt extends, and said last mentioned part having an opening therein adapted to receive the bolt when the strap is secured to the form.

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