

March 29, 1932.

C. I. WILLIAMS

1,851,339

## CONCRETE FORM CONSTRUCTION

Filed June 20, 1929

2 Sheets-Sheet 1

Fig. 1.

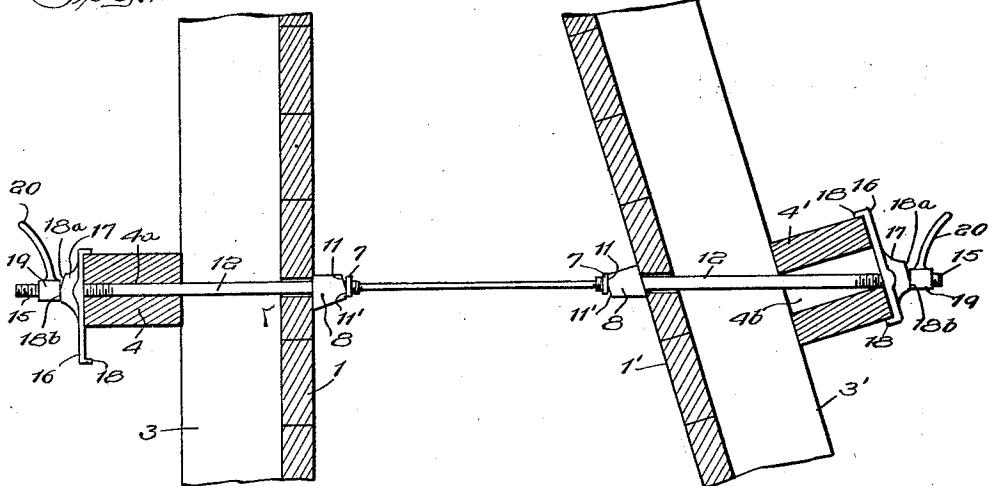


Fig. 2.

Fig. 3.

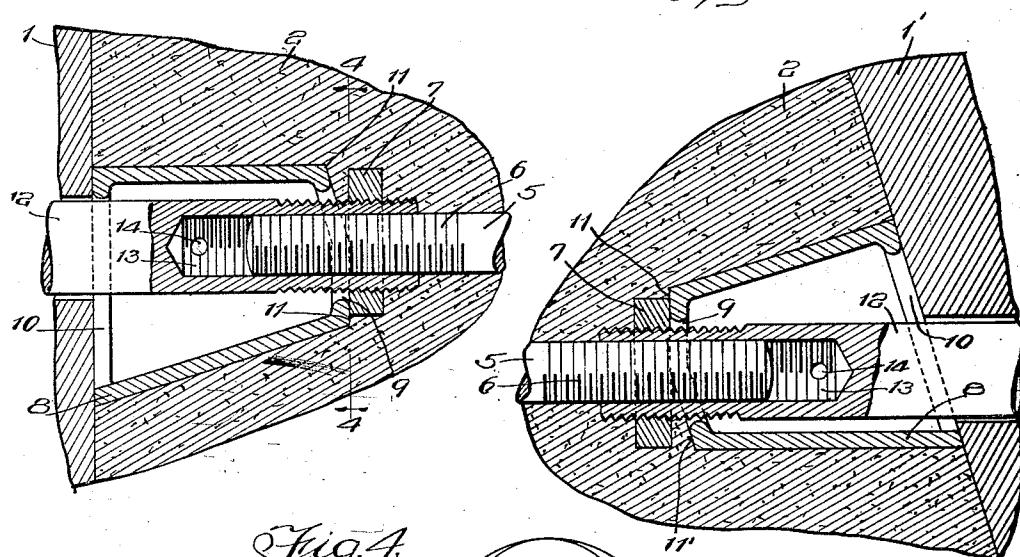
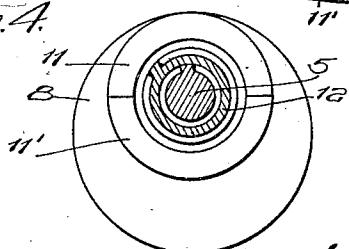


Fig. 4.



*Witness:*

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2 Sheets-Sheet 2

Fig. 5.

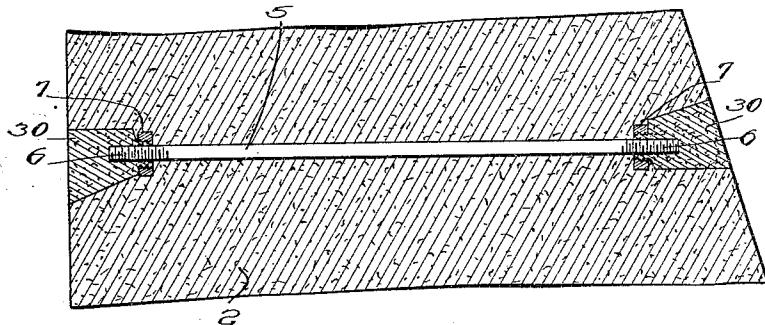


Fig. 6.

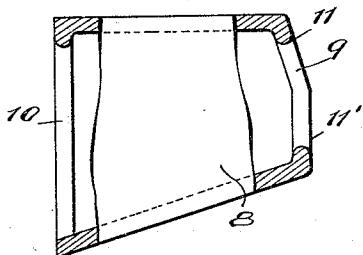


Fig. 7.

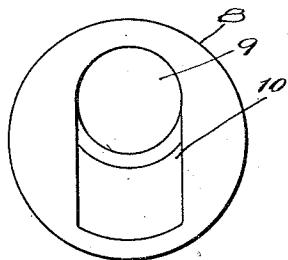


Fig. 8.

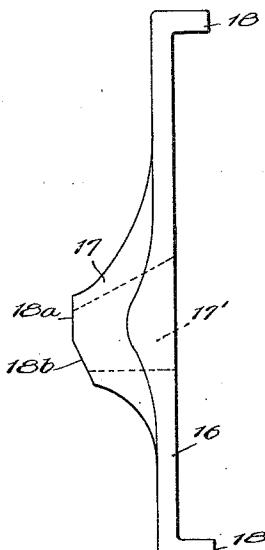
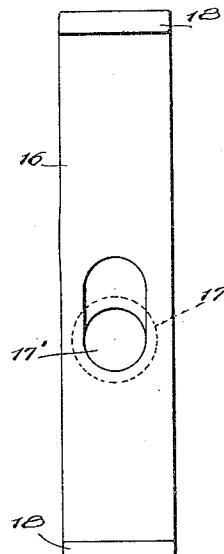


Fig. 9.



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## UNITED STATES PATENT OFFICE

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## CONCRETE FORM CONSTRUCTION

Application filed June 20, 1929. Serial No. 372,431.

My invention relates to concrete molds, forms and the like, and more particularly to an improved method of securing concrete forms and the like and removing the same.

5 This invention pertains to the same class of devices as those described and claimed in my Patent No. 1,680,923.

The invention has among its objects, the production of an improved securing means 10 for forms of the kind referred to which are simple, durable, efficient and satisfactory for use wherever found applicable.

My invention has as a particular object the production of a device of the kind described, which will satisfactorily produce molded structures.

Another particular object is to produce a device of the kind described which will be satisfactory for use interchangeably in connection with the molding of either a vertical or battered wall.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end, my invention consists in the novel construction, arrangement, and combination of parts herein shown and described and more particularly pointed out in the 30 claims.

Referring now to the drawings forming a part of this specification and representing a preferred embodiment of the invention:

Fig. 1 represents a sectional view through 35 a form illustrating the form set up for the molding of a wall having one vertical face and one battered face;

Fig. 2 is a vertical enlarged sectional view through a portion of the device shown in Fig. 1 with the concrete of the wall in place at the vertical face thereof;

Fig. 3 is a view similar to Fig. 2 taken at the battered face of the wall;

Fig. 4 is a sectional view taken on the line 45 4—4 of Fig. 2;

Fig. 5 is a sectional view through a completed wall;

Fig. 6 is a detailed fragmentary sectional view through a cone-shaped washer forming 50 a part of the invention;

Fig. 7 is a plan view of the device shown in Fig. 6;

Fig. 8 is a side elevational view of a clamp forming a part of the invention; and

Fig. 9 is a front elevational view of the 55 device of Fig. 8.

The particular form may be of any desired size, shape and material, this of course being dependent upon the work being molded or constructed. I have illustrated a portion of 60 a simple construction of wooden form for use in concrete work or the like, in which the numeral 1 represents a vertical form board and 1' a battered form board between which is to be molded a concrete wall. These form boards are arranged between the usual studdings or members 3 and 3', outside of which are arranged the bars or whalers 4 and 4'. The whalers are perforated as at 4a and 4b, the perforation 4b being enlarged as shown in 70 Fig. 1. Arranged between the form boards are bolt members 5 of suitable length which are preferably threaded as indicated at 6 and provided with jamb nuts 7. Each bolt is provided with a cone-shaped spacer member 8 at 75 either end so arranged that it may be withdrawn from the bolt, when the forms are removed, as will be hereinafter described. The spacer member 8 is formed with a round opening 9 therethrough at one end and with an elongated opening 10 at the opposite end, which functions in a manner to be described in facilitating removal of the spacer members.

It will be noted that the spacer members 8 do not represent a symmetrical frustum of a 80 cone but that the face at the small end thereof comprises two angularly disposed sections 11 and 11'. By means of this construction the spacer members 8 may be used interchangeably for either a vertical or a battered wall 90 as shown in Figs. 2 and 3.

Projecting through between the whalers 4 and 4' and their form boards 1 and 1', preferably at points between the studding, are bolts 12, each of which is interiorly threaded as indicated at 13 for engagement with the threaded end 6 of the tie rod 5 and same may also be provided with an opening 14 through the same to facilitate the removal of dirt or the like that may accidentally get into the re- 100

cess at the end of the bolt. The opposite or outer end of each bolt 12 is threaded as indicated at 15 and extends through what may be termed a whaler clamp 16 which I have shown 5 provided with an extending portion 17 and with a bolt hole 17' of a size greater than the bolt 12 so that the bolt may be pulled there-through. As most clearly shown in Fig. 8, the clamp 16 is provided with flanges 18 at 10 the ends arranged to overlie the faces of the whalers 4 and 4'. It will be noted that the extending portion 17 of the whaler clamp 16 is provided with angularly disposed faces 18a and 18b which function similarly to the angular faces 11 and 11' of the conical washer 15 in that the clamp may be used interchangeably for either a vertical or a battered wall, as shown in Fig. 1.

Arranged on the threaded end 15 of the 20 bolt 12 is a wing nut 19 or the equivalent (Fig. 1) preferably provided with a handle portion 20 so that the nut may be turned without requiring a separate wrench.

In using my apparatus, the form is prefer- 25 ably set up as shown in Figs. 1 to 3 and then the concrete or any equivalent material placed between the forms and permitted to set. It will be readily apparent that by means of the peculiar construction of the spacer members 30 8 and clamps 16 the same device may be used interchangeably on either a vertical or battered wall, and hence it is unnecessary to provide a plurality of devices for different types of structure. It will be particularly noted 35 that, with my device, the necessity of using wooden or other spreaders to retain a proper width of the form is eliminated, inasmuch as the cones 8 are held or maintained at the proper spacings by the nuts 7. Frequently 40 wooden spreaders are overlooked and left in the concrete and it is often a difficult proposition to remove the spreaders as the concrete is being cast, especially in a reinforced construction or a narrow one.

45 My improved method saves time in that respect, as, once the devices have been clamped in place, no attention is required for them until the forms are ready to be removed. After the concrete has set sufficiently, the 50 rods 12 and washer clamps 16 are removed and the form consisting of the (studded) whalers and form boards is taken out. There is absolutely nothing projecting from the surface of the concrete to retain the forms and 55 they can be taken off as an entirety and without having to be pried off, as is necessary when wires or bolts are used, which project out through the forms and the forms have to be removed before the wires can be cut off 60 flush with the concrete. Prying against the concrete to remove forms frequently results in the breaking off of corners or defacing of the concrete and particularly often results in the damaging of the form or form lumber. 65 When the rods 12 are removed, the forms are

entirely disconnected from the concrete structure.

After the forms have been removed, the spacer members 8 are removed, the surface of the concrete being left with a clean cut hole 70 therein entirely flush with the surrounding surface, which hole can be readily filled with cement or concrete as indicated at 30 in Fig. 5. The hole left after the removal of the cone from the concrete has a good depth and the concrete block or patch, being bounded by the threads of the rod 5 which is left in the concrete, is positively locked in place and will not come out at any later period. This gives 75 a good solid patch and there is no place for moisture to collect and gradually loosen the block.

80 One of the unique features of my invention is the fact that the forms are easily assembled and adjusted, each side being a complete unit, and whaler and form can be clamped and adjusted independently of the other side.

85 The value of the whaler clamp is a very important item. There is no necessity for using 90 heavy timbers and drilling the same full of holes for form bolts, thereby depreciating the value of the same for future use besides incurring the unnecessary initial cost of the same. Two planks of two inch timber, for 95 example, 2 x 4's or 2 x 6's, placed edgewise astride the form rods and held in place by whaler clamps, will serve the purpose just as well and are easily handled. They can be used without drilling or any waste of material whatsoever.

100 Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence, I do not wish to be understood as limiting myself to the exact form, construction, arrangement, and combination of parts herein shown and described or uses mentioned.

105 What I claim as new and desire to secure 110 by Letters Patent is:

1. In a device of the class described, a substantially frusto-conical member having a tapered opening therethrough and a plurality of angularly disposed surfaces at one end, the other end comprising an integral plate having a substantially diametrical slot therein.

2. In a device of the class described, a clamp for engaging a whaler bar or the like, an outwardly extending boss on said clamp, said clamp and boss having a substantially frusto-conical aperture therein, and said boss having a plurality of angularly disposed outer surfaces.

3. In a device of the class described, a substantially U-shaped clamp for engaging a whaler bar or the like, an outwardly extending boss on said clamp, said clamp and boss having a substantially frusto-conical aper-

ture therein, and said boss having a plurality of angularly disposed outer surfaces.

4. In apparatus of the kind described, a strut adapted to be disposed between opposed form members, nuts threaded intermediate the end of said strut, rods threadedly engaging the ends of said struts and adapted to pass through said form members, a spacer member mounted on each of said rods adjacent said nuts, and means including clamps disposed adjacent the outer ends of said rods for securing said form members, said spacer members and clamps each having a tapered bore, the ends of said spacer members and clamps adjacent the smaller ends of their respective bores being bounded by a plurality of angularly disposed faces.

In witness whereof, I hereunto subscribe my name this 24th day of May, A. D., 1929.

20 CHESTER I. WILLIAMS.

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