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G. O. GAETKE

2,126,251

FORM CLAMP

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Fig. 1.

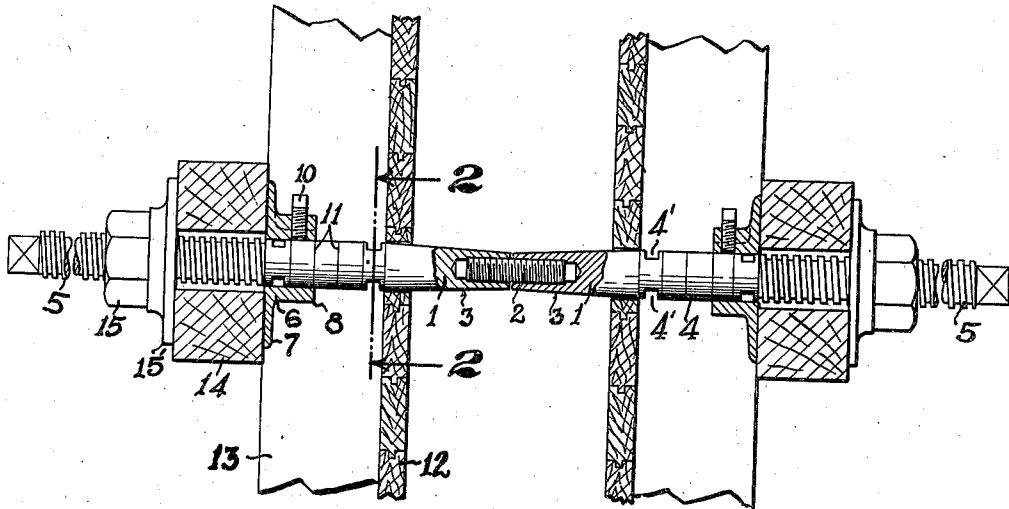


Fig. 2.

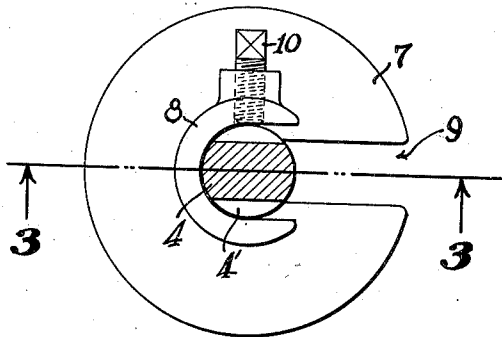


Fig. 4.

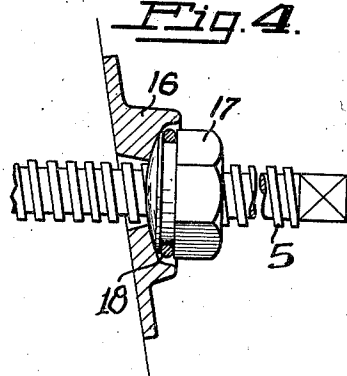
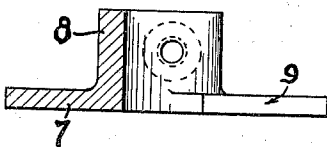


Fig. 3.



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FORM CLAMP

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4 Claims. (Cl. 25—131)

This invention relates to improvements in form clamps of the type employed in the erection of forms for concrete walls.

In providing means for maintaining the opposed walls of concrete forms in suitable positions with respect to one another while and after the plastic concrete material is being poured, it is particularly advantageous to employ clamping or tying means which is not only capable of being quickly applied in a proper position to the opposed walls of the form, but which after application firmly holds the walls in fixed predetermined positions with respect to each other. The present invention is intended to overcome many of the disadvantages of similar devices now commonly used: by providing a combined clamp and spacer which is capable of being readily adjusted to predetermined positions so as to maintain the form walls in suitably spaced positions with respect to one another in order that a concrete wall of uniform predetermined thickness may be formed; by providing a form clamp which is capable of being readily applied to the form upon which it is used; by providing a device of the kind characterized which embodies slidable and adjustable spacers which may be easily set at predetermined positions so as to provide a concrete wall of any desired thickness irrespective of the thickness of the studs, purlins or form walls; by providing a form clamp in which the various parts may be tightened and assembled in a comparatively short period of time; by providing a combined clamp and spacer which secures the walls of the form in securely locked positions capable of withstanding the vibratory action of mechanical vibrators and tampers ordinarily employed to effect a denser condition within the plastic body of concrete material; and by providing a form clamp which may be disassembled and detached from the form and concrete wall without the necessity of first dismantling the form.

Further objects of my invention will be pointed out hereinafter, indicated in the appended claims, or will be obvious to one skilled in the art upon an understanding of the present disclosure. For the purposes of this application I have elected to show herein certain forms and details of a form clamp representative of my invention; it is to be understood, however, that the embodiment of my invention shown and described herein is for the purpose of illustration only, and that therefore it is not to be regarded as exhaustive of the variations of the invention, nor is it to be given an interpretation such as might have the ef-

fect of limiting the claims short of the true and most comprehensive scope of the invention in the art.

In the accompanying drawing:

Fig. 1 is an elevation of a form clamp embodying my invention, showing certain parts in section;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1, showing one of the spacers in elevation;

Fig. 3 is a sectional view of one of the spacers taken on the line 3—3 of Fig. 2; and

Fig. 4 is a modified form of nut and washer capable of use when one of the form walls is to be held in an inclined position.

Referring to the drawing, the numerals 1, 1 designate two waler rods which are internally threaded at their inwardly disposed ends so as to provide suitable means for detachably securing them to a threaded stud on rod 2. The inner portion of each of the waler rods which ordinarily extends into the space within the form normally occupied by the concrete material, is gradually tapered as at 3 to permit the rod's convenient removal from the concrete wall within which it is imbedded after the plastic concrete becomes hardened. Each of the waler rods is made up of an inner smooth tapered section 3, a middle section 4 and an outwardly disposed threaded section 5. The middle section 4 of each waler rod is provided with one or more suitably shaped pairs of slots or grooves 4' which permit the convenient mounting of a slidable spacer element 6 on the said rod. Each spacer element 6 is formed with a disc-like end 7 and a slotted hub 8, the slot of each hub being slightly wider than the diameter of the section 4. An axial bore extending through the disc-like end 7 and the hub 8 is of sufficient size to slidably accommodate the middle section 4 of a rod 1. The disc-like end 7 of the spacer element is provided with a radially disposed slot 9 which is aligned with the slot of the hub and is of less width than the diameter of the axial bore, but slightly larger than the width of the section 4 of the rod 1. The points located between the oppositely disposed slots 4'. Thus the spacer element 6 may be slipped upon a rod 1 by passing the opposite sides of the radial slot 9 through the oppositely disposed slots 4' and then sliding the said spacer element to a position where the said rod becomes positioned in and fills the axial bore. Screwably extending through one side of the hub 8 and into its axial bore is a set screw 10 which facilitates the securing of the spacer element 6 in any suit-

able position on the rod 1. The middle sections 4 of the rods are provided with a number of similar calibrations or marks 11 which, together with the inwardly disposed ends of the hubs 8 of spacer elements 6, provide means for predetermining the distance between the oppositely disposed inner faces of the concrete form and thereby permitting the setting of the clamp so the form walls are held at the proper distance from one another to provide a concrete wall of predetermined thickness.

The concrete form within which the plastic concrete material forming the concrete wall is poured ordinarily comprises oppositely disposed and spaced form walls 12, studs 13 and purlins 14.

The outwardly disposed section 5 of each rod 1 is provided with large threads which permit a clamping or lock nut 15 screwably mounted thereon to be quickly screwed into engagement with a purlin 14 when the clamps are installed. Each nut 15 is preferably provided at its inner end with a circular flange 15' which is in the nature of a washer and facilitates the rapid assembly of the unit. The outwardly disposed ends of the rods are squared so as to permit a suitable wrench or tool to be applied for the purpose of detaching the inwardly disposed tapered end 3 of the rod from the concrete wall.

The clamps may be previously set or adjusted for any desired thickness of concrete wall by first locating the spacer elements 6 at the proper calibrations 11. The stud 2 is then screwed into one of the rods 1, and the latter is then placed in position at one side of the form by bringing its attached spacer element 6 against the inner face of a purlin 14; thereafter the attached clamping nut 15 is screwed against the outer face of the said purlin. From the opposite side of the concrete form the other rod 1 is then suitably positioned so its end may be screwed onto the stud 2 and to a point where the ends of the two rods 1 engage with one another. The spacer element 6 on the last mentioned rod 1, if not already set at the proper corresponding calibration 11, is so set, after which the said spacer element is brought into engagement with the inner face of the purlin 14 of the last mentioned side of the form. The clamping nut 15 upon being screwed against the outer face of the last mentioned purlin, completes the securing of the two sides of the form in fixed positions with respect to one another and in such positions that a concrete wall of predetermined thickness may be formed. The form clamps above described are set at suitable intervals along a concrete form in the usual manner.

In the form shown in Fig. 4 a wedge-shaped washer 16 is loosely mounted on the threaded end 5 of a waler rod. The washer 16 has an inner face disposed in an inclined plane which corresponds to the angle at which one side of a concrete form is to be positioned. The outer side of the washer 16 is provided with a concave seat which accommodates the spherical inner end of a locking nut 17, the latter being screwed onto the rod. A holding pin 18 serves to hold the nut 17 and the washer 16 together so they may be readily applied to the rod.

Having described my invention, what I claim is:

1. In a form clamp, a plurality of joined tension rods each having one or more pairs of opposed slots, a spacer element detachably mounted

on each tension rod, the said spacer elements each having a flanged end portion and a hub portion, also an axial bore within which its associated tension rod slidably fits and also aligned slots in the flanged end and in the hub which the slotted portion of the rod and its adjacent part respectively pass through when the spacer element is attached to or detached from the rod, the said slot in the flanged end being narrower than the diameter of the said bore; means associated with each spacer element for securing it to its respective tension rod, and lock nuts on the free ends of the rods.

2. In a form clamp, a plurality of joined tension rods each having a threaded end section upon which is screwed a lock nut for securing the clamp to a concrete form, the said tension rods each having one or more pairs of opposed slots, a spacer element detachably mounted on each rod and adapted to engage with the concrete form, the said spacer elements each having a flanged end for engaging with the form and a hub portion, also an axial bore within which its associated tension rod slidably fits and also aligned slots in the flanged end and in the hub which the slotted portion of the rod and its adjacent part respectively pass through when the spacer element is attached or detached from the rod, the said slot in the flanged end being narrower than the diameter of the said bore and means associated with each spacer element for securing it to its respective tension rod.

3. In a form clamp, a plurality of joined tension rods each having an outwardly disposed threaded section, a middle section and an inner tapered section, a lock nut screwed on each threaded section for engaging with a concrete form, and a removable spacer element adjustably secured to the middle section of each rod for also engaging with the said form, each spacer element having a hub and an axial bore within which its associated tension rod is normally positioned and each spacer element having a slot in its side and in its hub which joins the axial bore, the said slot being of sufficient size so the tension rod may pass therethrough but narrower than the diameter of the axial bore, whereby the said spacer element may be attached and detached from its associated tension rod and means associated with each spacer element for securing it to its respective tension rod.

4. In a form clamp, a plurality of joined tension rods each having an outwardly disposed threaded section, a middle section and an inwardly disposed tapered section, a lock nut screwed on each threaded section for engaging with a side of a frame member of a concrete form, and a spaced element adjustably and removably mounted on the middle section of each tension rod for engaging with the opposite side of the frame member, the spacer elements each having a hub provided with an axial bore through which its associated tension rod slidably extends, and each spacer element having a slot in its side and in its hub which joins the axial bore, the said slot in the spacer element being narrower than the diameter of the bore and of sufficient size to permit the slipping of the said element on its associated rod, and means on the hub for securing its associated spacer element to a tension rod.

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