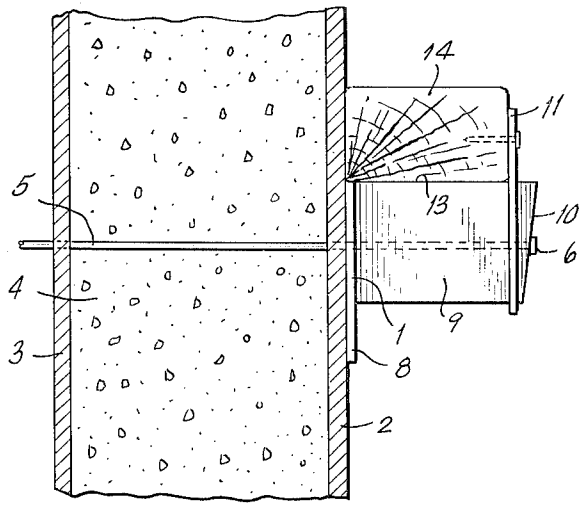
March 22, 1966 L. R. FOY 3,241,803

MID-TOOL FORM TIES HOLDER

Filed May 18, 1964

Fig. 1.



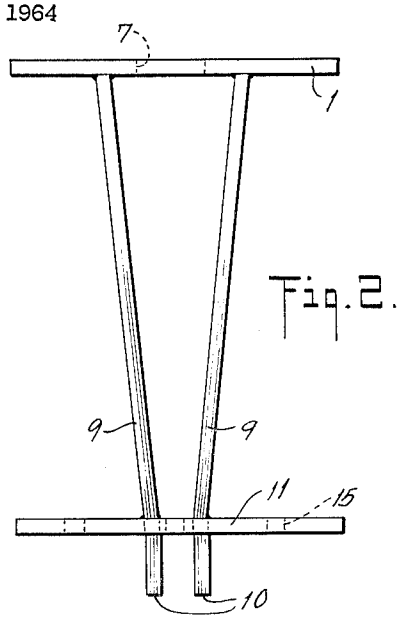
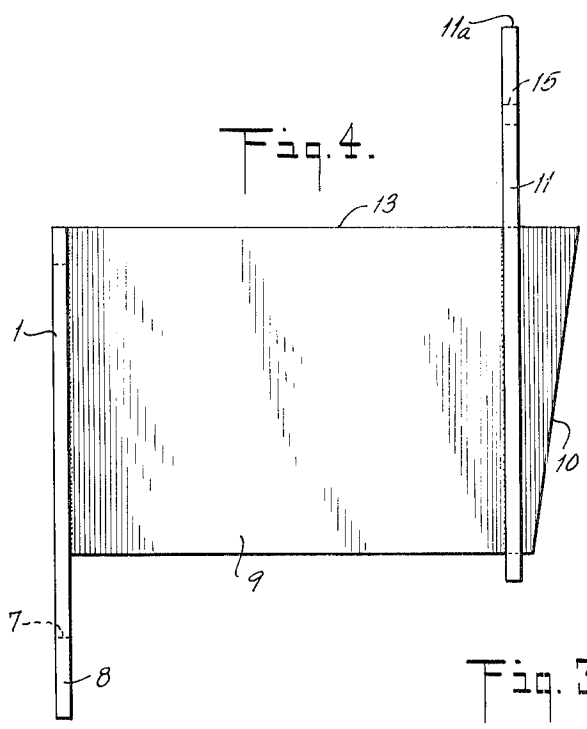


Fig. 2.

Fig. 4.



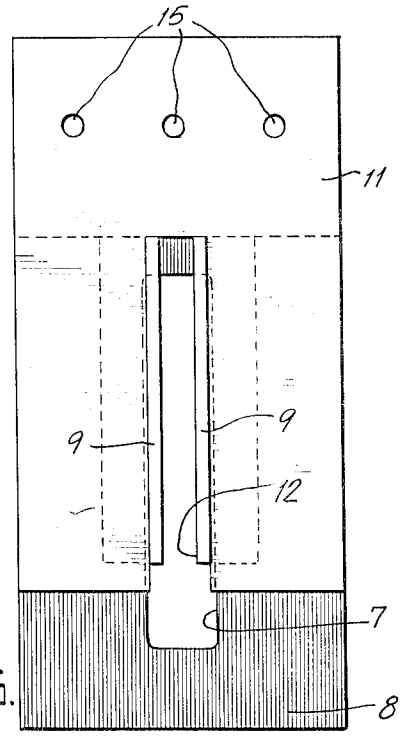


Fig. 3.

INVENTOR.
LYLE R. FOY
BY
Kenyon & Kenyon
ATTORNEYS

United States Patent Office 3,241,803
Patented Mar. 22, 1966

3,241,803

MID-TOOL FORM TIES HOLDER

Lyle R. Foy, 24 Countryside Drive, Hutchinson, Kans.

Filed May 18, 1964, Ser. No. 367,931
4 Claims. (Cl. 249—219)

This invention relates to form tie holders for concrete forms and in particular to such holders for use on tie rods to hold forms of plywood or the like during pouring of concrete and until the concrete has set.

When such concrete forms are employed, it is customary to employ tie rods which extend through the forms and the concrete contained by them. To hold the forms in position, the ends of the tie rods are provided with a suitable head which may be a nut. Heretofor, form tie holders have been available and have served their function well, but have been of such nature that their installation and removal has been quite time consuming. Since these holders must be placed and removed by hand, the placing and removal of them involves extensive labor costs.

One of the objects of this invention is to provide a form tie holder which is simple in construction and which may be quickly and easily placed in position on the forms or removed therefrom. Another object is to provide such a form tie holder which obviates the difficulties encountered with form tie holders now available, but which can be made as cheaply and easily as such holders. Other objects and advantages of the invention will appear from the following specification in which there is described for purposes of illustrating the invention a form there of which is at present preferred and which gives desirable and satisfactory results, it being understood, however, that the invention is not limited to the specific form of holder disclosed as illustrative of the invention.

The holder comprising the present invention consists of a flat plate adapted to engage the outer surface of a form such as a plywood or wooden form. This plate has a centrally disposed vertically extending slot or aperture adapted to receive the end of a tie rod extending from the form. The slot permits vertical adjustment of the holder for reasons which will be apparent from the following description.

The flat plate has an extension guide portion which extends downwardly from said plate and is preferably an integral extension of the plate which is formed of suitable metal plate material. This extension guide portion extends downwardly from the plate and well below the tie rod to facilitate the installation and removal of the holder and to eliminate binding or cocking of the holder at such time.

A pair of vertical walls formed of suitable plate material extend from opposite sides of the slot or aperture in spaced relation. They are spaced apart far enough to receive the tie rod therebetween, but close enough so that their outer edges engage the head of the tie rod. The outer edges of these walls terminate in outwardly facing cam or wedge faces which are adapted to engage the head member of the tie rod and wedgingly seat the holder between the form and the head of the tie rod. These faces face generally outwardly and downwardly forming a relatively small angle with the vertical so as to provide the desired mechanical advantage as wedges.

Adjacent the outer ends of the vertical walls is a second flat plate which is vertically slotted with a slot opening at the bottom thereof. The vertical walls are inserted in this slot maintaining their spacing and are secured to the plate with their ends extending outwardly to expose the cam or wedge faces. The slot opening at the bottom permits the holder to be moved downwardly over the tie rod so that the cam or wedge faces can engage the head as described above.

The upper end of the second plate extends above the top surfaces of the edges to form a seat and holder for a reinforcement member for the form.

The vertical slot in the flat plate is of a width to permit the head of the tie and extends below the main body of the plate down into the extension guide portion and below the lower edges of the vertical walls which extend from the sides of the slot so that the holder may be easily placed on the form by passing the head of the tie rod through the lower end of the slot, placing the flat plate and its extension guide portion flat against the form with the tie rod vertically aligned with the open space between the outer edges of these walls so that downward sliding of the holder against the form will bring the proper parts into position to wedgingly support the form. This is easily accomplished because it is not necessary to cock the holder or plate to install it and the holder easily slides to position. On removal the movements are reversed and the holder slides flat against the form to a position where the head of the tie rod is disengaged from the outer edges of the wall and it is then easy to merely move it outwardly to pass it over the head of the tie rod without cocking or manipulating it.

In the drawings, FIG. 1 is a side view partially in section showing form tie holder in position on a form and engaging the tie rod. FIG. 2 is a top plan view of the tie holder. FIG. 3 is a front elevational view and FIG. 4 is a side view.

The tie holder shown in the drawings as an embodiment of the invention consists of a flat plate **1** which is adapted to lie flat against the form **2** which is here shown combined with another form **3** with concrete **4** therebetween and a tie rod **5** extending through the forms and the concrete outwardly to a head portion **6** which may be a nut or any other suitable head.

The flat plate **1** is provided with a vertical slot or aperture **7** centrally disposed and adapted to receive the tie rod **5**. The slot extends vertically to permit movement of the holder up and down for reasons which will be apparent. The slot is of a width to permit the insertion of the head **6** of the tie rod, at least at some point in its length and may, as shown, be of uniform width.

The flat plate **1** is provided with an extension guide portion **8** which extends downwardly from the plate to engage the face of the form during installation or removal of the holder from the form and to guide the holder and maintain it in proper position during such installation or removal.

In the form of the invention shown, the extension guide portion **8** which extends downwardly from the plate **1** is formed integrally with the plate which is formed of suitable metallic plate material.

A pair of vertical wall members **9** extend horizontally from the plate **1**, from opposite sides of the slot or aperture **7**. They are spaced apart sufficiently to receive the tie rod **5** therebetween, but are closely enough spaced so that the head **6** of the tie rod cannot be pulled between them.

These walls are formed of any suitable metallic plate material and terminate at their outer edges in cam or wedge faces **10** which face outwardly and slightly downwardly and are adapted to engage the head **6** of the tie rod.

The cam or wedge faces **10** are at a slight angle to the vertical so as to provide satisfactory wedging action when the form tie holder is seated. An angle of about 10° from the vertical as indicated in the drawing is satisfactory although this angle may be varied without departing from the invention.

The vertical walls **9** may converge slightly as shown in the drawings to provide stability.

Adjacent the outer edges of the walls **9**, there is a second flat plate member **11** which is slotted at **12** with an open bottom slot to facilitate placing the holder over the tie rod. The outer ends of the vertical walls **9** extend through this slot and are suitably secured to the plate by welding for instance. In this way spreading of the walls is obviated in use.

The upper end **11***a* of the flat plate member **11** extends above the upper edges **13** of the walls to provide a seat and holder and a reinforcement member **14** which may be a two by four. Suitable holes **15** are provided for nails or other fastening members.

The vertical slot **7** extends into the extension guide portion **8** as shown in FIG. 3 for a distance of at least five-eighths of an inch. This permits the plate **1** to be placed flat against the form after it has been placed over the tie rod and before the holder is slid to final position so that it is simpler and easier as pointed out above to install and remove the holder.

Suitable sheet steel material may be employed and it has been found that one-eighth inch material is satisfactory. The vertical walls may be welded to the plate **1** to give satisfactory results.

In use the forms are set up as shown in FIG. 1 with the tie rod **5** disposed as illustrated. The tie rod is inserted through the slot **7** and the holder is then placed with the plate **1** against the face of the form **2** above the tie rod **5** with the rod in the lower portion of the slot **7**. It is then slipped down into the position shown in FIG. 1. The plate **1** is seated against the surface of the form **2** as is the extension guide portion **8**. The holder is then wedged into position to securely brace the form **2**. In the form tie holder shown, the extension guide portion **8** serves the important function of keeping the form tie holder from catching or binding during the insertion.

It has been found in a form tie holder such as that shown where the vertical walls are about 2½ inches in height and where the head of the tie rod is engaged by the cam or wedge faces **10** in the manner shown in FIG. 1 that an extension guide portion formed integrally with the plate **1** and extended about 1½ inches downwardly from the plate will satisfactorily prevent catching or binding as the holder is slid into place and will likewise facilitate removal of the holder when it is desired to remove the forms after the concrete has set. The lower edge of the extension guide portion lies significantly below the lower edge of the vertical walls and thus properly seats the form tie holder.

By using the extension guide portion **8** the force exerted at the lower edge of said portion **8** normal to the face of the form is reduced to an amount materially less than such a force normal to the surface of the form would be if the plate **1** terminated at the lower edge of the vertical wall members **9** and resulting from a force exerted downwardly on the form tie holder. In the particular form of the invention disclosed, the force at the lower edge of the extension guide portion **8** is 50% less than the force which would result if the plate **1** terminated at the lower edge of the wall portions and in the particular case, the force tending to press the lower edge of the extension guide portion is so reduced as to become negligible and practically eliminate any tendency for the lower edge of the extension guide portion to dig into the face of the form.

By the particular arrangement of parts the lever arm extending from the head **6** of the tie rod **5** and effective to force the lower edge of the extension guide **8** into the face of the cam is materially lengthened to thus in effect reduce the effective force normal to the surface of the form **2**.

Practical experience shows that when the plate **1** terminates at the lower edge of the wall members **9** a force exerted downwardly on the form tie holder in normal installation will cock the holder and cause the lower edge to dig into the form and bind, whereas with the extension guide portion **8** on a similar form tie holder there will be

no significant binding so that it is much easier to install and remove the form tie holder. In a typical situation where the form tie holder would have to be installed and removed approximately eight thousand times to complete a job the saving in time and hence labor costs would amount to approximately three-thousand dollars ($3,000), a significant and unobvious saving.

It will be appreciated that the present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof. It is, therefore, desired that the present embodiments be considered in all respects as illustrative and not restrictive reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

What is claimed is:

1. A form tie holder for concrete forms comprising a flat plate for engaging the outer surface of a form and having a vertically extending aperture to receive a tie rod extending from said form, said plate having means extending downwardly therefrom to engage the face of the form during installation and removal of the holder from the form to prevent binding comprising a coplanar extension of said plate, a pair of vertical walls spaced apart to receive an end of a tie rod therebetween and extending from and secured to said plate on opposite sides of the aperture in said plate, said walls terminating in wedge faces facing outwardly and downwardly to engage a head member on a tie rod and wedgingly seat said tie holder against the form as it is slid downwardly on the form and a second plate joining the ends of and secured to said vertical walls slotted to its edge for passage of the tie rod.

2. A form tie holder for concrete forms comprising a flat plate for engaging the outer surface of a form and having a vertically extending aperture to receive a headed tie rod extending from said form, said plate having means extending downwardly therefrom to engage the face of the form during installation and removal of the holder from the form to prevent binding comprising an extension of said plate, and a pair of vertical walls spaced apart to receive an end of a tie rod therebetween and extending from and secured to said plate on opposite sides of the aperture in said plate, said walls terminating in wedge faces facing outwardly and downwardly to engage a head member on a tie rod and wedgingly seat said tie holder against the form as it is slid downwardly on the form said vertically extending aperture extending below the lower edge of said vertical walls to permit the placing of said plate flat against a form with said vertically extending aperture around a tie rod before moving said holder downwardly to engage a head on said tie rod with said wedge faces.

3. A form tie holder for concrete forms comprising a flat plate for engaging the outer surface of a form and having a vertically extending aperture to receive a headed tie rod extending from said form, said plate having means extending downwardly therefrom to engage the face of the form during installation and removal of the holder from the form to present increased area to said face and reduce unit pressure against the surface of said form and to prevent binding comprising an extension of said plate, and a pair of vertical walls spaced apart to receive an end of a tie rod therebetween and extending from and secured to said plate on opposite sides of the aperture in said plate, said walls terminating in wedge faces facing outwardly and downwardly to engage a head member on a tie rod and wedgingly seat said tie holder against the form as it is slid downwardly on the form said vertically extending aperture extending below the lower edge of said vertical walls to permit the placing of said plate flat against a form with said vertically extending aperture around a tie rod before moving said holder downwardly to engage a head on said tie rod with said wedge faces.

4. A form tie holder for concrete forms comprising a flat plate for engaging the outer surface of a form

and having a vertically extending aperture to receive a headed tie rod extending from said form, said plate having means extending downwardly therefrom to engage the face of the form during installation and removal of the holder from the form to prevent binding comprising a coplanar extension of said plate, and a pair of vertical walls spaced apart to receive an end of a tie rod therebetween and extending from and secured to said plate on opposite sides of the aperture in said plate, said walls terminating in wedge faces facing outwardly and downwardly to engage a head member on a tie rod and wedgingly seat said tie holder against the form as it is slid downwardly on the form said vertically extending aperture extending below the lower edge of said vertical

walls to permit the placing of said plate flat against a form with said vertically extending aperture around a tie rod before moving said holder downwardly to engage a head on said tie rod with said wedge faces.

References Cited by the Examiner

UNITED STATES PATENTS

2,967,689	1/1961	Jahn	249—219
3,030,059	4/1962	Jahn	249—219

J. SPENCER OVERHOLSER, *Primary Examiner.*

G. A. KAP, *Assistant Examiner.*