Jan. 16, 1951 W. KITTAS 2,538,526

ADJUSTABLE CONCRETE FORM CLAMP

Filed June 23, 1950

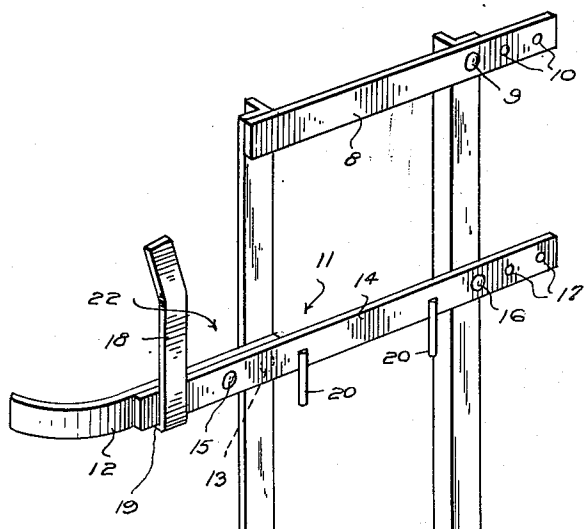
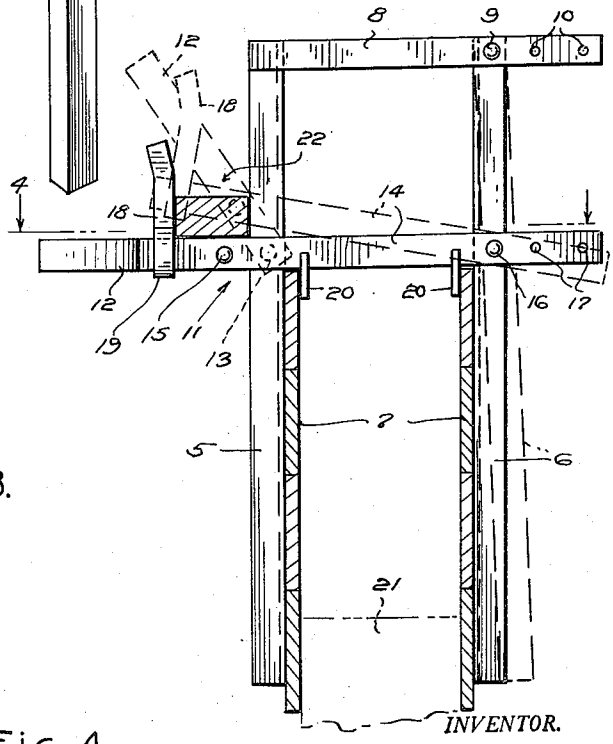



Fig. 1.

Fig. 2.



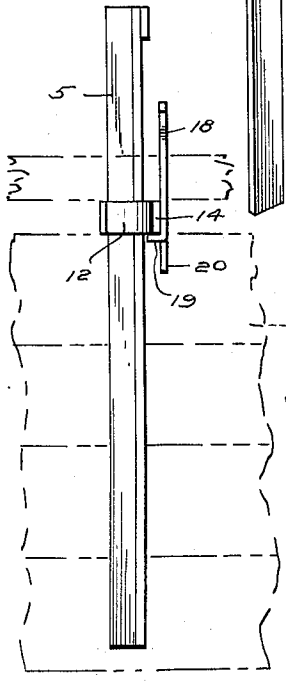




Fig. 3.

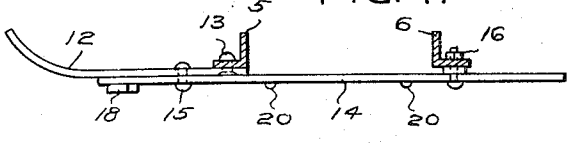



Fig. 4.

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Patented Jan. 16, 1951 2,538,526

# UNITED STATES PATENT OFFICE

2,538,526

## ADJUSTABLE CONCRETE FORM CLAMP

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Application June 23, 1950, Serial No. 169,859

2 Claims. (Cl. 25—131)

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This invention relates to improvements in adjustable concrete form clamps and has for its object, a form clamp constructed in a manner to straddle a pair of spaced concrete forms in a manner to prevent the spreading of the forms when concrete is poured therein.

An object of the invention resides in providing a pair of rigid leg portions, having a cross head rigidly fixed to the upper end of one leg and with the upper end of the other leg adjustably and pivotally connected with the cross head and toggle links connected with the legs at a point below the cross head in such manner that the pivotally connected leg may be shifted outwardly on its pivot to facilitate the engagement of the legs over the form boards, with the toggle links subsequently serving to shift the pivotally connected leg inwardly to firmly engage the sides of the forms to prevent spreading thereof when inward pressure is exerted thereon.

A further object of the invention resides in providing a pair of lugs rigidly positioned upon one of the toggle links and adapted to engage over the upper edges of the form boards and to be positioned inwardly of the forms when the clamp is shifted to firm engagement with the forms and serving to prevent inward movement of the forms.

Another object of the invention resides in the provision of a rigid bracket upon one of the toggle links outwardly of the legs, to provide a socket for the reception of an aligning board, whereby a plurality of form clamps spaced apart upon a form will be maintained in alignment and insure of a straight beam, lintel, belt course or the like poured in the forms.

In the formation of poured concrete beams, lintels, belt courses or the like, much difficulty has been experienced in maintaining the usual wood forms in a straight line and against spreading or otherwise shifting and the clamp of the present invention provides a very rigid and adjustable structure that is easily engaged over the forms and quickly and easily moved to clamping engagement with the sides of the forms, with the clamps being employed in multiple and at predetermined points along the forms to prevent flexing of the forms when concrete is poured therein and in addition, each clamp equipped with a sock for the reception of an alignment board, such as a two by four that extends through the sockets of a plurality of the clamps to retain the clamps in alignment and avoid any tendency toward twisting of the forms.

Other obvious features of novelty will be readily apparent during the course of the following

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description, reference being had to the accompanying drawings, wherein has been illustrated a preferred example of the invention and wherein like characters of reference are employed to denote like parts throughout.

In the drawings—

Figure 1 is a perspective view of a clamp constructed in accordance with the invention,

Figure 2 is a side elevation thereof with the clamp in clamping engagement with the concrete forms,

Figure 3 is an edge view of the device and,

Figure 4 is a horizontal section, taken on line 4—4 of Figure 2.

Referring specifically to the drawings, the numerals 5 and 6 denote a pair of identical rigid clamping legs, preferably formed of angle iron. The legs 5 and 6 are spaced apart a predetermined distance and are arranged with one of their flat flanges in opposed relation to each other for flat clamping engagement with the outer sides of conventional wood forms 7, shown in Figure 2.

The leg 5 is rigidly connected, as by welding, at its upper end, to a right angle cross head, indicated in the present instance, as a bar 8. The bar 8 is pivotally and adjustably connected at 9, to the upper end of the leg 6, the pivotal means being in the form of a bolt, whereby the leg 6 may be shifted outwardly to any one of a series of bolt openings 10, formed in the bar. The purpose of varying the spacing between the legs 5 and 6, is to accommodate the clamp to forms of varying widths. While the legs 5 and 6 have been shown as being angle irons, it will be apparent that other cross sectional irons may be employed, such as channel irons, T-irons or the like. While the cross head 8 has been shown as being a flat iron bar, it will be apparent that an angle iron could be employed with equal success.

Means are employed to shift the leg 6 toward and from the leg 5, as indicated in dotted lines in Figure 2, to facilitate the straddling engagement of the legs over the forms 7, comprising a toggle device, indicated as a whole by the numeral 11. The toggle device 11 is arranged a predetermined distance below the cross head 8 and when in full clamping position, substantially parallels the cross head. The toggle device includes a lever portion 12, curved at its free end. The lever is pivotally connected to the leg 5, as at 13. A toggle link 14, is pivotally connected at 15 to the lever 12, outwardly of the leg 5, while the opposite end of the link 14 is detachably and adjustably connected to the leg 6,

by a removable bolt 16. The link 14 extends beyond the leg 6 a distance equal to the extension of the cross head 8 and is provided with a plurality of pivotal openings 17, equal in number and spacing to the openings 10. Through the pivotal bolt connections 9 and 16, the leg 6 may be easily adjusted outwardly to accommodate forms of varying widths, yet maintaining its normal parallel relation to the leg 5. The link 14, outwardly of the pivot 15, is provided with an upstanding rigid bar 18, welded or otherwise permanently attached thereto. The upper end of the bar is preferably inclined outwardly, as shown and for a purpose to be described. The lower end of the bar 18 is bent inwardly at a right angle to provide a stop 19, that underlies the lever 12 as a means to limit the downward swinging movement of the lever to clamping position. The link 14 is provided with a pair of lugs 20, welded thereto, serving as a means to engage over the upper edges of the forms 7 inwardly thereof, to prevent any tendency of the forms to flex inwardly prior to the pouring of the concrete therein.

In the use of the device, the forms 7 are positioned and supported at proper elevation at the upper edge of a masonry wall 21, with the forms engaging the inner and outer sides of the wall. A plurality of the clamp devices are adapted to be positioned in straddled relation to the forms at predetermined spaced points. Each clamp is then extended, by swinging the lever 12 upwardly, as in dotted lines in Figure 2. This swinging movement shifts the corresponding end of the link 14 upwardly and inwardly, with the result that the leg 6 is shifted outwardly upon its pivot bolt 9, to the dotted line position of Figure 2. In this position, the legs can be easily and convenient y engaged over the forms 7 to a point where the upper edges of the forms stop against the link 14. The lever is then forced downwardly to the full line position, where it engages the stop 19, which action returns the leg 6 to its normal parallel relation to the leg 5 with a firm clamping of both legs 5 and 6 against the sides of the forms 7. As the link 14 moves downwardly, the lugs 20 engage against the inner sides of the forms. The bar 18, in the clamping position of the several parts, is normally parallel with the leg 5. After the required number of clamp devices have been positioned upon the forms, a preferably two by four timber of required length is forced into the socket 22, formed by the leg 5 and the bar 18, thus causing all the clamps in that particular group to become accurately aligned and insuring that the forms 7 will be maintained in a straight line against twisting, when the concrete is poured therein. After the concrete is sufficiently set, the timber is removed and the several levers 12 are swung upwardly to the release position and the clamps removed.

It will be apparent from the foregoing, that a very simple and novel form of clamping device has been provided. The clamps are cheap to manufacture, are exceptionally strong, easy to install and remove and provide a very effective means for preventing the outwardly flexing of the forms under the great pressure exerted by the pouring of concrete therein. The alignment of the several clamps through the medium of the socket 22 is extremely advantageous and avoids considerable trouble and expense in maintaining the forms in a straight line. The form clamps readily adapt themselves to forms for use in foundations, belt courses, lintels, beams or the like and are adjustable within the range generally recognized in structural concrete work.

It is to be understood, that the invention is not limited to the precise form shown, but that it includes within its purview, whatever changes fairly come within either the terms or the spirit of the appended claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a clamp for straddling engagement over a pair of spaced parallel concrete form boards that consists of a pair of normally parallel rigid legs adapted to have parallel clamping engagement with the outer sides of the boards, the legs being spaced apart and adjustable outwardly, a cross head rigidly fixed to the upper end of one leg, the upper end of the other leg being pivotally connected to the cross head, a toggle device for swinging the pivoted leg outwardly upon its pivot, the toggle device including a toggle link that is pivotally connected with the pivoted leg below the cross head, a lever having one end pivotally connected to the other leg, pivotal connection between the lever and the link outwardly of the leg, a socket forming bar fixed adjacent the free end of the link, a stop formed upon the bar to limit the downward swinging movement of the lever, the socket adapted to receive an aligning timber that extends through a plurality of aligned clamp devices and lugs fixed upon the link to engage upon the inner sides of the form boards.

2. A clamp for straddling and clamping engagement with the outer sides of a pair of parallel spaced wooden form boards that consists of a pair of spaced rigid angle irons normally parallel with each other and with a flat side of each iron arranged in opposed relation to its companion iron, a right angle rigid cross head fixed to the upper end of one angle iron, the cross head at its free end provided with a plurality of pivotal openings, the other angle iron being pivotally connected with the cross head in one of the openings, a toggle device for swinging the pivoted angle iron outwardly for engagement of the clamp over the form boards and to swing the pivoted angle iron inwardly to clamping engagement with the sides of the boards, the toggle device including an actuating lever that is pivotally connected to the first named angle iron below the cross head and extending outwardly in a normal horizontal position substantially parallel with the cross head, the free end of the lever being curved laterally, a toggle link pivotally connected with the lever at a point outwardly of the lever pivot and pivotally connected at its opposite end with the pivoted angle iron, the free end of the link being coextensive with the free end of the cross head and provided with a plurality of pivotal openings identical in spacing and number with the cross head, the pivotal connections with the pivoted angle iron being removable, the link being extended beyond its point of pivotal engagement with the lever and provided with a rigid, vertically arranged socket forming bar having its lower end turned inwardly to form a stop for the lever, the bar being normally parallel with the first named angle iron and having its upper end inclined outwardly, the bar providing a socket with the first named angle iron to receive a rigid timber therein to rest upon the top edges of the lever and the link and which extends through a plurality of corresponding sockets formed by a plurality of clamp devices spaced along the forms and lugs fixed upon the

link and extending downwardly to engage upon the inner sides of the form boards when the toggle device is shifted to swing the pivoted angle iron inwardly to clamping engagement with the form.

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