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CLAMPING SYSTEM FOR CONCRETE WALL FORMS

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2 Sheets-Sheet 1

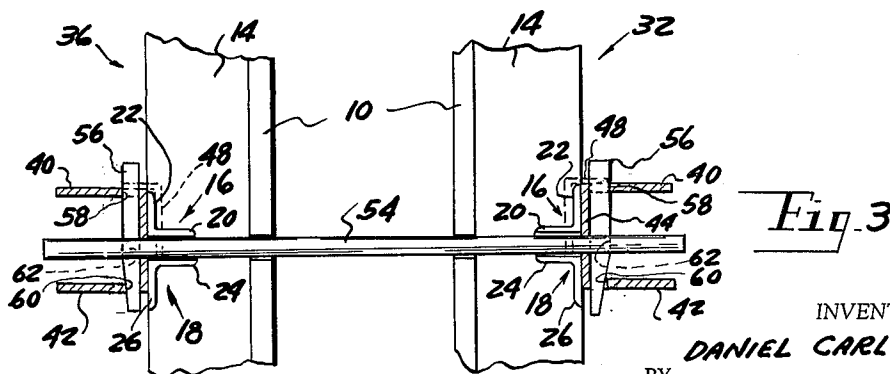
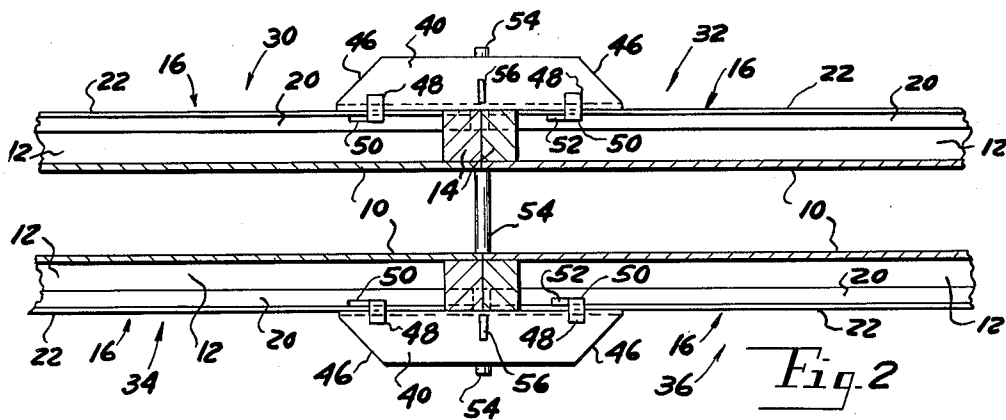
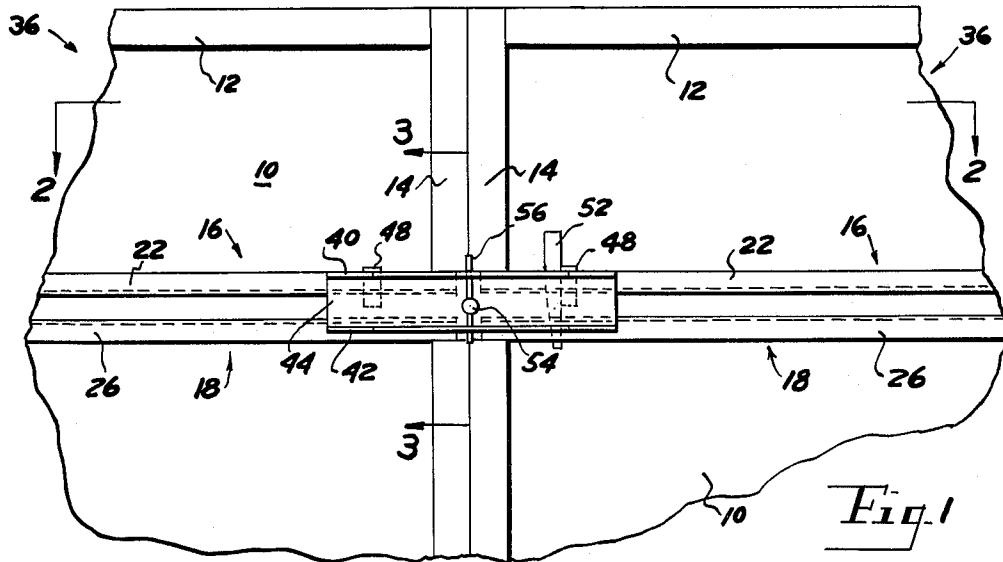


Fig. 3

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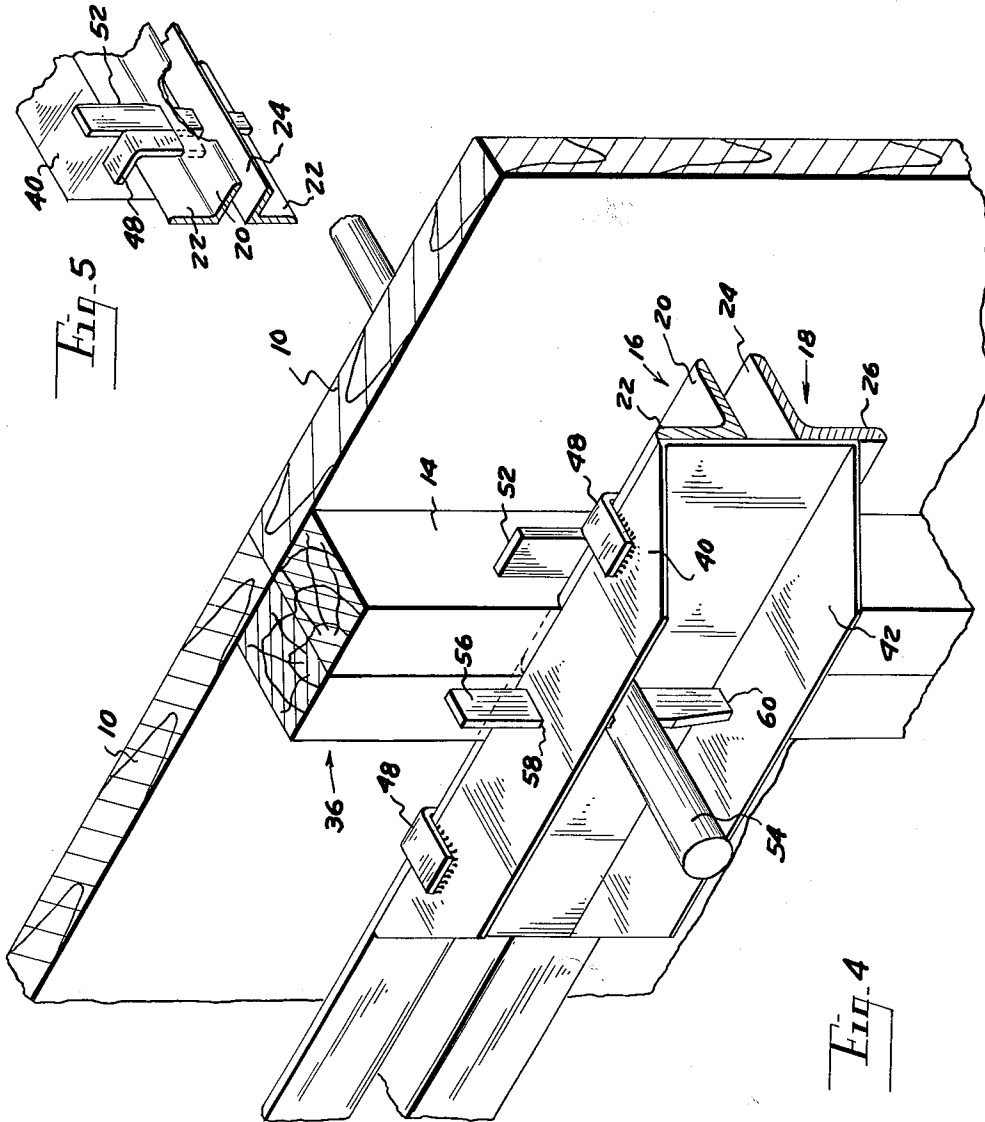
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2 Sheets-Sheet 2



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CLAMPING SYSTEM FOR CONCRETE
WALL FORMS

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3 Claims. (Cl. 25-131)

This invention relates to forms used in pouring concrete walls and more particularly to a system and apparatus for locking adjacent form sections to one another so as to create continuous form sections.

Vertical concrete walls are normally constructed by arranging sets of planar wooden forms parallel to one another in a vertical position, and spaced from one another by a distance equal to the thickness of the desired wall. Concrete is then poured between the forms and the forms are removed when the wall is fully set. The forms used are normally of a standard height and length and elongated wall sections are made by locking a series of forms adjacent to one another.

A common type of form utilizes plywood as the planar concrete contacting surface. The edges of a plywood rectangle are reinforced by vertical and horizontal wooden beams, which are disposed on the outer surface of the form. Additional vertical beams may extend between the horizontal edge members at spaced distances along the length of the panel. Additional horizontal reinforcing members normally take the form of a pair of angle irons which extend the length of the forms; each iron having one flange disposed in the horizontal plane, fitted in notches in the vertically extending wooden beams, and facing the similarly disposed flange of its adjacent angle iron. These angle irons are termed "walers." It is the specific purpose of the present invention to provide a system for joining adjacent prefabricated wall forms by means of connection with their walers, so as to create elongated forms.

Means must also be provided for separating the two opposed form sections by an appropriate distance from one another and for locking them in this relationship so as to resist the horizontal pressure exerted by the concrete. Such horizontal locking is normally achieved by a series of bars which extend between the two forms and are fixed to each of them. While these bars extend through the concrete wall and leave holes in the wall when they are removed, they are so widely spaced as to avoid structurally weakening the wall. The present invention provides means for locking those crossbars into the same unit which locks adjacent panels to one another. In this manner a single locking device may be used to lock adjacent panels to one another so as to form an elongated section and also lock opposed panels at a fixed spacing from one another. Since the horizontal spacing bar connect to a joinder point between adjacent panels, they provide support to both panels and distribute this support through the horizontally extending walers. This allows fewer horizontal rods to be employed and thereby results in a stronger and more continuous wall section.

The lock used to join the walers of adjacent panels and to receive the horizontal rod connection from the opposed wall panels is so simply designed as to be highly economical and reliable in its operation.

A preferred embodiment of the present invention which will subsequently be described in detail is utilized with walers having horizontally extending slots in their horizontal webs a short distance from each end. The lock takes the form of a channel section which has a pair of right angle tabs, each having one surface attached to a flange of the channel with its other face extending parallel to and spaced from the central web of the chan-

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nel. These angular tabs fit in a pair of slots in walers of adjacent wall panels. A wedge may be driven between the slot and the interior side of one of the tabs so as to draw the forms together until their plywood sections and edge vertical reinforcing wooden beams pressingly engage one another. The horizontally extending rods employed with the present invention have slots formed adjacent to each of their ends. These rods extend between the forms and pass through notches cut in the adjacent edges of a pair of forms and their vertically extending wooden edge member. A pair of slots in the flanges of the locking member allow a wedge to be passed from the outside of the locking member through the slot in the horizontal rod. This fixes the rod with respect to the locking member and also distributes the rigidity of the rod to the adjacent walers.

It is therefore seen to be an object of the present invention to provide a lock for adjacent concrete forms in the shape of a channel section having tabs which extend into slots near the edges of walers of adjacent forms and may be wedged so as to draw the forms together.

Another object is to provide a lock of the above type which provides means for engaging horizontal rods extending between pairs of wall panels.

Other objects, advantages, and applications of the present invention will be made apparent by the following detailed description of a preferred embodiment of the invention. The description makes reference to the accompanying drawings in which:

FIG. 1 is an elevation view of a section of a set of forms joined by the present locking means;

FIG. 2 is a plan view of a section of the forms shown in FIG. 1;

FIG. 3 is a side elevation view of the forms of FIG. 1;

FIGURE 4 is a front perspective view of a set of forms joined by the present locking means; and

FIGURE 5 is a rear perspective view of a portion of the forms and locking means shown in FIGURE 4.

As shown in the drawings, the forms are constructed about sheets of plywood or other light-weight board material 10. These sheets 10 are generally rectangular in form and are supported on the rear surface of their upper edges by wooden 2 x 4's 12. Similar horizontal members extend along the bottom edge of each of the panels but are not shown. The vertical edges of the panels are similarly supported by 2 x 4's 14 which meet the top members 12 at their ends. Other vertically extending reinforcing members similar to the end pieces 14 may extend along the board at regular intervals, but none are illustrated in the drawings.

Midway along the height of the form sections, a pair of right angle iron members generally indicated at 16 and 18 extend horizontally across each form member. The upper angle member, or waler, 16 has one of its flanges 20 extending horizontally within grooves in the vertical wooden beams 14 while its other flange 22 extends upwardly along the outer edge of the form. Similarly the lower wales 18 have their horizontal flanges 24 extending in grooves in the vertical members 14 and have their vertical flanges 26 extending downwardly along the outer edges of the forms.

In the section of wall illustrated in the drawings, two form sections generally indicated at 30 and 32 are joined together to form one side of the form while another pair of forms 34 and 36 are joined together in parallel opposing relationship to the sections 30 and 32.

The lock is formed of a length of channel section having an upper flange 40, a lower flange 42, and a central web 44. The upper and lower flanges 40 and 42 have chamfered edges as at 46 so that they taper and meet the web surface 44. A pair of right angle tabs 48 each

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have one of their edges welded to the upper flange 40 adjacent to its line of connection with the central web 44 and proximate to the opposite edges of the lock. The tabs 48 are welded in such a manner that their angular extensions project parallel to and spaced from the web 44. These flanges extend slightly more than half way across the height of the web 44.

The upper walers 16 have their horizontal flanges 20 formed with slots 50 which extend parallel to the vertical flanges 22 and spaced slightly away from them. The spacing of the slots 50 from the edges of the waler is such that the freely projecting portions of the tabs 48 may be extended into a pair of slots 50 in the walers of adjacent form sections. The tabs 48 are inserted in the slots 50 in such a manner as to bring the vertical flange 22 of the waler 16 into contact with the outer surface of the web 44 of the lock.

The slots 50 are of sufficient length that a wedge 48 may be driven into one of the slots 50 between the tab 48 and the edge of the slots closest to the end of the waler. This causes the two forms to be drawn together so that the edges of their facing surfaces 10 and their vertical edge members 14 abut on another and bear against each other.

The sets of forms 30 and 32 and 34 and 36 are maintained at a proper spacing from one another and supported against horizontally imposed forces by rods 54. One rod is associated with each set of locks 40 and although only one rod and set of locks is shown at least two must be employed in each vertical wall surface. The rod associated with a set of locks employed to join two forms in a corner section of the wall may also serve as the second support for a planar section. While such corner locks are not shown in this application, they are formed in accordance with the same principles as the central locks which are disclosed.

The rods 54 have a slight taper from one end to the other so that they may be withdrawn from the concrete wall after it is poured. Adjacent to each end, they have slots 62 which are each disposed in the same place. The rod passes through central holes in the webs 44 of the lock members and through mating notches formed in the wall sections 10 and the edge columns 14 of the forms.

The rods 54 are fixed with respect to the lock by tapered wedges 56 which pass through slots 58 and 60 formed in the upper and lower flanges 40 and 42 of the locks, respectively. The wedge are designed to pull the rods 54 outwardly with respect to the locks.

Having thus described my invention, I claim:

1. A concrete form and lock set, comprising:

forms including
coplanar, rectangular sheet surfaces,
beams attached to one side and extending along
each edge of the surfaces, and
metal walers attached to the same side of the surface as the beams and extending across the surfaces parallel to and intermediate two opposed edges thereof,

said walers having at least one flange extending perpendicularly to the surface and containing slots therein adjacent to each end of the waler,

said slots extending parallel to said surfaces;

lock members, channel shaped in cross section and having a pair of right angle tabs attached to opposite sides of one of its flange surfaces adjacent to the line of connection with the channel web, said tabs having free ends projecting parallel to and spaced from the web of the lock, perpendicular to the length of the lock, whereby the tabs may be inserted in the slots of the waler flanges of a pair of adjacent forms; and wedge means, operable in said waler slots for forcing the pair of adjacent forms toward one another.

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2. A concrete form and lock set, comprising: forms including

coplanar, rectangular sheet surfaces,
beams attached to one side and extending along each edge of the surfaces, and
metal walers, right angle in cross section, having one flange attached to the same side of the surface as the beams and the other flange extending perpendicularly to the surface, and extending across the surface parallel to and intermediate two opposed edges thereof,

slots formed in said perpendicular flange of the waler adjacent to the ends thereof,

said slots extending parallel to said surfaces;

lock members, channel shaped in cross section and having a pair of right angle, flat tabs attached to opposite sides of one of its flange surfaces adjacent to the line of connection with the channel web, said tabs having free ends projecting parallel to and spaced from the web of the lock, perpendicular to the length of the lock, whereby the tabs may be inserted in the slots of the waler flanges of a pair of adjacent forms; and wedge means, operable in said waler slots for forcing the pair of adjacent forms toward one another.

3. A concrete form and lock set, comprising: forms including

opposing sets of coplanar, rectangular sheet surfaces,

beams attached to one side and extending along each edge of the surfaces, said sheets and a pair of beams on opposed sides being notched, and metal walers attached to the same side of the surface as the beams and extending across the surfaces parallel to and intermediate two opposed edges thereof,

said walers having at least one flange extending perpendicularly to the surface and containing slots therein adjacent to both ends of the waler,

said slots extending parallel to said surfaces;

lock members, channel shaped in cross section having central slots in both its flanges and web, and a pair of right angle tabs attached to opposite sides of one of its flange surfaces adjacent to the line of connection with the channel web, said tabs having free ends projecting parallel to and spaced from the web of the lock, perpendicular to the length of the lock, whereby the tabs may be inserted in the slots of the waler flanges of a pair of adjacent forms;

wedge means, operable in said waler slots for forcing the pair of adjacent forms toward one another; a tapered rod, having slots adjacent both its ends, and operative to be passed through the notches in the sheets and beams and the slots in the webs of channel sections; and wedge members operative to pass through the slots in the flanges of a lock and a slot in an end of a rod, to fix the rod to the lock.

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