Sept. 4, 1923. 1,466,830

C. W. HAYWARD

FORM FOR CONCRETE CONSTRUCTION

Filed Oct. 28. 1922 2 Sheets-Sheet 1

Fig. 1.

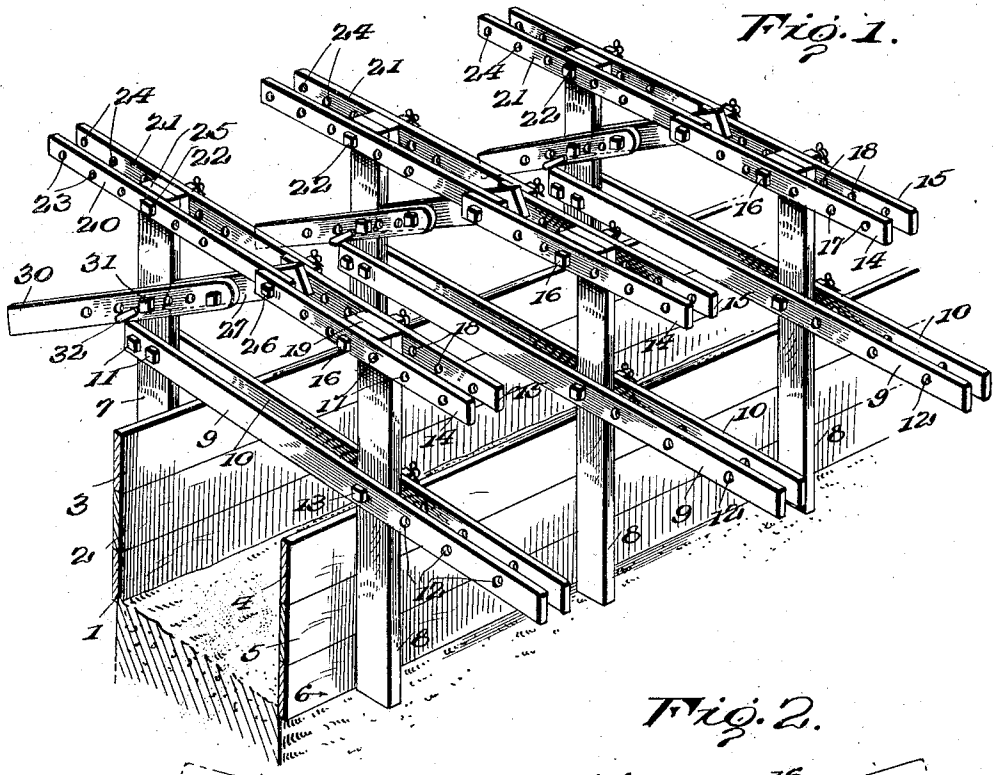
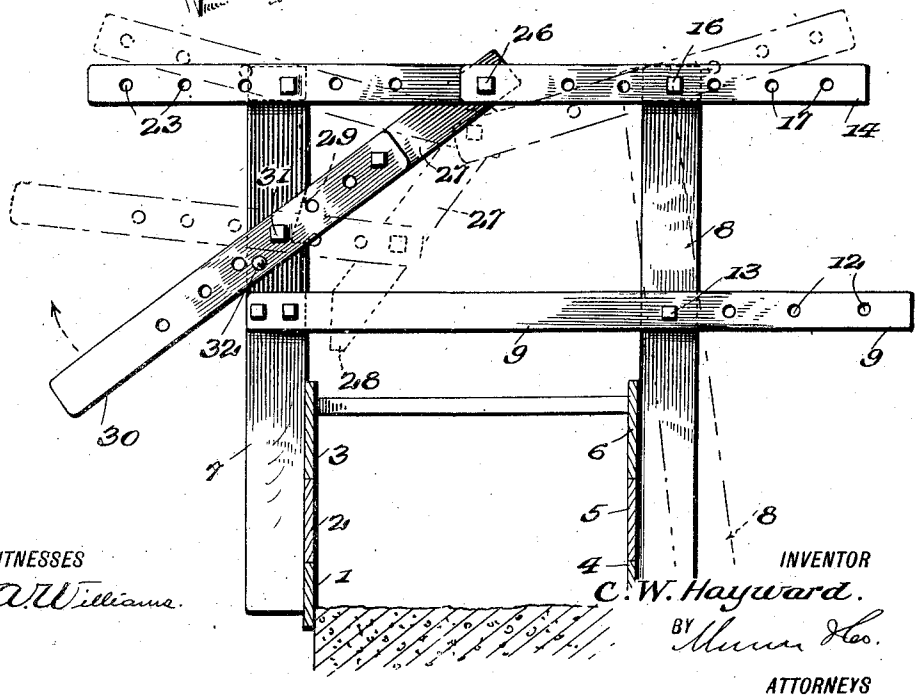


Fig. 2.



WITNESSES

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Fig. 3.

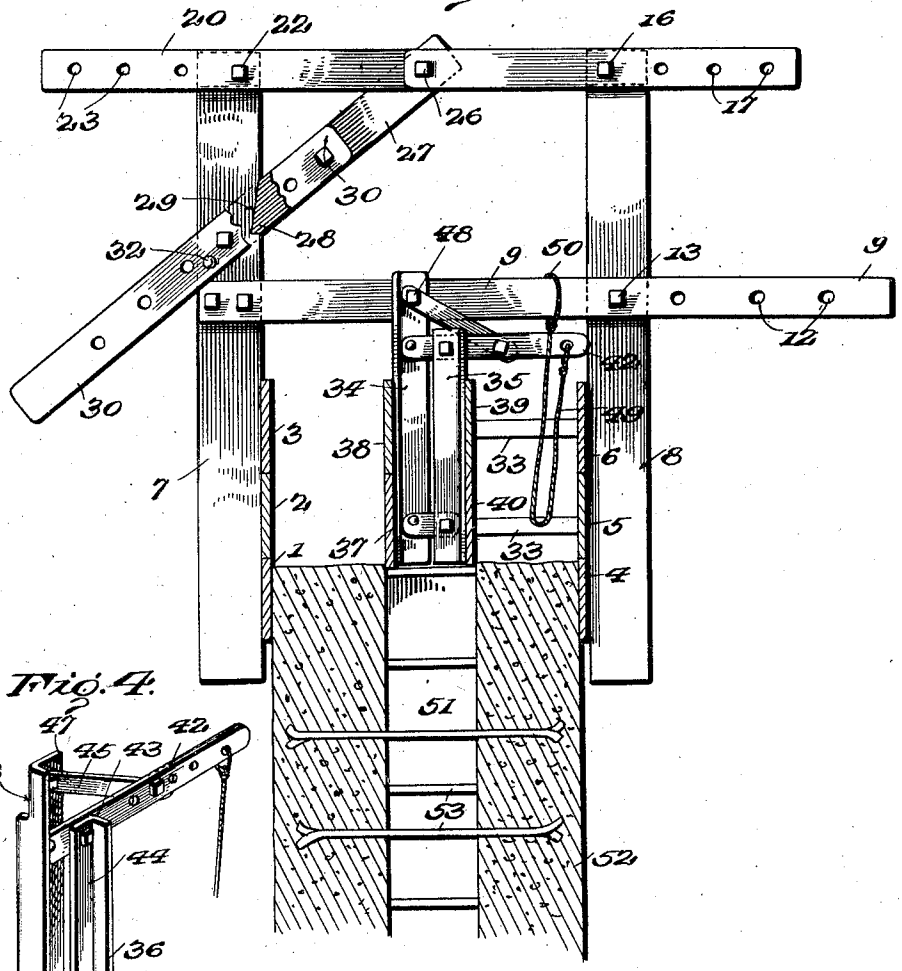
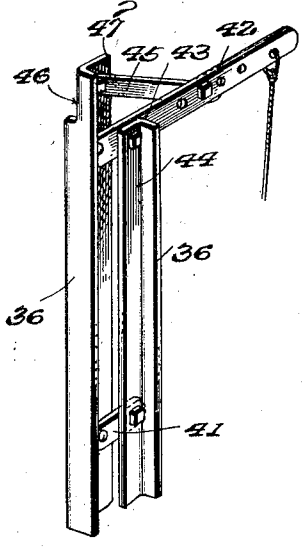


Fig. 4.



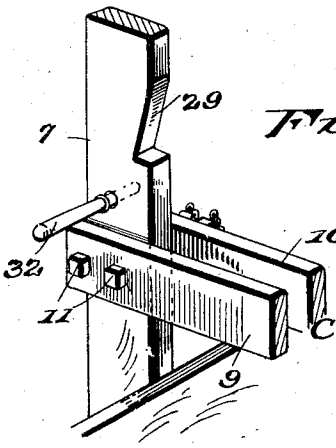


Fig. 5.

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UNITED STATES PATENT OFFICE.

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FORM FOR CONCRETE CONSTRUCTION.

Application filed October 28, 1922. Serial No. 597,607.

To all whom it may concern:

Be it known that I, CHARLES W. HAYWARD, a citizen of the United States, and a resident of Santa Barbara, in the county of Santa Barbara and State of California, have invented certain new and useful Improvements in Forms for Concrete Construction, of which the following is a specification.

This invention relates to a device to be employed in the construction of hollow or solid concrete walls.

It has been proposed in building concrete walls to provide a hollow form construction of boards, the interior dimensions of the form being equal to the dimension of the wall. Concrete is poured into this form, tamped, and then permitted to set. After a period, this form, which requires the use of a great deal of lumber and a considerable loss of time in its construction, is torn down.

It is an object of my invention to provide a device which will require very little lumber and time for its setting and which will furnish a form for continuously constructing a concrete wall whether hollow or solid and in which the wall may be progressively advanced in height by the repeated application of the given number of boards throughout various stages in the building of said wall.

A further object of my invention is the provision of a device for supporting a certain number of boards in spaced relation with the space between the boards being adapted to be filled with concrete to form a certain height of a wall whereby the supporting means and the boards may be removed and again spaced above the completed portion of the wall to provide a form in which more concrete is adapted to be poured for completing a second portion of the height. These operations may be continued until the wall is complete.

Another object of the invention is the provision of a device for supporting boards in position to furnish a form for a concrete mixture and which device may be readily removed from its supporting position and is further adjustable to support boards in various spaced relation to build walls of different thicknesses.

Other objects and advantages will be apparent during the course of the following description.

The invention is illustrated by way of example in the accompanying drawings, in which,

Figure 1 is a view in perspective of a form composed of a number of boards supported in spaced relation by my improved clamp.

Figure 2 is a side elevation of my clamp shown as supporting a plurality of boards in spaced relation.

Figure 3 is a side elevation of the clamp constructed in accordance with my invention for supporting boards in spaced relation at the opposite sides of a partly finished wall with an auxiliary clamp for supporting boards to form an air space within the wall.

Figure 4 is a view in perspective of the intermediate clamp for forming the air space.

Figure 5 is a fragmentary view in perspective disclosing the means for holding the legs of the clamp in a predetermined position.

Referring to the drawings, 1, 2 and 3 designate boards which are adapted to be spaced in vertical alinement with the opposite longitudinal side edges of the board 2 in engagement with the longitudinal side edge of the boards 1 and 3. A similar number of boards 4, 5 and 6 are spaced from these boards and mounted in vertical alinement and similarly to the positioning of the boards 1, 2 and 3. These boards are maintained in position by means of a plurality of clamping devices. Each clamp is provided with a leg 7 having its inner edge engaged with the outer surface of the alined boards 1, 2 and 3, and a movable leg 8 having its inner edge in engagement with the outer surface of the alined boards 4, 5 and 6.

A pair of bars 9 and 10 spaced by the legs 7 and 8 are adapted to have their outer ends secured to the leg 7 by means of the bolts 11 so that said bars have no movement relative to the leg 7. The other ends of the bars are provided with a plurality of perforations 12 adapted to be alined with the perforation in the leg 8 with the bolt 13 inserted through the alined perforations in the bars 9 and 10

and the leg 8 whereby the leg 8 is movable on the pivot bolt 13 relative to said bars. The perforations 12 are provided for spacing the legs 7 and 8 variously from each other to permit more or less spacing of the series of boards 1, 2, 3, and 4, 5, 6, whereby greater widths of walls may be constructed.

A pair of bars 14 and 15 are pivotally mounted on the bolt 16 which passes through one of the perforations 17 and 18, respectively, of the bars 14 and 15 when alined with a perforation in the upper end of the leg 8. A perforated spacing block 19 is located between the bar 14 and the adjacent face of the leg 8.

A similar pair of bars 20 and 21 are pivotally mounted at the upper end of the leg 7. A bolt 22 passes through one of the perforations 23 in the bar 20 and perforation 24 in the bar 21 and the perforation in the upper end of the leg 7 and a spacing block 25. The inner end of the pairs of bars 14, 15 and 20, 21 are connected together by means of a bolt 26.

Pivotally mounted on the bolt 26 and between the inner ends of the bars 20 and 15 is a link 27 having at its inner end a toe 28 adapted to engage a notch 29 formed on the inner edge of the leg 7. A lever 30 is pivotally mounted on a bolt 31 which passes through the leg 7. A pin 32 is adapted to be inserted through a perforation in the lever 30 and the leg 7 for locking the lever in position when the toe 28 of the link 27 is located within the notch 29 and when the legs 7 and 8 are maintained in parallel position for supporting the spaced boards 1, 2, 3 and 4, 5, 6. Temporary braces 33 are adapted to maintain the boards in spaced relation when the space between the boards is being filled with concrete. The braces are afterwards removed at the proper time.

In the operation of the device for maintaining the boards in spaced relation, the lever 30 is moved from the direction indicated by the arrow in Figure 2 to the position indicated in dotted lines when the inner end of the pair of bars 20, 21 and 14, 15 are moved downwardly and the toe 28 of the link 27 shifted from disengagement with the notch 29 and the leg 7. Since the outer ends of the bars 9 and 10 are rigidly connected with the leg 7 by means of the bolts 11 and the leg 8 is pivotally mounted on the bolt 13 passing through the bars 9 and 10, the lower end of the leg 8 will be moved outwardly to the position shown in dotted lines in Figure 2, while the leg 7 remains immovable as the lever 30 is moved in the direction indicated by the arrow. The spread-apart position of the legs 7 and 8 will permit the boards 1, 2, 3 and 4, 5, 6 to be inserted in position for building the wall. A reversal of the direction of movement of the lever 30 will cause the toe 28 to move upwardly and engage the notch 29 and lock the legs 7 and 8 in a parallel position for supporting the boards in spaced relation.

As shown in Figure 3, where a portion of the wall has been completed, the pair of lower boards 1 and 4 are first positioned adjacent the upper side edges of the partly completed wall. The clamping device is so positioned that the legs will straddle these boards in the wall. The lever 30 is oscillated to move the leg 8 inwardly toward the wall and thereby draw both legs up tight against the boards 1 and 4 and wedge the same in holding position against the wall. As shown in Figure 1 a number of these clamps are located in supported relation with the various boards and spaced from each other along the length of said boards.

Any number of boards may be employed with the clamps, but I prefer for convenience in use the three boards. These clamps may be constructed of any material suitable for the purpose, but as shown, the different parts of the device are made of wood.

In order to build a concrete wall which is hollow as shown in Figure 3, it is necessary to employ an auxiliary clamping means for supporting boards in spaced relation centrally of the spaced boards 1, 2, 3 and 4, 5, 6. For this purpose I employ a clamp constructed of a pair of T-irons 34 and 35 having heads 36 which are adapted to be positioned against the inner side of the boards 37, 38 and 39, 40. A link 41 having pivotal connection adjacent its ends with the members 34 and 35 at one end of the said members and a lever 42 having pivotal connection adjacent an end of said members are adapted to maintain the members 34 and 35 always in a parallel position. The oscillation of the lever 42 would tend to move the T-shaped members towards or away from each other. A portion of the head of the T-shaped member 35 is cut away as shown at 43 to permit the lever 42 to be placed in face to face engagement with the flange 44 of the member 35. A link 45 pivotally connected at one end to the member 34 and at its other end to the lever 42 is adapted to lock the lever 42 in position for maintaining the T-shaped members 34 and 35 predeterminedly spaced from each other for supporting the boards 37, 38 and 39, 40 from each other and centrally between the legs 7 and 8 of the first-mentioned clamping member. The T-shaped member 34 is cut away at 46 in order that the flange 47 of said member will be able to engage the bar 9 in face to face engagement while the pin 48 which connects the link 45 to the flange 47 of the T-shaped member 34 likewise pivotally connects the T-shaped member 34 to the transverse bar 9.

A chain 49 connected to the lever 42 is provided with a hook 50 adapted to engage over

the bar 9 in order to prevent the clamping member comprising the T-shaped members 34 and 35 from being lost within the space 51 of the hollow wall 52 when said clamping member is accidentally disengaged from its position and falls within the space 51. Reinforcing rods 53 are disposed transversely of the wall 52 with a portion as shown extending across the space 51.

It will be noted that the perforations formed in the parallel bars 9 and 10, which are formed adjacent the leg 8, provide for spacing the legs 7 and 8 at a greater distance apart to form walls of various widths. The perforations formed in the outer ends of the pairs of bars 14, 15 and 20, 21 are for a similar purpose. The positioning of the leg 8 farther away from the leg 7 by means of locating the bolts passing through the leg 8 in perforations close to the ends of the bars 9, 10 and 14, 15 will not effect the position or adjustment of the lever 30 and the link 27 since these members have their pivotal connections located within a certain relative position with respect to the leg 7. The link 45 is provided with a plurality of perforations whereby by positioning the bolt which connects the link to the lever 42 in any one of these perforations the T-shaped members 34 and 35 will be held in various spaced relations so that different widths of air spaces may be formed within a wall when this clamping member is employed in connection with a clamping member for supporting boards adapted to form the outer faces of the wall.

The clamping member which has the fixed leg 7 and the movable leg 8 may be employed for constructing the air passage in hollow walls instead of using the clamp provided with T-shaped members. In this case the bars 9 and 10 will be mounted at the ends of the legs 7 and 8 in place of the bars 14, 15 and 20, 21, while these last-mentioned bars will have their pivotal connections at a point where the bars 9 and 10 were formerly pivoted.

Of necessity the lever 30 and the link 27 will assume positions in accordance with the new positions of the bars 14, 15 and 20, 21.

What I claim is:

1. In a device of the character described, a leg provided with a notch, a pair of bars rigidly connected at an end to an intermediate portion of the leg, a movable leg pivotally mounted intermediate its ends between the pair of bars and adjacent the other end of said bars, a pair of bars pivotally mounted at the upper end of each leg with the inner ends of the last mentioned bars pivotally connected to one end of a link, said link provided with a wedge-shaped end adapted to engage the notch on the first mentioned leg, a lever pivotally mounted on said leg and pivotally connected with an intermediate portion of the link, said lever adapted when oscillated to oscillate the link and pairs of the second mentioned bars to lock the movable leg to clamping and unclamping position relative to an object, with the link being moved into and out of engagement with the notch in the fixed leg.

2. In a device of the character described, a leg provided with a notch, transverse bars rigidly connected with the leg, a movable leg pivotally connected with the bars and spaced from the first leg, and adjustable means connecting the upper ends of the legs, a link pivotally connected with the adjustable means and engageable with the notch, a lever pivoted on the first leg and having pivotal connections with the link for moving the link into engagement or out of engagement with the notch and for moving the lower end of the pivoted leg to or away from the first leg, in order that when the link is engaged with the notch, the movable leg will be locked in parallel relation with the first leg.

3. In a device of the class described comprising a leg, a movable leg spaced from the first leg, means connecting said legs intermediate their ends and providing a pivotal mounting for the movable leg, operating means for oscillating the movable leg, and means connected with the operating means for locking the legs in parallel relation, clamping means pivotally mounted upon the connecting means between the legs and depending therefrom, and cooperating with the legs of the first mentioned clamping means for maintaining pairs of timbers spaced from each other with the inner members of the spaced timbers spaced from each other.

4. In a device of the class described, a leg provided with a notch, transverse bars rigidly connected with the leg, a movable leg pivotally connected with the bars and spaced from the first leg, and adjustable means pivotally connecting the upper ends of the legs, a link pivotally connected with the adjustable means and engageable with the leg for locking the legs in parallel relation, a lever pivoted on the leg and having pivotal connection with the link for moving the link into locked or unlocked position with the first leg and causing oscillation of the movable leg through the link and the adjustable connecting means for the upper ends of the legs, a T-shaped member pivotally mounted between the legs and upon the transverse bars, a second T-shaped member, a link pivotally connecting the lower ends of the T-shaped members together, a lever pivotally connecting the upper ends of the T-shaped members and for moving the second T-shaped member relative to the first T-shaped member and in parallel relation whereby said

T-shaped members are caused to approach or move away from each other, and a link pivotally connecting the lever with the first mentioned T-shaped member for locking the lever in position and simultaneously locking the pair of T-shaped members in a fixed position relative to each other.

5. In a device of the class described comprising a leg, a movable leg spaced from the first leg, means connecting said legs intermediate their ends and providing a pivotal mounting for the movable leg, links pivotally connected to the upper end of the legs, a locking member having pivotal connections at one end with the free ends of the links, an operating lever pivotally mounted on the first mentioned leg with one of its free ends pivoted to the locking member intermediate its ends, the first mentioned leg being provided with a notch adapted to be engaged by the free end of the locking member for locking the legs in parallel relation, operation of the lever being adapted to lift the locking member out of engagement with the notch and swing the free end of the movable leg out of parallel relation with the first mentioned leg.

CHARLES W. HAYWARD.