Apr. 24, 1923. 1,452,751

A. H. NELSON

CONCRETE WALL CONSTRUCTION

Filed Sept. 17, 1921 2 Sheets-Sheet 1

Fig. 1.

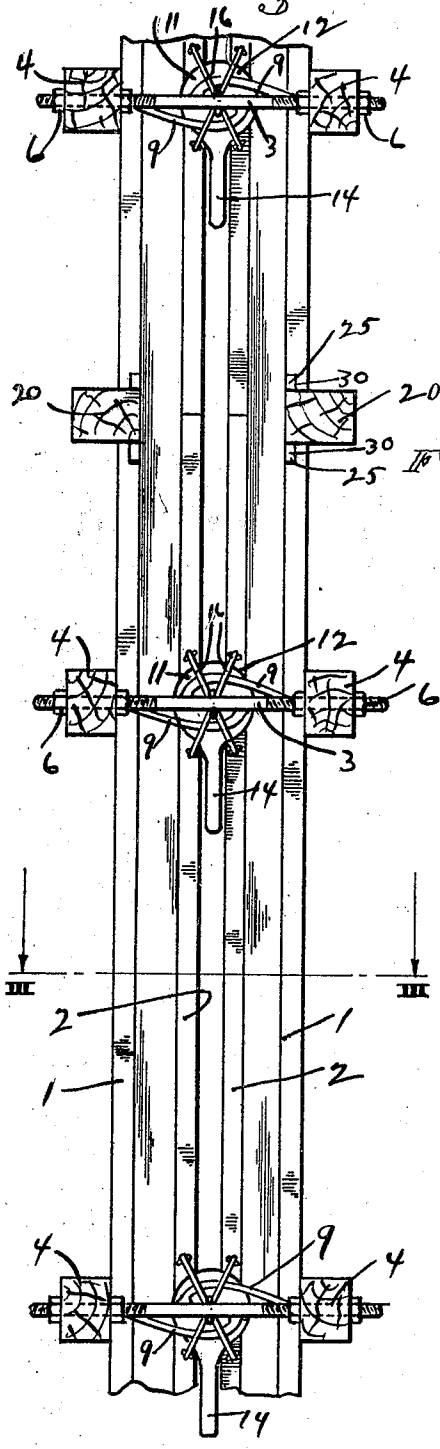


Fig. 2.

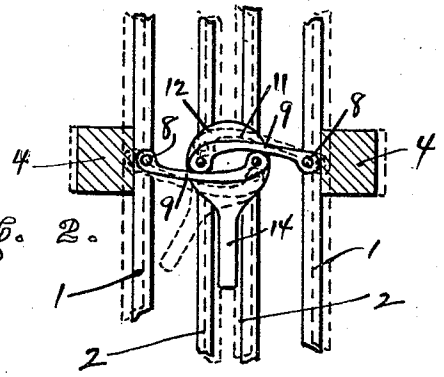
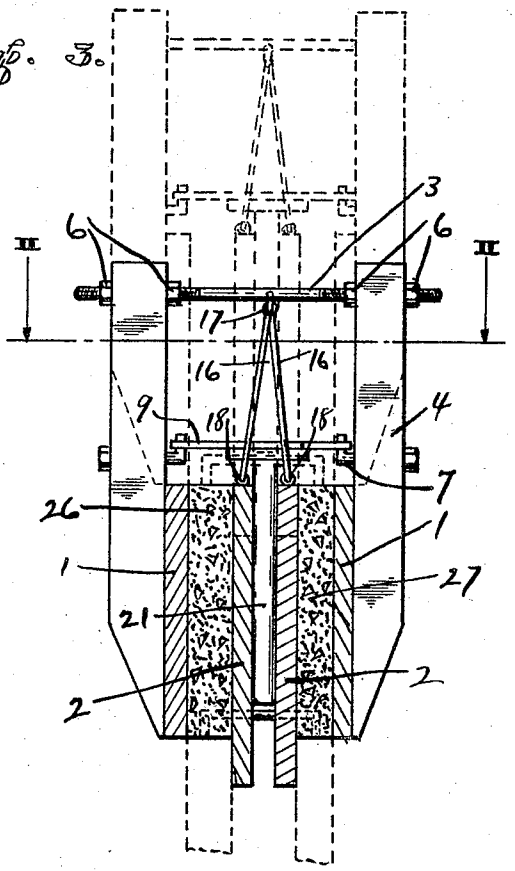


Fig. 3.



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Fig. 4.

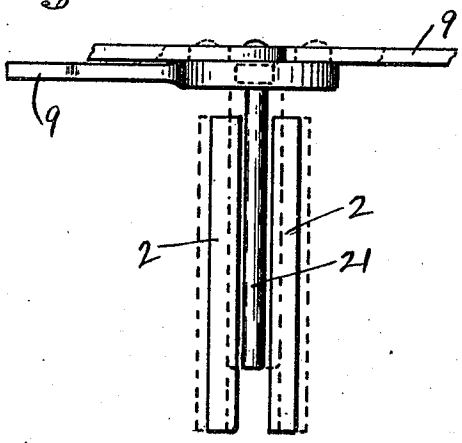


Fig. 5.

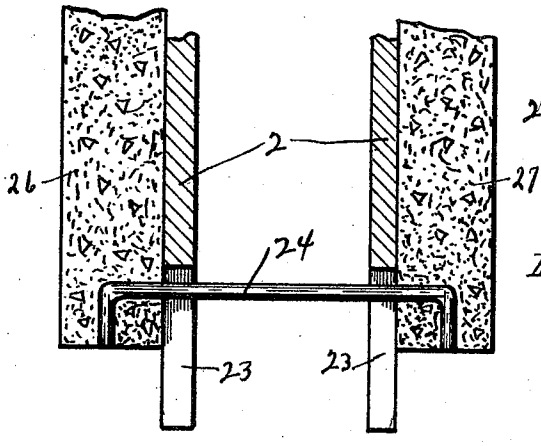


Fig. 6.

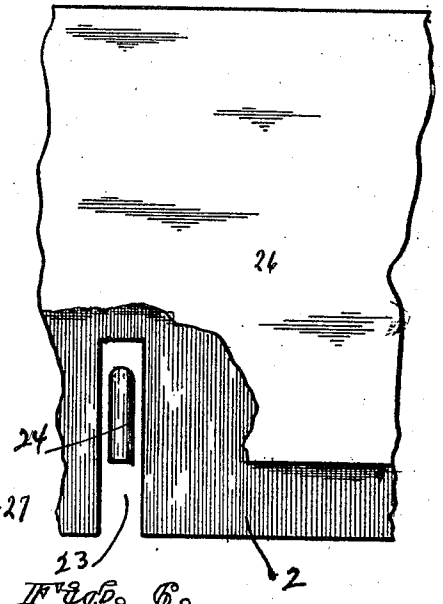
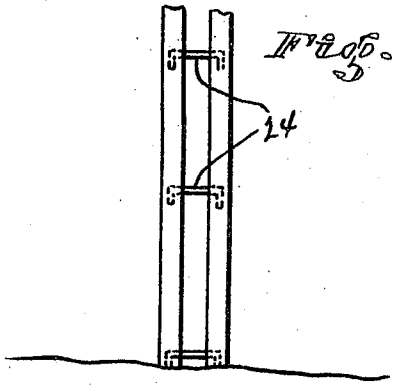


Fig. 7.



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UNITED STATES PATENT OFFICE.

AXEL HERMAN NELSON, OF TURLOCK, CALIFORNIA.

CONCRETE-WALL CONSTRUCTION.

Application filed September 17, 1921. Serial No. 501,378.

To all whom it may concern:

Be it known that I, AXEL HERMAN NELSON, a citizen of the United States, and resident of Turlock, county of Stanislaus, and State of California, have invented a new and useful Concrete-Wall Construction, of which the following is a specification.

The present invention relates to improvements in concrete wall construction and its principal object is to provide a convenient means for constructing a hollow concrete wall. A further object of the invention is to provide a form by means of which the wall may be constructed stepwise. A further object is to provide means whereby during the stepwise construction of the wall reinforcing members holding the walls in spaced relation may be introduced without in any manner interfering with the proper operation of the forms.

The preferred form of my invention is illustrated in the accompanying drawing, but I wish to have it understood that changes and modifications may be made as to the details of construction without affecting the spirit of the invention.

In the drawings Figure 1 is a top plan view of a portion of my form as it appears when in operation; Figure 2 is a horizontal cross section along line 2—2 of Figure 3; Figure 3 is a vertical cross section along line 3—3 of Figure 1; Figure 4 illustrates an end view and the interior portion of my form; Figure 5 is a side view of the wall with a portion of the concrete shown broken away; Figure 6 is an enlarged detail view showing the disposal of the reinforcing members connecting the two walls, and Figure 7 is an end view of the wall as it appears when finished.

Referring to the drawings in detail, it will be seen that my form consists of two exterior members (1) and two interior members (2). It may be mentioned that in ordinary practice I would use for the exterior members planks about 1½″ thick and 12″ wide, while for the interior members I would use planks somewhat thinner but about 2″ wider so that the interior members would project downwardly over the exterior members by a few inches. The exterior members are spaced apart the full width of the contemplated wall and are held in spaced relation to each other by means of cross bars (3) engaging the uprights (4), secured to the planks in any desired manner and projecting above the planks as shown in Figure 3. The cross bars (3) are secured between these uprights by means of screws (6) adapted to be received on the threaded ends of the cross bar. The fit between the screws and the uprights is made sufficiently loose so as to allow a certain amount of play. These uprights are further provided with hooks (7) one being secured in each upright a small distance above the plank (1), and the two hooks being adapted to receive the eyes (8) at the outer ends of levers (9); the inner ends of said levers being pivotally secured on the body portion (11) of a pan-shaped member (12), the handle (14) of which extends parallel to the members (1). The two levers co-operate with the pan shaped member in such a manner that upon turning the handle to the left as indicated in dotted lines in Figure 2 the levers press the exterior members (1) apart, while on the return of the handle to its longitudinal position the exterior members (1) are drawn together. The interior members (2) normally depend from the bar (3) and are secured to the same, as shown in Figure 3, by means of rods (16) pivotally secured to the cross bar (3), as shown at (17), and pivotally secured to the tops of the interior members (2), as shown at (18). These two interior members are held in spaced relation to each other by means of flattened rods (21) which extend downwardly from the member (12) in such a manner that the flat portion of the same runs transversely to the handle (14). It will thus be seen that when the handle (14) is in the longitudinal position indicated in full lines in Figure 2, the rod (21) forces its widest extension between the interior members so as to spread the same apart, while on turning the handle (14) into the dotted line position in Figure 2 the rod will be turned around so as to present its flattened portion between the two interior members (2), and to allow the two latter members to collapse toward each other.

The two interior members are provided in their lower portions with registering slots (23) which are adapted to receive reinforcing members (24) designed to bind the two walls together, as shown particularly well in Figure 6.

In actual operation my device is used as follows: Assuming for the sake of simplicity that it is desired to put up a single wall several times the length of a unit of form, which latter is necessarily held within con-

venient limits, say about 12 feet. I first erect a number of uprights, only one pair of which is shown at (20), spaced in such a manner that the wall may be received between the same and provided with suitable strips (25) adapted to receive corresponding recesses (30) in the ends of the outer planks (1), which prevent the latter from collapsing inwardly. My exterior members (1) are placed between the uprights in such a manner that the inner sides of the members (1) are flush with the inside of the uprights. The entire form is supported by means of blocks and tackle not shown in the drawing and suspended from upper horizontal frame members. In their natural position the exterior frame members (1) will loosely depend from the bar (3) and the interior members (2) will in the same manner be suspended from the pivot (17) of the bar (3). The flat rod (21) or a plurality of the same are then introduced between the two interior members and the links (9) are connected to the hooks (7). The handle (14) is then pressed into the longitudinal direction shown in full lines in Figure 2. This has a double effect. In the first place the interior members (2) are forced apart and secondly the exterior members (1) are drawn together. In this position all the form members occupy a vertical position and the concrete may now be filled into the spaces (26) and (27), each of which is enclosed by one exterior and one interior member, while the space between the interior members is left unoccupied. In this condition the concrete is allowed to set.

After the cement is hardened sufficiently to stand without support, the handles (14) are turned into the position indicated by the dotted lines in Figure 2, whereby the exterior members are forced apart, while the interior members are allowed to collapse due to the fact that the flattened rod is turned. A hoist may now be employed to lift the form sufficiently high to clear the lower extremities of the exterior members (1) from the concrete. In this position a number of reinforcing members (24) are inserted into the slots (23) of the interior members so as to extend into both parts of that section of the wall to be constructed during the next operation. Then the form is dropped again so that the lower extremities of the outer members extend somewhat below the top of the wall previously constructed and the handles (14) are turned into their longitudinal position again whereby the interior members (2) are pressed apart while the exterior members (1) are drawn together. The spaces (26) and (27) are filled with cement again and this operation is repeated until a wall of the desired height is constructed.

While in my description I have referred to a single unit being operated in the construction of a comparatively short wall, it is evident that a plurality of units may cooperate in the construction of an entire building and that the operations may be timed in such a manner that the crew can begin at one end of the building and work around the whole building to find the concrete at the place of beginning sufficiently set to start with the next layer.

I claim:

1. A form for constructing a hollow concrete wall, comprising a set of exterior planks having uprights extending therefrom, a rod for joining corresponding uprights at the top in spaced relation, a set of interior planks loosely supported between the exterior planks, and a lever having two links associated therewith engaging corresponding uprights at a lower point for forcing the same apart or together, and means associated with the lever for simultaneously actuating the interior planks in an opposite sense.

2. A form for constructing a hollow concrete wall, comprising a set of exterior planks having uprights extending therefrom, a rod for joining corresponding uprights at the top in spaced relation, a set of interior planks loosely supported between the exterior planks, and a lever having two links associated therewith engaging corresponding uprights at a lower point for forcing the same apart or together, and a cam member extending downwardly from the lever for actuating the interior planks in an opposite sense.

3. In a device of the character described, means for spacing two form members comprising two links pivotally engaging the form members in corresponding places and extending inwardly, a lever disposed with its fulcrum between the two points of engagement and means for engaging the inner ends of the links with the lever at points diametrically opposite one another relative to the fulcrum.

4. In a device of the character described, means for spacing two form members comprising two curved links pivotally engaging the form members in corresponding places and extending inwardly, a lever disposed with its fulcrum between the two points of engagement, and means for engaging the inner ends of the links with the lever so that the links passing around the fulcrum are locked on the center line when the lever is in its form holding position.

5. In a device of the character described, means for simultaneously spacing an inner set and an outer set of form members, comprising two links pivotally engaging the outer form members in corresponding places and extending inwardly, a lever disposed with its fulcrum between the two points of

engagement, means for engaging the inner ends of the links with the lever at points diametrically opposite one another relative to the fulcrum, and a cam member extending downwardly from the lever between the inner form members for spacing the same in a direction opposite to that of the outer members.

6. In a device of the character described, means for simultaneously spacing an inner set and an outer set of form members, comprising two curved links pivotally engaging the outer form members in corresponding places and extending inwardly, a lever disposed with its fulcrum between the two points of engagement, means for engaging the inner ends of the links with the lever so that the links passing around the fulcrum are locked on the centerline when the lever is in its form holding position, and a cam member extending downwardly from the lever between the inner form members for spacing the same in a direction opposite to that of the outer members.

AXEL HERMAN NELSON.