Nov. 20, 1923 1,474,659

W. E. WHITE

CONCRETE FORM AND SUPPORT

Filed Dec. 2, 1921

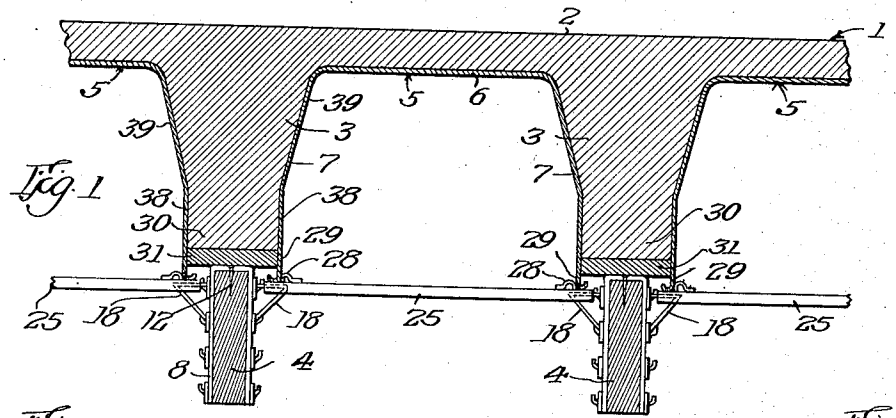


Fig. 1

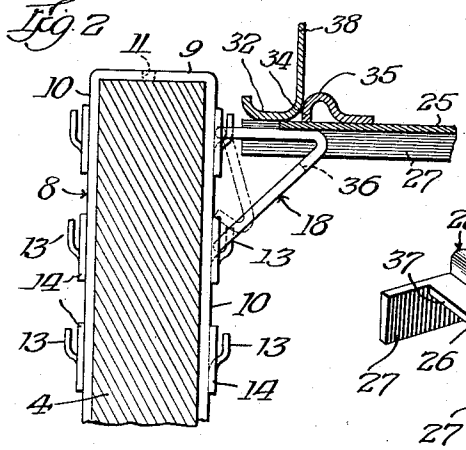


Fig. 2

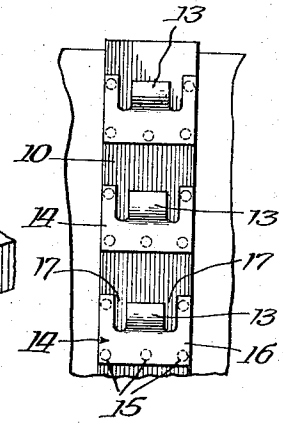


Fig. 3

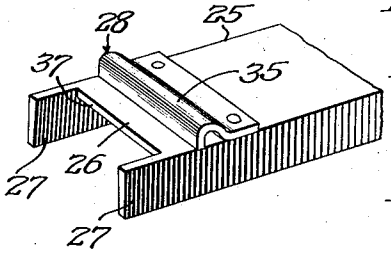


Fig. 5.

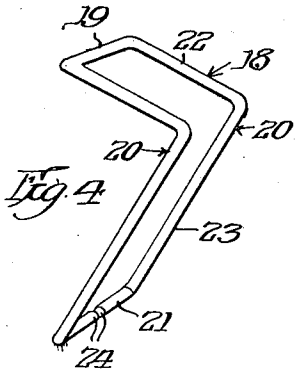


Fig. 4

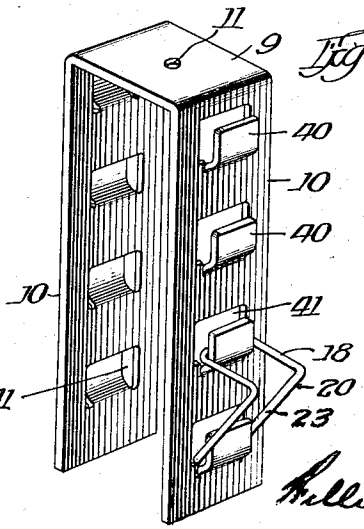


Fig. 6

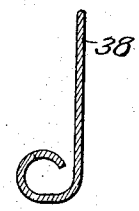


Fig. 7

Witness:

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UNITED STATES PATENT OFFICE.

WILLIAM E. WHITE, OF CHICAGO, ILLINOIS.

CONCRETE FORM AND SUPPORT.

Application filed December 2, 1921. Serial No. 519,373.

To all whom it may concern:

Be it known that I, WILLIAM E. WHITE, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Concrete Forms and Supports, of which the following is a specification.

My invention relates to improvements in forms and supports for the production of concrete floors and has special reference to supports for what are known as form pans used in such work. A similar construction is shown in my co-pending application Ser. No. 519,374, filed Dec. 2, 1921, in which application this construction is broadly claimed.

The object of my invention is to provide supports of such character and assembly that they and the pans can readily be assembled into position from the top of the false work with which they are used; and which shall be capable of being readily and easily taken down from beneath the finished concrete floor by the removal of parts or devices which are readily destructible.

It is a further object of my invention to provide the supports with what might be aptly termed "key members" which are insignificant as to cost, which can be readily and easily cut or destroyed and when once destroyed the parts of which are readily removable and thus permitting the ready removal of other and more stable part and devices.

It is a further object of my invention to provide the destructible parts of such character that it shall be cheaper to destroy them, using new parts on each job, than it would be to attempt to preserve them for future use.

It is a further object of my invention to provide supports for the purpose named which will materially reduce the labor cost of assembling forms in position for a concrete floor; which can readily be assembled from the top of the false work and which can be easily removed when the floor is finished.

My invention resides in supports for concrete forms which supports include an essential element capable of ready destruction and which when destroyed unlocks the other parts or members and permits their ready removal.

My invention will be more readily understood by reference to the accompanying drawings forming part of this specification, and in which:

Figure 1 is a vertical sectional view of a concrete floor shown in process of construction with the false work supports and forms in place;

Figure 2 is an enlarged sectional view of one of the temporary joists and supports;

Figure 3 is a fragmentary side elevation of one of the strap hangers forming part of my support;

Figure 4 is a perspective view of a wire bracket forming the destructible element of my support;

Figure 5 is a fragmentary perspective view of one end of one of the support bars;

Figure 6 is a perspective view of a modified form of strap hanger; and

Figure 7 is a fragmentary view showing a slightly modified form of the lower edge of the pan.

In said drawings 1 represents the concrete floor to be produced consisting of a horizontal top slab 2 and parallel depending integral ribs or beams 3. The beams are spaced apart horizontally of the floor portion 2. For building such a floor joists 4 are provided which are supported in position on edge on suitable false work not shown. One of the joists 4 is arranged centrally beneath each of the beams 3 to be produced. For producing the beam-like members 3 I use forms 5 which I make of sheet metal and each of which consists of a top portion 6 and depending side portions 7. These forms are arranged between adjacent joists and project upwardly above the upper edges of the joists to produce the spaces between the depending beams 3.

While some features of my invention relate to the specific shape of the pans 5 my invention has to do more particularly with means for removably supporting the pans 5 in position at suitable heights to produce the depth of beams desired. For the purpose of supporting the pans 5 in position, I provide strap hangers 8 of U-shape and adapted to

be hung upon the joists 4. These hangers are spaced longitudinally of the joists at suitable distances for properly supporting the pans 5. Each hanger 8 is made of a strap of sheet metal bent into U-shape, as best shown in Figure 2, having a top part 9 and depending legs 10. The legs are spread apart sufficiently to properly straddle the joists on which the hangers are to be used and the top portion 9 rests upon the upper edge of the joists. I preferably provide the top part 9 of each hanger with a central hole 11 through which a nail 12 can be driven into the upper edge of the joist to hold the hanger in position. I provide each leg 10 with a plurality of hooks 13 preferably formed by securing to the outer face of the leg, a suitable hooked member 14 either by rivets 15 or by spot welding to the hanger. Each hook 13 comprises a base portion 16 adapted to contact with the outer face of the leg 10 and formed to provide two openings 17 extending downwardly from the upper edge of the plate, separated by the hook 13 which is offset outwardly from the base 16. I provide a plurality of these hooks 13 on each leg of each hanger 8, spaced vertically at regular intervals, the function of these hooks being to receive and hold brackets 18 preferably made of wire. Each bracket 18 is made in the form of an elongated loop as best shown in Figure 4 comprising an upper end or bar 19, parallel side parts 20, and a lower end or bar 21. The sides 20 are spaced apart so that the upper end 19 can readily be placed under one of the hooks 13, the side bars 20 of the bracket projecting through the slots 17 at the sides of the hook 13. The sides 20 are bent between their ends to provide a horizontal portion 22 and a downwardly and inwardly inclined portion 23. The bracket is of a suitable length so that when the upper end 19 is engaged with one of the hooks 13, the lower end 21 can be engaged with the next lower hook 13 as best shown in Figure 2. The ends 24 of the wire of which the bracket 18 is formed, are brought together at the middle of the lower end 21 and as the lower end enters into the space in the base 16 this lower end is prevented from spreading by the side parts of the member 14.

For supporting the pan 5, I arrange the brackets 18 on the hangers 8 at the height desired, as best shown in Figure 1, the hangers on adjacent joists being arranged in transverse alinement. Upon the opposed brackets 18 I arrange a transverse support bar 25, this support preferably being in the form of a channel member having a top web part 26 and depending side flanges 27. The channel is of a suitable width so that the brackets 18 can be received between the flanges 27 and the web portion 26 rests upon the upper horizontal parts 22 of the brackets. The length of the support member 25 is slightly less than the normal spacing of the opposite hook parts 13 to allow for slight variations in the spacing of the joists. Upon the upper face or back of each channel support member 25 I secure or form two stop shoulders or knees 28 spaced apart so as to fit in between the lower edges 29 of the pans 5, as best shown in Figure 2.

Usually the lower edges 30 of the beams 3 are wider than the thickness of the joists 4 and I hold the lower edges 29 properly spaced and in contact with the stop shoulders 28 on the support bars 25 by means of horizontal wooden members 31 which are adapted to be forced downwardly between the sides of the adjacent pans and are adapted to rest upon the tops of the hangers 8 on the joists 4.

Preferably I bend the extreme lower edges 32 of the sides of the pans outwardly and upwardly to form more or less rounded edges on the pans and to provide drain grooves for catching and retaining any cement water which may leak through between the sides of the pan and the edges of the strips 31. In assembling the pans and supports, the joists 4 are arranged in suitable spaced relation, the hangers being secured thereon before the joists are raised to position or they can be placed and secured on the joists after they are in position. The joists and hangers being in position, the wire brackets are then arranged at the proper heights on the hooks 13 and then the transverse support bars 25 are placed on the hooks, thereafter the pans or forms 5 are placed in position, the rounded lower corners 34 on the pans and the rounded upper parts 35 on the shoulders 28 assisting in the proper positioning of the pans in an obvious manner. Thereafter the strips 31 are forced down between the adjacent pans, the arrangement preferably being that the strips fit tightly between the sides of the pans and force the lower edges of the pans against the shoulders 28 on the support bars 25.

It will be understood that all this work of arranging the several parts in position is accomplished from the top or upper surface of the false work comprising the joists 4 and their supports and that there is no necessity of any work being done from beneath. After the pans have been wedged into position on the supports as described, the concrete is filled in to form the beams 3 and the floor 2 and the whole remains in such position until the concrete has set. In constructing the floor as described, the next step is to remove the forms, the false work remaining in position until the floor has hardened sufficiently to properly support itself. To accomplish this, it is merely necessary to cut the lower members 23 of the wire brackets 20 at the points 36 as high as possible on the inclined lower portion 23. As these brackets

are made of wire which is substantially an eighth of an inch in diameter they can be readily cut by means of suitable wire cutters and then the lower ends can be readily be removed to permit the upper parts to drop down, as shown in dotted lines in Figure 2. Thereafter, the upper portions of the brackets can readily be lifted off of the upper hooks 13 especially as I preferably cut away the web 26 of the support bar 25 at its ends forming openings 37 between the side flanges at each end of this member through which these upper portions of the brackets can be raised and removed. When the wire brackets are removed the support bars 25 can be readily dropped down. Having removed the supports 25, the pans 5 are removed in the ordinary manner by freeing them from the concrete, they having preferably been first oiled on their outer surfaces before the concrete was poured. But in any event they are not ordinarily free enough of the concrete to inadvertently drop down upon the workmen but must be forcibly removed from their positions. Having removed the pans 5, the false work consisting of the joists 4 and their supports and the strips 31 are readily removed in the usual manner.

It is obvious that by placing the brackets 18 at different heights on the hangers 8 I can raise or lower the pans 5 to make the beams of different depths depending on what is desired.

In Figure 1 I have shown the beams as being of maximum depth and it is obvious that if the brackets 18 were placed lower on the hangers the beams 3 would be of less height. Preferably I make the lower portions 38 of the sides 7 of the pans 5 parallel with each other so that the strips 31 properly fit between the sides of adjacent pans regardless of the height of the pan, that is, within the limits of the support devices. The upper portions 39 of the sides of the pans are inclined inwardly thus producing the wedge form of beam desired and also permitting the easy forcing of the strips 31 down between the sides of adjacent pans. The strips 31 are preferably made of such width that they will, when placed into position, force the sides of the pans tightly against the shoulders 28.

Instead of forming the hooks 13 as described, that is attaching hooked plates to the legs 10 of the hangers 8, I may form the hooks as integral parts of the hangers, striking up the hooks as shown at 40 out of the side legs 10 and providing at the sides of the hooks spaces or slots 41 so that the wire brackets can be placed in position as described hereinbefore. While this form of hanger is somewhat cheaper than the form before described, I prefer the form in which the hooks are made by attaching hooked plates to the bracket, for the reason that the lower ends 21 of the wire brackets find solid abutments on the legs of the brackets.

As many modifications of my invention will readily suggest themselves to one skilled in the art, I do not limit or confine my invention to the specific details of construction herein illustrated and described, such being merely typical of my invention.

I claim:

1. In support means for forms for the production of a concrete floor and the like having parallel concrete beams on its under side, form pans for producing said beams, means for supporting the pans in position comprising hangers adapted to be supported on temporary joists arranged beneath said beams, spacer bars adapted to span from joist to joist, and destructible metallic bar-support elements adapted to be supported on the hangers, the spacer bars arranged to support the pans, the destruction of the metallic support elements permitting the free removal of said bars and the pans, as and for the purpose specified.

2. In a system of forms for the production of a concrete floor having parallel concrete beams on its under side, open bottomed form pans for producing the beams, hangers adapted to be supported on false work joists beneath said beams, hooked projections on the sides of the hangers, wire support members for engagement with the hooks, bars adapted to span from beam to beam and to be supported at their ends on said wire members and said pans adapted to be supported on said bars, the destruction of said wire members permitting the free removal of the bars and the pans.

3. In concrete form supports of the kind described, temporary destructible support brackets, a channel shaped support bar adapted to rest at its ends on opposed brackets, the web of the bar cut away at its ends to facilitate the removal of the bar after the destruction of the brackets, as and for the purpose specified.

4. In a concrete form support for open bottomed form pans, transverse bars for supporting the pans, the bars having shoulders adjacent to their ends for holding the pans against transverse collapse and means for temporarily holding the bars in place.

5. In a concrete form of the character described for the production of a concrete floor having parallel concrete beams on its under side, open bottomed U-shaped pans for producing the beams, metallic hooked hangers adapted to rest upon temporary joists arranged beneath the beams, easily removable metallic support elements engaging said hangers, transversely extending support bars resting at their ends on said removable supports, shoulders on said bars for holding the lower edges of the pans properly spaced and strips for placement on the tops of the

joists and between the sides of adjacent pans for forcing the sides of the pans tightly against said shoulders.

6. In sheet metal forms for concrete work, open bottomed U-shaped pans, removable means for supporting the pans in position, the side edges of the pans being turned outwardly and upwardly to form rounded stiffened edges on the pans capable of catching and holding seepage.

Signed at Chicago, Illinois, this 28th day of November, 1921.

WILLIAM E. WHITE.