May 28, 1940. C. DELL ET AL 2,202,096

TEMPORARY BEAM FOR BUILDING CONSTRUCTION

Filed June 23, 1937

Fig. 1.

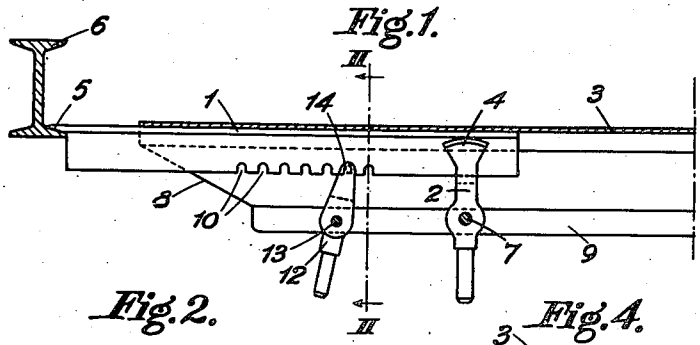


Fig. 2.

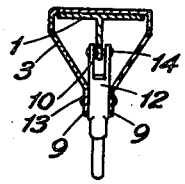


Fig. 4.

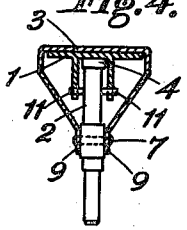


Fig. 3.

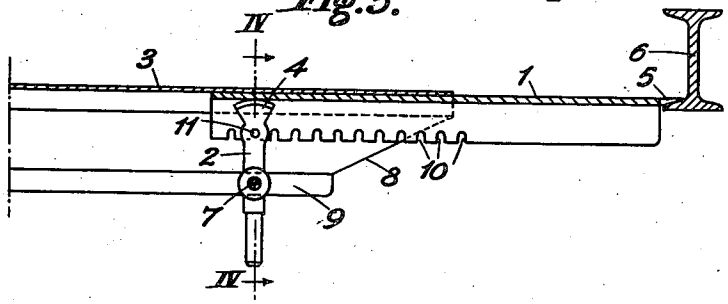
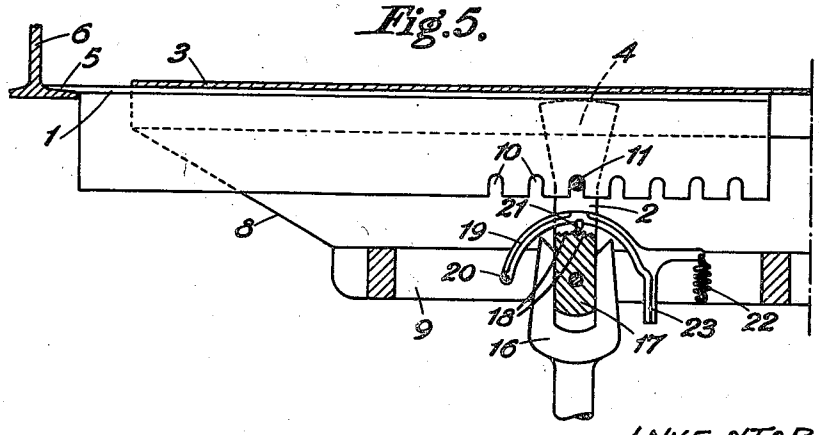


Fig. 5.



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TEMPORARY BEAM FOR BUILDING CONSTRUCTION

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7 Claims. (Cl. 189—37)

This invention relates to an improved extendible beam or like temporary support for use in building construction.

In building construction it is well known to employ extendible supports as centering, shuttering and scaffolding, and also as a means of erecting temporary bridging, roofing, staging, and the like. Such supports are commonly used in the construction of concrete floors, whether made of preformed blocks which have to be supported whilst the concrete sets which unites them, or cast in situ, the supports forming a bridge spanning the main supports with their one or more extendible portions resting on the supports or brackets thereon so as to be capable of being withdrawn after the concrete has set.

According to the invention the extendible support consists of a main beam having means for adjusting its length including one or more loose end pieces and a device for applying pressure to hold each end piece in rigid alignment with the beam when the said end piece has been adjusted the desired amount.

The invention provides therefore a construction which is an improvement over and distinguished from the known type of telescopic support wherein the end portions are a close sliding fit in the main beam, so as to prevent sagging, and require frequent cleaning and oiling to ensure easy manipulation, inasmuch that the improved construction with the normally loose end pieces allows the same to be more easily adjusted, eliminates the necessity for cleaning and oiling, and is unaffected by the ordinary risks of practical use, whilst giving a rigid support when the end pieces are held in their aligned position with the main beam. Moreover, by reason of the looseness of the end pieces which allows them to sag or collapse in relation to the main beam when the pressure is released, the improved support has the advantage that it can be placed under existing floors to support the weight during alteration or repair work.

Each loose end piece terminates in a projecting lip which in the construction of a concrete floor, rests on the main support, and it is one of the features of the invention that each end piece can be made reversible by providing such a lip at each extremity of the end piece. Such lips may be of different lengths to provide a vernier-like adjustment of the overall length of the support.

The extendible support according to the invention may include a member separate from the pressure applying device for (1) advancing the end piece after adjustment and before pressure is applied thereto an amount sufficient to engage the lip with the main support, or (2) for withdrawing the said lip from its engaging position to allow the beam to be taken down.

Alternatively, the device which applies the pressure to hold each end piece in rigid alignment with the main beam, may be constructed so that it can be used to extend the end piece from the beam a predetermined amount before applying the said pressure. The amount which the end piece is advanced from the main beam will be at least sufficient to allow the projecting lip to be wholly withdrawn from the main wall when the support is to be dismantled. Thus it will be seen that in use, the length of the support is first roughly adjusted to the required span, by manually setting the end piece or pieces to extend a certain amount from the main beam, and when placing the support between the main supports across which the floor is to be constructed, each piece is advanced further the said predetermined amount to engage the associated projecting lip on the adjacent main support, whilst at the same time pressure is applied to hold the end piece in rigid alignment with the main beam.

Various embodiments of one form of the invention will now be described with reference to the accompanying drawing, wherein:

Figure 1 is a longitudinal sectional elevation of one embodiment, wherein a separate member is provided for advancing the end piece after rough adjustment and prior to the pressure applying device being operated to hold the end piece in rigid alignment with the beam,

Figure 2 is a cross section on the line II—II of Figure 1,

Figure 3 is a longitudinal sectional elevation of a second embodiment wherein the pressure applying device is also utilized for advancing the end piece after its rough adjustment,

Figure 4 is a cross section on the line IV—IV of Figure 3, and

Figure 5 is a longitudinal sectional elevation of a third embodiment wherein the pressure applying device functions similarly to that in Figures 3 and 4.

In the drawing like reference numerals denote like or similar parts.

In the form of the invention shown, the device for applying pressure to each loose end piece 1 consists of a lever 2 which is pivoted on the main beam 3 with its inner end 4 disposed under the end piece so that as the lever is turned it

lifts the end piece and presses it hard against the top flange of the beam. Thus the end piece becomes rigid with the said flange and forms a continuation thereof, as illustrated in the drawing. The outer end of each end piece terminates in a lip 5 which rests on the flange of the main support beam 6.

Conveniently, the main beam consists of a metal pressing of channel section, with the lever pivoted at 7 between the limbs of the U and near the end of the beam. In this construction each end piece is loosely mounted within the channel, and comprises a metal plate which can be pressed by the lever hard up against the bight of the U forming the top or supporting flange of the beam. For preference the ends of the channel beam are inclined as at 8 so that the bottom edges are shorter than the top or supporting flange, the pivot of each pressure applying lever being disposed near the point where the bottom edges begin to slope towards the supporting flange. Further, the mouth of the U-channel is made narrower than the supporting flange, by indenting the sides or limbs, the pivots 7 of the pressure applying levers taking their bearing between parallel portions 9 of the sides.

For the purpose of advancing each loose extension the aforementioned predetermined amount after the initial setting has been made, it is provided on its underside with a rack 10 or its equivalent, which in the embodiment shown in Figures 3–5 is engaged by a projection or projections 11 at the pressure applying end of the lever 2 as the latter is turned, to effect thereby advancement of the end piece a distance approximately equal to the pitch of the teeth. The retraction of the end piece is caused by turning the lever 2 in the opposite direction, which movement also relieves the pressure on the end piece allowing it to collapse in relation to the beam and to be removed from the main beam if desired.

In the embodiment shown in Figures 1 and 2, a separate lever 12 is provided for advancing the end piece, this lever being pivotally mounted at 13 between the parallel portions 9 of the channel sides and having a lateral projection 14 which engages with the rack teeth 10. With this embodiment the end piece is lifted by the lever 12 as it effects the advancement, and the pressure applying lever 2 is thereafter turned to apply the necessary pressure to hold the end piece rigid with the beam 3.

As shown, each end piece is of solid T section with the teeth 10 formed by spaced approximately semi-circular recesses made in the edge of the limb of the T. In Figures 1 and 2 and 5 the T has a single leg, whereas in the embodiment of Figures 3 and 4 it has two legs with the pressure applying end 4 of the pivoted lever 2 disposed between the legs. An end piece, such as illustrated in Figures 3 and 4 may be a built up structure comprising the plate aforesaid with two angle plates secured to the underside thereof with their projecting legs in spaced apart relation and the teeth formed along the edge of each leg.

For ease of working the lateral projections 11 or 14 which engage the rack teeth may comprise circular studs or rollers, and the pressure applying end 4 of the lever 2 will be slightly curved with the axis of curvature coincident with the pivot 7 of the lever 2.

The pressure applying lever 2 and the separate lever 12 in the case of the embodiment of Figures 1 and 2 are provided with handles, as shown, which may be removable.

In the embodiment of Figure 5 there is provided a removable handle 15 which is constructed with a forked end 16, the pressure applying lever 2 having flat sides 17 over which the forked end of the handle can be engaged for turning the lever.

For the purpose of positively retaining the lever 2 in the pressure applying position until released by a manual manipulation, the means shown in Figure 5 may be employed. The lever is provided with a ratchet 18 and cooperating therewith is a spring controlled pawl member 19 which allows the end piece to be extended by the lever 2 but prevents it being pushed back into the main beam 3 until the pawl is manually lifted from engagement with the ratchet. Conveniently, the pawl member 19 consists of an arc shape member pivoted at one end 20 to the beam between the parallel portions 9 of the sides of the beam, the pawl tooth 21 being held resiliently in engagement with the ratchet by a spring 22.

An extension 23 of the said member 19 is provided to be engaged by the hand or by any suitable implement for disengaging the pawl from the teeth 18.

The main beam 3 may have a loose end piece at one or each end, but in order to provide for a fine adjustment of the length of the support, each end of the beam is provided with a reversible end piece as before described, and the teeth 10 of the respective end pieces are of a different pitch. The adjustment is made by trial and error on the first support placed in position, and all subsequent supports are set to a like adjustment before they are placed in position, so that the work of assembling a supporting structure is considerably shortened. The pressure applying device associated with each loose extension provides maximum frictional contact between the end piece and the main beam when the end piece is held rigid therewith, and the minimum when the pressure is released. In order to increase the maximum frictional contact, the engaging surfaces of the end piece and the main beam may be roughened or serrated.

The support according to the invention may be other than straight, e. g. it may be of arch shape, the loose end pieces being shaped to correspond where necessary. Further, the means for adjusting the length of the support may include in addition to the one or more end pieces, one or more sections of any desired shape, each of which may be inserted in the main beam 3.

The improved support may be made of wood, metal or other suitable material, or a combination of any of such materials.

It is a feature of the invention that the improved support can be wedged between smooth main supports, instead of resting on them, and for this purpose, the extremities of the loose end pieces may be constructed with a wedging surface to give a better or firmer grip than would be provided by the projecting lips aforesaid, the fact that the end pieces can be readily removed from the main beam providing for interchangeability as between end pieces adapted for different purposes.

We claim:

1. An extendible support for use in building construction comprising a main beam, an end piece adjustable longitudinally relative to said main beam to vary the effective length of the support, said end piece being provided on its under-

side with a rack, and pressure applying means carried by the main beam for clamping together the end piece and main beam in different positions of longitudinal adjustment, said pressure applying means including a lever pivoted to the main beam and cooperating with said rack to adjust the end piece relative to said beam.

2. An extendible support for use in building construction comprising a main beam of channel formation, an end piece lying within the space provided by the channel formation of the main beam and adjustable relative to said main beam to vary the effective length of the support, and means mounted on the legs of the channel formation of the main beam for cooperation with said end piece to adjust and secure the latter longitudinally relative to said main beam, said means comprising a lever pivoted to the main beam and having a portion for engaging the end piece to cause it to move relative to the main beam, and also having a portion for engaging the end piece to move it against and in locking contact with the main beam.

3. An extendible support for use in building construction comprising a main beam of channel formation, an end piece lying within the space provided by the channel formation of the main beam and adjustable relative to said main beam to vary the effective length of the support, a rack carried by the end piece, a lever pivotally carried by the main beam and having an end portion for engaging the end piece to force it into engagement with the inner face of the web of the channel forming the main beam, said lever also having means for engaging said rack.

4. An extendible support according to claim 3 wherein said lever is provided with ratchet teeth, and a spring tensioned pawl member carried by the beam and adapted to engage said ratchet means on the lever to lock said lever in adjusted position.

5. An extendible beam for use in building construction, comprising, a main beam including a web and offset side flanges which converge and terminate in spaced parallel portions, an end piece loosely mounted and housed within the main beam and adjustable longitudinally relative to said main beam to vary the effective length of the support, said beam and end piece having adjacent contacting slidably related faces, and pressure applying means for clamping together the end piece and the main beam in different positions of longitudinal adjustment, said pressure applying means comprising a lever pivotally mounted between the said parallel portions of the flanges on the main beam and having a cam portion for forcing the said slidably related faces of the end piece and beam together to hold the beam and end piece in selected adjusted relation.

6. An extendible beam for use in building construction, comprising, a main beam including a web and offset side flanges which converge and terminate in spaced parallel portions, an end piece loosely mounted and housed within the main beam and adjustable longitudinally relative thereto, said end piece consisting of a structural shape including a web having a lip at one end and also having an offset portion, said web being adapted to slidably engage the inner face of the web of the main beam and said offset portion lying between the converging side flanges of the main beam and having the lower edge thereof formed with rack teeth, and means for adjusting and clamping the end piece and main beam together in different positions of longitudinal adjustment, said means being pivotally mounted between the said parallel portions of the flanges of the main beam and including a part engaging said rack teeth and a cam part for forcing the web of the end piece and the web of the main beam together.

7. An extendible support according to claim 5, wherein the end piece terminates in a lip for engagement with a main support member, and wherein the means for adjusting the end piece is separate from the pressure applying means.

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