Oct. 2, 1945. A. H. HAWES 2,386,161

TEMPORARY SUPPORT FOR USE IN CASTING CONCRETE FLOORS AND SIMILAR PURPOSES

Filed June 20, 1944 2 Sheets-Sheet 1

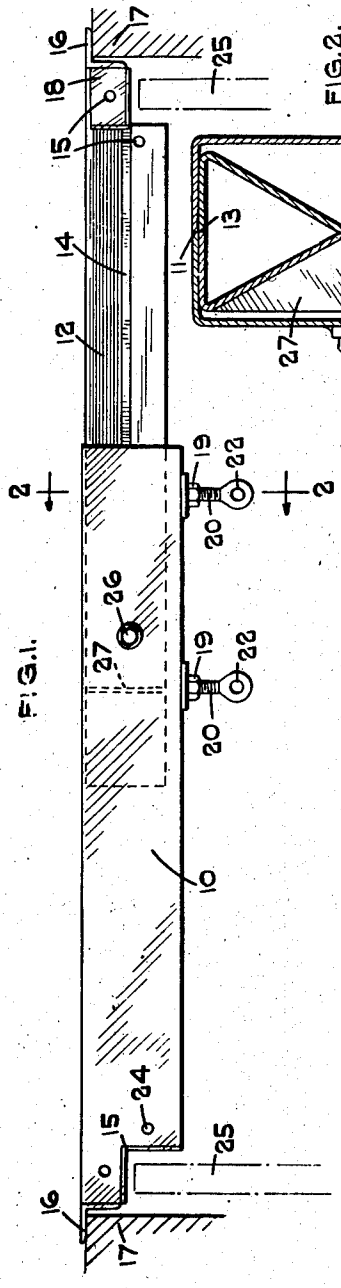


FIG. 1.

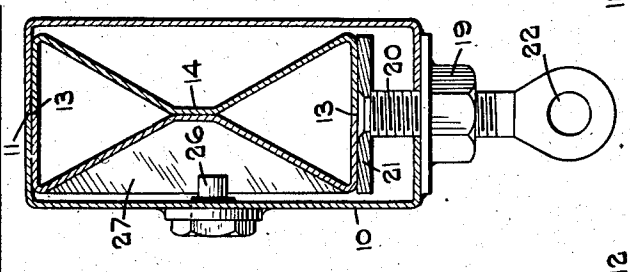


FIG. 2.

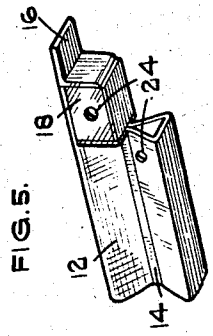


FIG. 5.

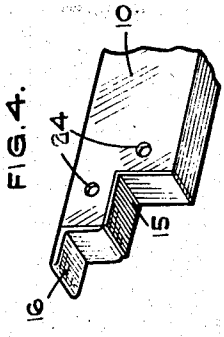


FIG. 4.

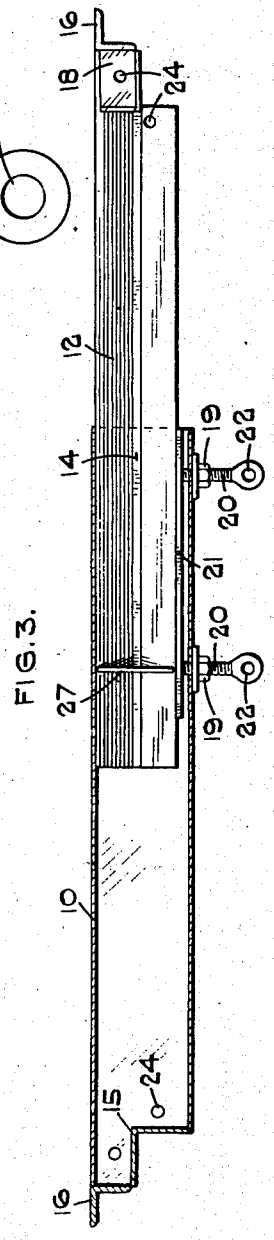


FIG. 3.

INVENTOR
Albert Henry Hawes
By Harry J. Lucke
ATTORNEY.

Oct. 2, 1945. A. H. HAWES 2,386,161

TEMPORARY SUPPORT FOR USE IN CASTING CONCRETE FLOORS AND SIMILAR PURPOSES

Filed June 20, 1944 2 Sheets-Sheet 2

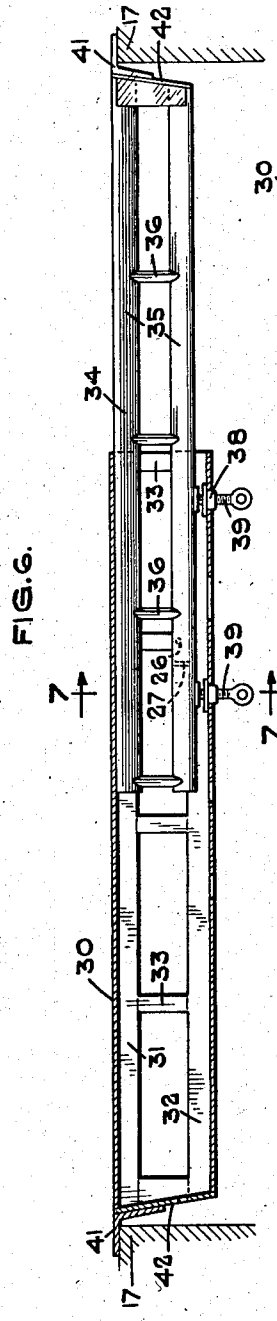


FIG. 6.

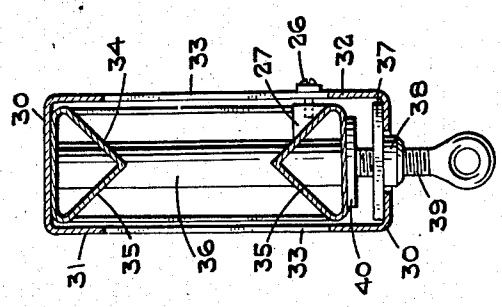


FIG. 7.

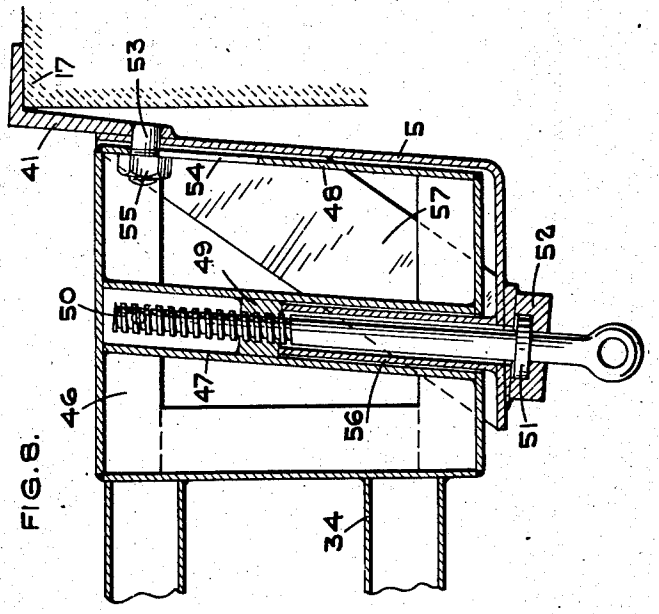


FIG. 8.

INVENTOR
Albert Henry Hawes.
BY Henry J. Lucke
ATTORNEY.

Patented Oct. 2, 1945 2,386,161

UNITED STATES PATENT OFFICE

2,386,161

TEMPORARY SUPPORT FOR USE IN CASTING CONCRETE FLOORS AND SIMILAR PURPOSES

Albert Henry Hawes, Erdington, Birmingham, England, assignor to C. Bryant & Son, Limited, Small Heath, Birmingham, England, a British company

Application June 20, 1944, Serial No. 541,160
In Great Britain May 24, 1943

13 Claims. (Cl. 189—37)

This invention relates to temporary supports for use in casting concrete floors and similar purposes and refers more particularly to the kind of temporary support which comprises a plurality of members which can slide telescopically one upon another or one within another so as to form an extensible beam and having portions at the ends of thin flat form which can rest upon walls or girders so that the beam is supported thereby.

The object of the present invention is to provide an improved construction.

Referring to the drawings:

Figure 1 is an elevation of one form of the invention as in use.

Figure 2 is a cross-section of 2—2 of Figure 1.

Figure 3 is a longitudinal section of the beam removed.

Figure 4 is a perspective view illustrating the outer end of the outer member.

Figure 5 is a similar view but of the inner member.

Figure 6 is an elevation partly in section of a modified form of the beam.

Figure 7 is a section of 7—7 of Figure 6.

Figure 8 shows a means of vertically adjusting the beam.

According to the present invention a support for the purpose specified comprises a plurality of members of hollow section telescopically adjustable one within another and one or more movable locking devices disposed in one or more openings in the outer member and having adjustable portions engaging the inner surface of the outer member and the outer surface of the inner member, and adapted to lock the members together at any adjusted position.

The locking device may consist of a screw and nut element arranged transversely to the length of the two members. For instance the or each locking device may be placed in any one of a number of openings in the outer member and adapted to engage the outer surface of the inner member.

The outer member of a telescopic pair may be deeper than the inner member and when they are assembled together and locked and before being loaded the two members may be slightly inclined to each other so that the structure as a whole has its middle part disposed slightly above its ends, the deflection due to loading bringing the upper surfaces of both members substantially into line.

The invention is particularly useful in connection with shuttering for forming ceilings. In practice after a ceiling has been cast it is necessary to remove the shuttering plates for these would fall down if the beams were completely removed, but by slightly lowering the beams the shuttering can be removed plate by plate.

The invention further comprises means for adjusting the beam bodily and vertically in relation to this support so that the ceiling can be cast in any desired relation thereto.

The form of the invention illustrated in Figures 1 to 5 comprises two beam members the outer one 10 of which is of box-section and can be conveniently made from two sheet metal members welded together at the top and bottom, the upper weld being marked 11 in Figure 2. The inner member 12 is formed from two M shaped sheet metal members again welded at the top and bottom as at 13 in Figure 2, but this member has the sectional shape substantially of an hour-glass, the two juxta-posed triangles being again welded together at 14.

The outer end of the outer member 10 is cut away and provided with a reinforcing angle plate 15 and with a further angle plate 16 which latter is intended to rest upon the wall 17 or other member on to which the beam is to be mounted.

The outer end of the inner member may be similarly formed but as shown it is provided with a rectangular extension 18 and a similar supporting angle-piece 16.

The outer member is provided with a fixed nut or screwed member 19 welded to this outer member and this is provided with a screw 20 carrying a pressure plate 21 abutting against the underside of the inner member, the screw being provided with an eye piece 22 so that it can be operated by a tommy-bar.

As shown in the drawings there are two of these screw devices and when they are operated the upper surfaces of the inner and outer members of the beam are brought into alignment except for the thickness of the metal of the outer member, but when the screws are retracted the parts of the beam may be telescoped to reduced or increase the length of the beam as for withdrawing the beam from its supports or fixing it on its supports, and obviously the beam can be used with supports different distances apart within the longitudinal adjustment provided.

As will be obvious after the ceiling has been cast by the shuttering plates previously referred to, the beam can be slightly lowered, thereby preventing the shuttering plates from entirely falling down but permitting them to be gradually removed one by one.

The ends of the beams may be provided with holes **24** into which a suitable tool may be inserted for pulling the beam off its support after the screws have been slackened.

It is not essential that the ends of the beam should be cut away and provided with the reinforcements **15** and **18**, and the ends of the beam may be perpendicular or inclined to their length. They are shown cut away to facilitate their use with vertical members **25** which form part of supports for wall shuttering, it being assumed that both the walls and the ceiling will be formed from concrete.

To prevent the two parts of the beam being entirely separated a stop **26** is provided which coacts with the plate **27** which is welded in a suitable position to the inner member of the beam.

Although the invention is illustrated as comprising a beam of two parts, it will be obvious that it might be of three parts, i. e. two inner members with a central outer member, or more than three parts may be used.

In the construction shown in Figures 6 and 7 having two main members sliding telescopically together, the outer member **30** may consist of upper and lower channels **31**, **32**, placed directly above each other with their open sides directed towards each other and connected at intervals along the length of the member by connecting strips or struts **33** welded to the sides of the channels. In cross section, this member is therefore substantially rectangular and the depth of the section may be greater than its width.

The inner member **34** of the pair may be built up of upper and lower horizontal tubes **35** of substantially triangular section the upper one having its apex arranged along the centre of its lower side and the lower one having its apex arranged along the centre of its upper side. These two tubes are arranged in spaced relationship one directly above the other and they are connected at intervals by tubes **36** of round or other section placed vertically and passing through openings in the lower side of the upper tube and in the upper side of the lower tube, the vertical connecting tubes extending in both cases to the inner wall of the opposite side of the triangular section. The vertical connecting tubes are welded to the upper and lower tubes. The member **34** thus has a substantially hour-glass section.

Along the lower side of the outer member a series of circular holes is provided and in addition one or more slots may be provided.

Each hole is adapted to receive one of the locking devices for locking the two members in any desired adjusted position.

Preferably two locking members are provided one near each end of the overlapping portions of the two members.

Each locking member may include a square plate **37** to which a nut **38** is welded and a screw **39** passing through the nut and the plate, the upper end of the screw having a disc **40** welded thereto and the lower end of the threaded stem being formed as an eye for engagement by a tommy-bar or formed for engagement by a wheelbrace.

These locking members can be placed in the outer member through the openings between the side connecting members and then downwardly so that the nut projects through the hole in the lower side of the outer member and the circular plate to which the nut is welded rests upon the upper surface of the lower side of the outer member.

The discs which are welded to the upper ends of the screwed stems are adapted to bear on the underside of the inner member and force the said inner member upwardly so that its upper surface binds against the lower surface of the top of the outer member.

The inner member at a suitable position may have a plate or lug **27** welded thereto and the outer member may have a fixed pin or set screw **26** in a suitable position forming a stop to prevent the inner member from being slidden entirely out of the outer member.

At each end of the beam, angle plates **41** are provided each having a substantially vertical portion welded to a plate **42**, itself welded across the end of one of the beam members. These angle section members each have a flange at the top which is substantially flush with the top of the outer member and projects beyond the end of the beam so as to be capable of resting upon the top of a wall or in a recess in a wall or upon the top of a girder or beam in a building.

These angle plates may be fixed in relation to the beam members to which they are attached or the beam members may be vertically adjustable in relation to the angle plates by screw and nut mechanism so that after the beam is in position and after a floor has been cast the beams can be lowered by operating such screw and nut mechanism to allow the floor supporting plates or members to be removed.

Further where an end of the telescopic support rests upon a metal beam and it is intended to mould a concrete wall below the beam, temporary side walls are used for forming the mould for the wall and either end of the telescopic beam may be provided with a threaded hole for receiving a screw to assist in keeping such temporary walls in position.

That end of the inner telescopic member which is outside the outer member may be formed as a box-like construction of deeper section than the part of the inner member which is disposed within the outer member, this part of box-like construction may terminate in an inclined plate to which wall engaging angle section member is welded.

If the telescopic beam is to be adjustable vertically in relation to the angle section plates, as seen in Figure 8, then this box-like structure **46** may be provided with a tube **47** extending from top to bottom and welded in position, the tube being parallel to the inclined plate **48** at the end and this tube may have welded in it a nut **49** which is engaged by a screwed stem **50** having a flange **51** housed in a cap **52** welded to the underside of an L shaped bracket **5**, one limb of which extends under the box-like structure and the other limb of which extends upwardly at the end of the box-like structure. In such a construction the angle plate is welded to the upwardly projecting limb of the L shaped bracket and the latter is guided on the end of the beam member by providing it with a fixed stud **53** projecting through a vertical slot **54** in the end of the beam member and providing nuts **55** on the inner end of this stud. The lower limb of the L shaped bracket may carry an upwardly projecting tube **56** which slides in the tube **47** which is fixed to the beam member and further the two limbs of the L shaped bracket may be connected together by welded corner plates **57** which engage at opposite sides of the box-like structure.

The opposite end of the telescopic beam is

formed by the outer member and if the beam is to be vertically adjustable in relation to the angle section wall engaging plates then a similar arrangement may be provided at this end.

With this arrangement the top of both beam members is closed and the lower side of the inner member is of substantially triangular section with its apex uppermost so that concrete or material is not likely to fall into the hollow beam and any that does is reflected outwardly by the inclined sides of the lower side of the inner member.

What I claim then is:

1. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantially rectangular box section and open at one end, a hollow inner member of substantially hour-glass section with mutually parallel upper and lower faces, said inner member being telescopically slidable within said outer member and adapted to project beyond the open end of the latter and locking means associated with said outer member adapted on operation to press the upper face of said inner member into frictional engagement with the upper wall of said outer member.

2. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantially rectangular box section and open at one end, a hollow inner member telescopically slidable within said outer member and adapted to project beyond the open end of the latter, said inner member having mutually flat upper and lower faces and outwardly concave lateral faces and locking means associated with said outer member adapted on operation to press the upper face of said inner member into frictional engagement with the upper wall of said outer member.

3. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantially rectangular box section and open at one end, a hollow inner member telescopically slidable within said outer member and adapted to project beyond the open end of the latter, said inner member having mutually flat upper and lower faces and lateral faces of trough section with the bases of the troughs fixedly connected together, and locking means associated with said outer member adapted on operation to press the upper face of said inner member into frictional engagement with the upper wall of said outer member.

4. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising a hollow inner member telescopically slidable within said outer member and adapted to project beyond the open end of the latter, said inner member having mutually connected upper and lower portions of triangular section, with the bases of the triangles in parallel relationship and forming the upper and lower faces of the member and locking means associated with said outer member adapted on operation to press the upper face of said inner member into frictional engagement with the upper wall of said outer member.

5. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantially rectangular box section and open at one end, a hollow inner member telescopically slidable within said outer member and adapted to project beyond the open end of the latter, said inner member being formed from two sheet metal blanks folded substantially to M section and fixedly connected together to provide spaced triangular section portions whose bases constitute the upper and lower faces of the member, and locking means associated with said outer member adapted on operation to press the upper face of said inner member into frictional engagement with the upper wall of said outer member.

6. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantially rectangular box section and open at one end, a hollow inner member telescopically slidable within said outer member and adapted to project beyond the open end of the latter, said inner member having spaced marginal portions of closed triangular section whose bases are mutually parallel and constitute the upper and lower faces of the member, together with hollow elements connecting said marginal portions and spaced apart longitudinally of said member, and locking means associated with said outer member adapted on operation to press the upper face of said inner member into frictional engagement with the upper wall of said outer member.

7. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantially rectangular box section and open at one end, a hollow inner member telescopically slidable within said outer member and adapted to project beyond the open end of the latter, said inner member having spaced marginal portions of closed triangular section whose bases are mutually parallel and constitute the upper and lower faces of the member, together with bracing means connecting said marginal portions intermediate the ends thereof, and locking means associated with said outer member adapted on operation to press the upper face of said inner member into frictional engagement with the upper wall of said outer member.

8. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantally rectangular box section and open at one end, a hollow inner member of substantially hour-glass section with mutually parallel upper and lower faces, said inner member being telescopically slidable within said outer member and adapted to project beyond the open end of the latter, a pair of screws carried by said outer member and spaced apart longitudinally of the latter, said screws being adapted to act upon the lower face of said inner member in a manner to press the upper face of the same into frictional engagement with the upper wall of said outer member, and a thrust plate interposed between said inner member and the operative ends of both said screws.

9. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantially rectangular box section and open at one end, a hollow inner member telescopically slidable within said outer member and adapted to project beyond the open end of the latter, said inner member having spaced marginal portions of closed triangular section whose bases are mutually parallel and constitute the

upper and lower faces of the member, together with bracing means connecting said marginal portions intermediate the ends thereof, a pair of screws carried by said outer member and spaced apart longitudinally of the latter, said screws adapted to act upon the lower face of said inner member in a manner to press the upper face of the same into frictional engagement with the upper wall of said outer member, and a thrust plate interposed between said inner member and the operative ends of both said screws.

10. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantially rectangular box section and open at one end, a hollow inner member telescopically slidable within said outer member and adapted to project beyond the open end of the latter, said inner member having mutually flat upper and lower faces and outwardly concave lateral faces, locking means associated with said outer member adapted on operation to press the upper face of said inner member into frictional engagement with the upper wall of said outer member, a web extending transversely of one of the trough section faces of said inner member and a stop member projecting within said outer member and co-operating with said web to prevent endwise separation of said inner and outer members when said locking means are released.

11. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantially rectangular box section and open at one end, a hollow inner member telescopically slidable within said outer member and adapted to project beyond the open end of the latter, said inner member having spaced marginal portions of closed triangular section whose bases are mutually parallel and constitute the upper and lower faces of the member, together with bracing means connecting said marginal portions intermediate the ends thereof, locking means associated with said outer member adapted on operation to press the upper face of said inner member into frictional engagement with the upper wall of said outer member, a lug on one of the marginal portions of said inner member, and a stop member projecting within said outer member and co-operating with said lug to prevent endwise separation of said inner and outer members when said locking means are released.

12. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantially rectangular box section and open at one end, a hollow inner member of substantially hour-glass section with mutually parallel upper and lower faces, said inner member being telescopically slidable within said outer member and adapted to project beyond the open end of the latter, locking means associated with said outer member adapted on operation to press the upper face of said inner member into frictional engagement with the upper wall of said outer member, brackets at the ends of said beam for supporting the latter as a whole, the beam ends being guided on said brackets for up and down adjustment relative thereto, a nut fixed to each of said beam ends, and a captive screw carried by each of said brackets for effecting said adjustment of the beam ends.

13. A telescopic beam for use as a temporary support in casting concrete floors and for similar purposes, comprising an outer member of substantially rectangular box section and open at one end, a hollow inner member of substantially hour-glass section mutually parallel upper and lower faces, said inner member being telescopically slidable within said outer member and adapted to project beyond the open end of the latter, locking means associated with said outer member adapted on operation to press the upper face of said inner member into frictional engagement with the upper wall of said outer member, brackets at the ends of said beam for supporting the latter as a whole, a substantially vertically disposed tube fixed to each of said beam ends, a nut fixed in said tube, a second tube telescopically slidable within the first mentioned tube and fixed to the adjacent bracket, and a captive screw carried by said bracket and extending through said tubes, said screws on rotation co-operating with said nuts to raise and lower the beam as a whole in relation to said brackets.

ALBERT HENRY HAWES.