Nov. 10, 1925. 1,560,976

W. R. C. COOK

ADJUSTABLE BUILDING FORM FOR CONCRETE CONSTRUCTION

Filed March 19, 1925 2 Sheets-Sheet 1

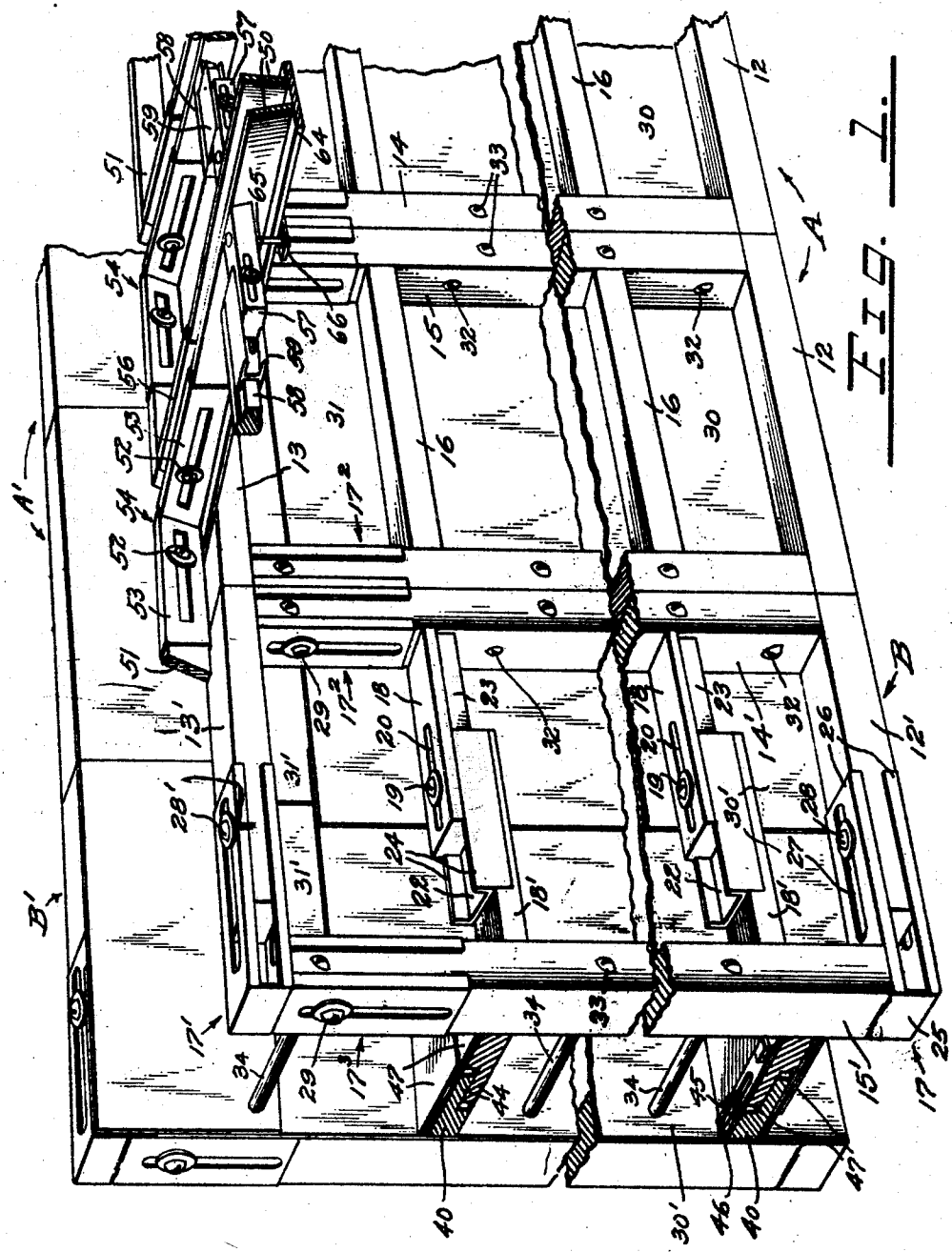


Fig. 1.

INVENTOR
William R. C. Cook
BY
Pierre Barnes
ATTORNEY

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W. R. C. COOK

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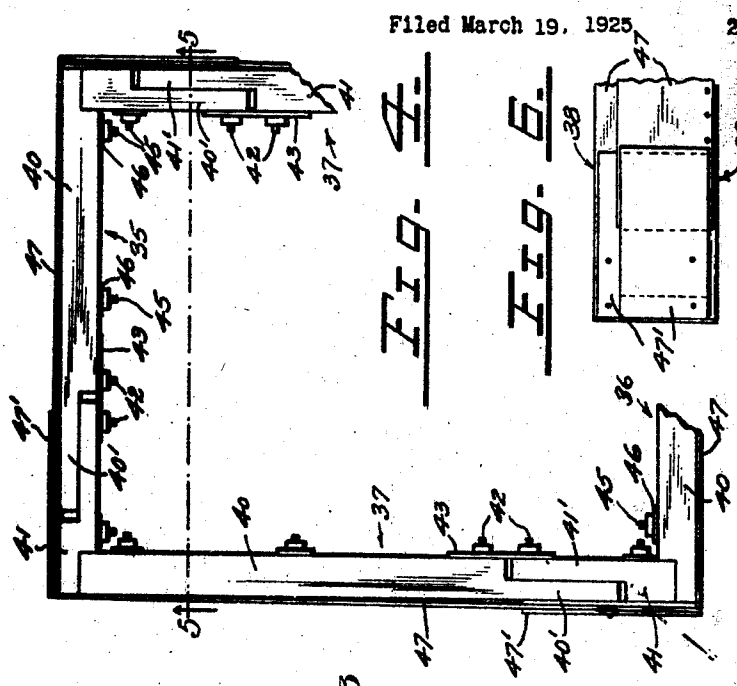


Fig. 4.

Fig. 6.

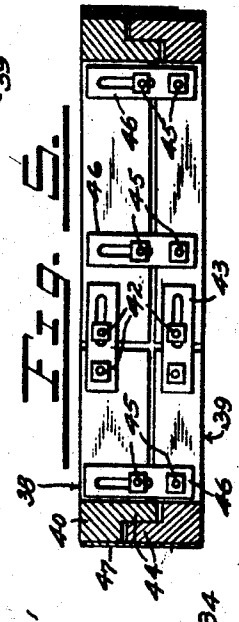


Fig. 5.

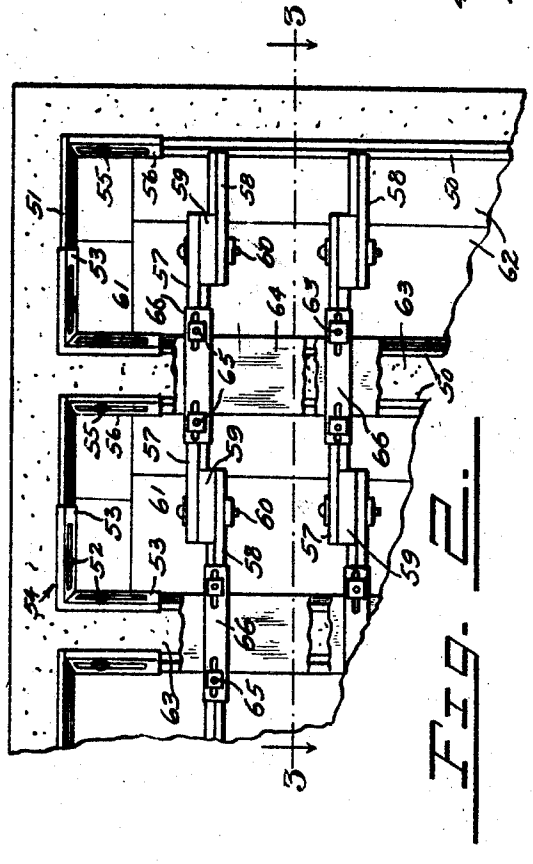


Fig. 2.

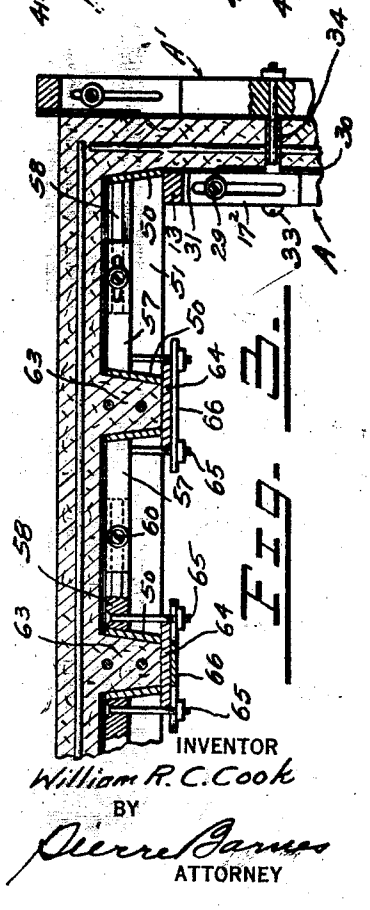


Fig. 3.

INVENTOR
William R. C. Cook
BY
Pierre Gamon
ATTORNEY

Patented Nov. 10, 1925. 1,560,976

UNITED STATES PATENT OFFICE.

WILLIAM R. C. COOK, OF SEATTLE, WASHINGTON.

ADJUSTABLE BUILDING FORM FOR CONCRETE CONSTRUCTION.

Application filed March 19, 1925. Serial No. 16,664.

To all whom it may concern:

Be it known that I, WILLIAM R. C. COOK, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Adjustable Building Forms for Concrete Construction, of which the following is a specification.

This invention relates to sectional forms for use in concrete structures.

The object of my invention, generally, is the improvement of devices of this character to render the same efficient and facilitate the construction of concrete walls, ceilings, etc., at less cost than heretofore.

A more specific object is to provide concrete forms having adjustable members which enable the forms to be conveniently erected and secured together in a rigid manner to receive the concrete material and retain the same in place while setting, and permitting such forms, or false work being readily disassembled to be successively used during the progress of the work.

Other objects and advantages of the invention will appear in the following specification.

The invention consists in the provision of a novel construction of forms, the means for regulating the same, and in the manner or means for detachably securing the same together, as will be hereinafter described and claimed.

In the accompanying drawings,—

Figure 1 is a perspective view illustrating my improved forms applied as a mold for concrete in the construction of a wall and ceiling of a building. Fig. 2 is an underside view of the ceiling forms shown in Fig. 1, the wall forms being removed; Fig. 3 is a transverse vertical section on line 3—3 of Fig. 2 and including the wall forms not shown therein. Fig. 4 is a front elevation of an adjustable frame to be employed with the wall forms for providing a window-opening, or the like, therein; Fig. 5 is a horizontal sectional view on line 5—5 of Fig. 4; and Fig. 6 is a fragmentary plan view of Fig. 4.

In carrying out my invention I provide a wall mold comprising an inner form and an outer form each of which is constituted of a plurality of sections.

The inner form, as shown in Fig. 1, is composed of sections A and B, each having in its construction a rectangular frame, preferably of wood, consisting of horizontally disposed base and plate elements 12 and 13, respectively, and vertical post elements 14 and 15 at the opposite sides of a section.

In each section A, the posts are both rigid with the base element 12 and are also rigidly connected with each other by means of one or more spaced apart rails 16.

The section B has one of its posts, as 14^1, rigid with the base element 12^1 thereof, but the complementary post, indicated by 15^1 is connected to the base element by means of an adjustable extension 17 for relative horizontal movements to regulate the width of the frame.

The posts 14^1 and 15^1 of the horizontally adjustable frame of section B are, moreover, provided with one or more adjustable rails. Each of these rails consists of two complementary parts 18 and 18^1 slidably connected with each other as by means of a coupling bolt 19 extending through apertures in the respective parts, the aperture of one such rail part being in the nature of a slot 20. For reinforcing the connection between the complementary rail parts 18 and 18^1, a bar of a substantially H-shape is employed, the bar web 22 being interposed between the associated rail parts, the sides of the latter being recessed as at 23 to receive the bar flanges 24.

The adjustable extension 17 above referred to, preferably made of metal, is pressed or otherwise formed to provide an end wall 25 and two parallel arms 26 of channel shapes in transverse section to afford ways within which an end of the base element 12^1 is slidably mounted. The arms 26 are slotted as at 27 to accommodate a coupling bolt 28 extending through said base element. An extension 17^1, similar to that above described, is provided for the plate element 13^1 of the member B, and similarly thereto is connected adjustably with the plate element by means of a coupling bolt 28^1.

The plates 13 and 13^1 of the members A and B are connected for vertical adjustment with regard to the respective post elements by means of post extensions 17^2 and 17^3 similar to the aforesaid extensions the extensions 17^2 are rigid with and depend from the respective plates, and the extension 17^3

is made rigid with and depends from the plate extension 17^1 as shown in Fig. 1. Bolts 29 are provided for coupling the extension members 17^2 and 17^3 to the respective posts for regulating the height of the plate elements thereof.

Secured to one side of the lower portion of the frames of each section A is a piece of sheet metal 30, overlapping which is a piece of sheet metal 31 secured to the respective cap 13.

In a horizontally adjustable section B, thero are two horizontally overlapping plates 30 secured to the respective posts 14^1 and 15^1, and two plates 31^1 secured to the plate 13^1 and extension 17^1, respectively, to overlap each other and also the subjacent sheets 30^1. By thus arranging the metal sheets vertical adjustment of the A sections and both vertical and horizontal adjustments of the B sections are permitted.

The sections A and B of the inner form are united one with the other by means of securing bolts 32.

The outer mold form for a wall is composed of a plurality of sections A^1, B^1 which are constructed and arranged substantially like the sections above described of the inner form.

The inner and outer forms are held in spaced apart relation corresponding to the thickness of a wall by means of bolts such as 33 extending through the frame elements of oppositely disposed sections and cooperating distance pieces placed between such sections.

As illustrated in Figs. 1 and 3, said distance pieces are of pipes 34 sleeved upon the respective bolts and said pipes may remain embedded in the material of the wall after its completion. To provide openings for windows, doors, etc., there is provided insertable frames such as shown in Figs. 4 and 5, comprising inner and outer members each composed of a top rail 35, a bottom rail 36, and side rails 37. The rails of the respective members being arranged to have plane inner and outer surfaces 38 and 39 to fit against the opposing surfaces of the inner and outer sheathing plates of the wall forms hereinbefore described.

More particularly, the rails of the respective members are each composed of two complementary elements, such as 40 and 41 which are rigidly joined at the respective corners with the elements of the adjacent rails. The elements 40 and 41 of each rail have overlapping end portions 40^1 and 41^1 which are coupled together in longitudinally adjusted positions by means of bolts 42 and tie plates 43. The rails of the inner and outer members are, moreover, formed with overlapping edge portions 44 to afford relative adjustment of the two members to suit the spacing for a wall between the sections of the inner and outer forms and are secured in regulated positions by means of bolts 45 and transversely arranged tie plates 46.

The perimeter of a frame for a wall opening is provided with overlapping metal sheathing plates 47 and 47^1 disposed substantially as shown in Figs. 4 to 6, inclusive, each such plate being rigidly secured to one of the rail elements and in slidable relation with the complementary plate.

An opening-frame is retained in proper position by being clamped between sections of the inner and outer wall forms, and may be supported by props or reinforcing devices (not shown) which are to remain embedded in a wall.

Included in the invention, is a ceiling mold illustrated in Figs. 1, 2 and 3, the same consisting of panel sections each having an adjustable frame having the shape of an elongated truncated pyramid, and preferably is constructed of wood, comprising inclined side and end members 50 and 51, respectively arranged in rectangular relation with each other.

A side member 50 of each panel frame is connected to the respective end members 51 by means of bolts 52 extending through slotted arms 53 of a corner attachment such as 54, the other side member of a panel frame is connected to the respective end members by means of bolts such as 55 and slotted arms as 56 extending rectangularly from each end member. The complementary side members 50 are connected intermediate their lengths by one or more rails, each comprising two elements 57 and 58 rigid with the respective side members and slidably connected with each other.

59 represents an H-shaped bar interposed between a pair of rail elements 57 and 58 and serving to reinforce the connection between the same.

One or more coupling bolts 60 are employed for securing the parts of a rail in adjusted relation. 61 and 62 represent pieces of sheet metal mounted upon the top of a frame, said pieces being disposed in overlapping relation, the outer marginal portions of the pieces being connected to the respective frame members for conjoint movement therewith.

The panel forms above described are supported by having their ends seated upon the inner wall forms, and in spaced apart relation to afford spaces for the reception of material to provide ceiling girders such as 63 in Fig. 3.

The form portion for the under surface of a girder is obtained by the use of a bridge piece 64, which may be of wood, held against the lower edges of the adjacent side members 50, 50 of two frames by means of suspending bolts 65 depending from the re-

spective frames to support stirrups 66 which bear against the under surfaces of the respective bridge piece.

What I claim, is,—

1. In a concrete building form, a form member including a rectangular frame with two-part side and end elements, one part of each such element being provided with two parallel arms of channel shapes in transverse section to receive therein the complementary part of the respective element, and coupling means for adjustably connecting the parts of each element.

2. In a concrete building form, a plurality of sections arranged in side by side relation with each other, all of said sections being vertically extensible and one of the sections horizontally extensible, each section comprising complementary parts adjustably connected together, and sheet metal plates rigidly secured to the respective parts and in slidable connection with the plates of the frame parts complementary thereto.

3. In a concrete building form, a form section having a rectangular frame comprising adjustably connected two part horizontal and vertical elements, one part of each element being rigidly secured at the respective corner with a part of an element of an adjacent element and metal plates secured to the respective parts of the frame elements and disposed in overlapping relation one with another.

4. In a concrete building form, a form member having a rectangular frame each side and end thereof consisting of a hollow metal element and a wood element slidably fitting within the respective metal element, the adjacent elements being rigidly secured together at each corner of the frame, means for securing the complementary slidably connected elements in selected adjustable relations with each other, and metal plates secured to the respective frame and in overlapping relation one with another.

5. In apparatus for forming a concrete wall having window and door openings therein, the combination with the inner and outer wall forms provided with opposed metal surfaces, and means for securing said forms at a selected spaced-apart relation with each other, of a form for a wall opening, said last named form comprising two rectangular frames disposed one in front of the other between the metal surfaces of the first named forms and provided with overlapping portions, means extending through the overlapping portions of the frames for securing the same in their relative adjusted positions, and sheet metal plates provided about the outer peripheral surfaces of both of said frames and in overlapping positions with respect to each other.

6. In apparatus for forming a concrete wall having window and door openings therein, the combination with the inner and outer wall forms provided with opposed metal surfaces, and means for securing said forms at a selected spaced-apart relation with each other, of a form for a wall opening, said last named form comprising two rectangular frames disposed one in front of the other between the metal surfaces of the first named forms and provided with overlapping portions, and means extending through the overlapping portions.

7. In apparatus for forming a concrete wall having window and door openings therein, the combination with the inner and outer wall forms provided with opposed metal surfaces, and means for securing said forms at a selected spaced-apart relation with each other, of a form for a wall opening, said last named form comprising two rectangular frames disposed one in front of the other between the metal surfaces of the first named forms and provided with overlapping portions, each of said frames consisting of longitudinally adjustable side and end elements severally composed of two overlapping portions, and means extending through the overlapping portions and the elements therefor.

8. In apparatus for forming a concrete wall having window and door openings therein, the combination with the inner and outer wall forms provided with opposed metal surfaces, and means for securing said forms at a selected spaced-apart relation with each other, of a form for a wall opening, said last named form comprising two rectangular frames disposed one in front of the other between the metal surfaces of the first named forms and provided with overlapping portions, each of said frames consisting of longitudinally adjustable side and end elements severally composed of two overlapping portions, and means extending through the overlapping and the elements thereof for securing the same in their relative adjusted positions, and sheet metal plates provided about the outer peripheral surfaces of both of said frames and in overlapping positions with respect to each other.

9. In a concrete building form, the combination with the wall forms, of a ceiling mold supported thereby and comprising adjustable panel sections, inclined side and end elements, said panels being disposed in spaced apart relation, bridge pieces extending between the adjacent panel sections, and means depending from the panel sections for securing said bridge pieces against the lower edges of the respective panel elements.

Signed at Seattle, Washington, this 7th day of February, 1925.

WILLIAM R. C. COOK.