July 7, 1970 J. H. HARKINS 3,519,242

CONCRETE COLUMN MOLD ASSEMBLY

Filed March 4, 1969

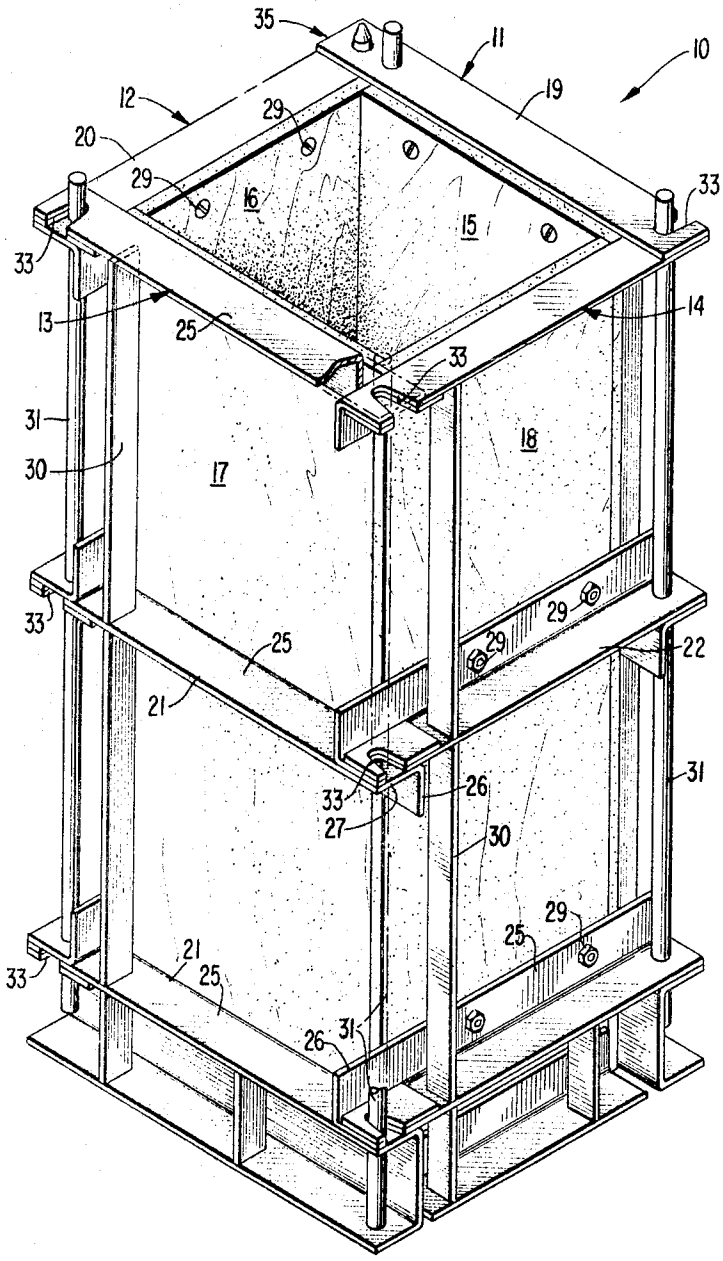


FIG. 1

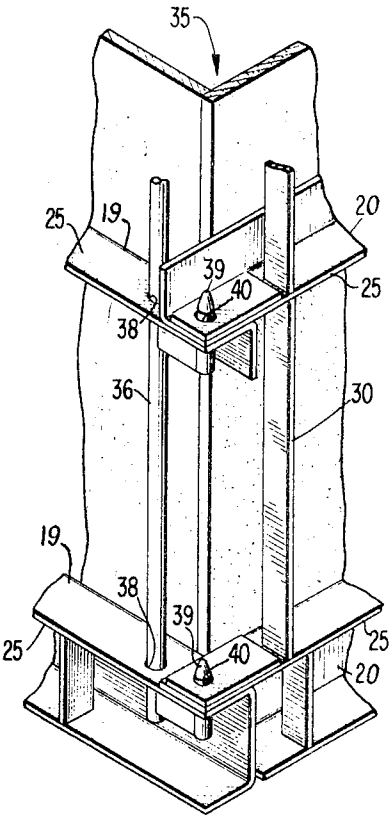


FIG. 2

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United States Patent Office 3,519,242
Patented July 7, 1970

3,519,242

CONCRETE COLUMN MOLD ASSEMBLY

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Filed Mar. 4, 1969, Ser. No. 804,129
Int. Cl. E04g 13/02
U.S. Cl. 249—48 8 Claims

ABSTRACT OF THE DISCLOSURE

A concrete column mold assembly comprising four flat panels movable together to form a rectilinear mold closure of rectangular cross section. Hinge connecting means are provided at the adjacent edges of the panels at three of the four corners of the mold assembly for hingedly connecting the panels together so that they can be wrapped around and unwrapped from around a column. A connecting means at the fourth corner of the mold assembly for connecting a first panel to an adjacent panel comprises a rod connected to the first panel and movable along the length of the mold, a series of spaced hooks carried by the rod, and a plurality of hook receiving openings defined in the framework attached to the first panel and the adjacent panel for receiving the hooks.

BACKGROUND OF THE INVENTION

When concrete columns are formed in the construction of buildings or similar structures, a mold is usually formed from boards or similar material and the concrete is poured into the mold. When the concrete has cured, the boards are stripped away from the column.

In the past it has been customary to construct the concrete column forms at the building site by the workmen erecting the special wooden molds. The boards of the molds are sometimes useable again when forming other columns, but the boards are usually specially constructed for each column and are frequently discarded after having been used only once or a few times. The material and labor costs of constructing the expendable and destructable wooden molds have become increasingly expensive. While various concrete column molds have been manufactured which can be reused, these molds have proven to be difficult to handle, are costly to manufacture, impractical to store, and are difficult to assemble and disassemble.

SUMMARY OF THE INVENTION

Briefly described, the present invention comprises a concrete column mold assembly which can be rapidly connected together to form a column mold, and which can be rapidly removed from the molded column. The mold assembly includes four panels movable together to form a rectangular mold cavity. Supporting framework is connected to the outside surface of each panel and includes hinge-like connecting means for hingedly connecting together the four sides of the mold at three of the four corners of the mold, and hook connecting means for connecting the mold together at its fourth corner. The hook connecting means includes a rod which carries hooks at intervals spaced along its length and is connected to the framework of one of the panels and movable along the length of the mold. Hook receiving openings are defined in the framework of the other panel which receive the hooks of the rod. This allows the workmen to wrap the panels about the location where the column is to be formed and connect the fourth corner of the mold assembly together along its entire length with the movement of the rod.

Thus, it is an object of this invention to provide a concrete column mold assembly for rapidly erecting a column mold, and for rapidly removing the mold assembly from around a formed column.

Another object of this invention is to provide a concrete column mold assembly which is inexpensive to manufacture, convenient to store and transport, and which can be rapidly assembled and disassembled.

Other objects, features and advantages of the present invention will become apparent upon reading the following specification, when taken in conjunction with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the concrete column mold assembly, with parts broken away for clarity.

FIG. 2 is a detailed perspective showing of the connecting means at the fourth corner of the column mold assembly.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now in more detail to the drawing, in which like numerals indicate like parts throughout the several views, FIG. 1 shows concrete column mold assembly **10** which includes panel assemblies **11**, **12**, **13**, and **14**. Each panel assembly includes a panel **15**, **16**, **17** and **18**, respectively, and panel supporting framework **19**, **20**, **21** and **22**, respectively. Panels **15–18** can be fabricated of any conventional material, such as plywood, and should be of sufficient thickness to provide the desired strength characteristics. The panels are flat on their interior or mold face surfaces and are usually arranged with respect to each other so that their edges overlap each other.

The framework **19**, **20**, **21** and **22** of each panel comprises a series of spaced L-shaped beams **25** which extend across the outside surface of each panel, and which are of a length greater than the width of each panel. The ends of each beam **25** extend beyond the edges of their panels. One flange **26** of each beam **25** is juxtaposed the outside surface of its panel while the other flange **27** extends outwardly from its panel, approximately at a right angle with respect to the longitudinal axis of the mold. Flanges **26** of each beam **25** are connected to the panels of the mold by bolts **29**. The bolts are arranged so that their heads are located on the inside or mold faces of the panels and lie flush with the mold faces. Vertical connecting straps **30** and vertical connecting rods **31** extend between and are connected to the horizontal flanges **27** of beams **25**. Vertical connecting rods **31** are positioned at the ends of beams **25** at one edge of each panel assembly, while vertical connecting straps **30** are displaced from the ends of beams **25** at the other edge of each panel assembly. Straps **30** and rods **31** are spaced away from the panels so that they can be grasped by the hands of the workmen. Each rod **31** is located beyond the edge of its respective panel so that it becomes a corner post at the corner of the mold assembly.

The end of each beam **25** opposite from the vertical connecting rod **31** of each panel defines an opening or slot **33** which faces away from the inside or mold face surface of the panel. The openings **33** in the beams **25** are aligned along the length of each panel and arranged to receive the vertical connecting rod **31** of the next adjacent panel. Openings **33** are arranged so that each panel assembly can be placed with their edges adjacent each other with the vertical connecting rods **31** received in the openings **33** of the next adjacent panel. The construction is such that when the panels are connected together in this manner they can be rotated with respect to each other in a hinge-like relationship, so that they can be wrapped around the column site when being assembled, and they

can be unwrapped from about the molded column when being disassembled. The vertical connecting rods **31** are rigidly connected to their respective beams **25** so that no moving parts are required for this hinge relationship.

As shown in FIG. 2, the fourth corner **35** of the mold assembly includes movable connecting rod **36** which is received in openings **38** defined in the horizontal flanges **27** of beams **25**. Rod **36** carries a plurality of projections or hooks **39** at spaced intervals along its length which correspond to the spacing of beams **25**. Circular openings **40** are defined in the horizontal flanges **27** of the beams **25** of the adjacent panel assembly and are located so that they will receive hooks **39**. A similar opening (not shown) is defined in the horizontal flange **27** of the beam **21** which carries movable connecting rod **36**. With this arrangement, when the openings **40** of the horizontal flanges **27** of the beams **25** of the adjacent panel assemblies at fourth corner **35** are aligned, the hooks **39** carried by movable connecting rod **36** can be projected into the aligned openings by moving connecting rod **36**. The workmen merely have to urge connecting rod **36** along its length to project all of the hooks **39** into their respective openings along the length of the fourth corner **35**. This can be done by using a hammer or similar instrument and hammering the lower surface of one of the hooks **39**. The space below most of the hooks **39** is completely open so that a hammer can easily engage the bottom surface of the hooks.

As is best shown in FIG. 1, the beams **25** of adjacent panel assemblies are oriented so that their flanges **26** extend in opposite directions and do not function to encumber the overlapping relationship of the horizontal flanges **27**. In order to create substantially flat top and bottom ends of the mold assembly, the beams at the ends of the panel assemblies are all positioned with their flanges **26** extending away from their respective ends. This requires some undercutting of the flanges **26** at the ends of the beams to enable the framework to fit together as required.

OPERATION

When the workmen connect the panel assemblies **11, 12, 13** and **14** to each other to form a concrete column mold, the panel assemblies are fitted together by inserting the stationary vertical connecting rods at an edge of each panel assembly into the openings **33** defined in the horizonal flanges of the beams **25** of the framework. The panel assemblies can then be rotated with respect to each other to form a box-like mold arrangement. The fourth corner **35** of the mold asembly (FIG. 2) is formed by extending the horizontal flanges **27** of the beams **25** in overlapping relationship so that their openings **40** are aligned and by moving movable connecting rod **36** along its length to project its hooks **39** into the aligned openings **40**. This connects the panel assemblies together and forms the fourth corner of the mold assembly.

When the concrete has been poured and allowed to cure, the panel assemblies **11, 12, 13** and **14** can be disconnected from the column by moving movable connecting rod **36** along its length to retract hooks **39** from the aligned openings **40** at the fourth corner **35** of the mold assembly, which disconnects panel assemblies **11** and **12** from each other. Panel assemblies **11, 12, 13** and **14** can then be rotated with respect to each other so as to unwrap the mold assembly from around the concrete column. Thus, the workmen merely move movable connecting rod **36** to either connect or disconnect the mold assembly from the column site.

Mold assembly **10** is constructed so that the panels **15, 16, 17** and **18** are fully supported and protected by the external framework, so that there is virtually no possibility of the panels becoming warped or damaged through extended use. Furthermore, each panel assembly **11, 12, 13** and **14** is self-contained and requires no external equipment such as bolts, clamps or screws when it is connected to the other panel assemblies. The overlapping relationship of each panel **15, 16, 17** and **18** is such that there is little if any possibility of the fluid material deposited into the mold leaking through the edges of the mold assembly, yet the arrangement is such that when the panel assemblies are rotated into their assembled rectangular configuration one edge of each panel will be in positive abutting relationship with the face of the next adjacent panel, and this abutting relationship is achieved without hazard of wear or damage to the face of the panels.

The mold assembly can be constructed of various different heights and shapes, so as to form extremely high columns or columns of various widths and shapes. The drawing illustrates a mold assembly for a short, square column, but this construction can be adapted for various other column configurations. Moreover, the panel assemblies are interchangeable to some degree in that the facing panel assemblies of a mold are useable with other matched assemblies to form different mold shapes.

While beams **25** of the framework of the panel assemblies have been illustrated as being L-shaped in cross section, it should be understood that various other configurations can be utilized without departing from the functional arrangement of the structure. For instance, U-shaped or tubular beams could be utilized, or beams of virtually any cross-sectional configuration can be utilized as long as the beams can be connected to the panels, the openings are properly positioned in the beams along one edge of the panels, and the vertical connecting rods are properly positioned at the opposite edge of the panels to enable the panels to rotate with respect to each other. Furthermore, the circular openings **40** defined in the horizontal flanges **25** at the fourth corner **35** of the assembly can be constructed as slots similar to the slots **33** at the other corners of the assembly.

While the invention has been disclosed as being useable as a concrete column mold, the ability of the panel assemblies **11, 12, 13** and **14** to hinge with respect to each other without becoming disconnected enables the panel assemblies to be placed in a single plane for use in molding walls. For instance, wider wooden panels **15, 16, 17** and **18** can be connected to the framework or wooden filler strips can be placed between adjacent ones of the panels to fill the gaps between the panels, and a plurality of lateral support beams connected to the framework to hold the panel assemblies in a flat plane. With this arrangement, the invention can be used as a wall mold or former when placed in facing relationship with another wall former.

While this invention has been described in detail with particular reference to preferred embodiments thereof, it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinbefore and as defined in the appended claims.

I claim:

1. A sectional concrete column mold assembly comprising a plurality of mold panels each defining a flat mold face between a first edge and a second edge of a mold panel and connectable together to form the mold faces of a mold cavity, and supporting framework connected to a side of each of said mold panels which is opposite from a mold face, said framework defining a plurality of connecting openings adjacent a first edge of a first mold panel and including engaging means which is adjacent a second edge of a second mold panel and which is constructed and arranged to engage said connecting openings and pivotally to connect said second mold panel to said first mold panel, said connecting openings being circular apertures defined in portions of said framework which extend laterally of said first edge of said first mold panel and said engaging means including a rod movable along said second edge of said second mold panel and carrying

hook members extendable into and out of said circular apertures.

2. The invention of claim 1 wherein said framework connected to a side of each of said mold panels includes beams longer in length than the width of a mold panel between a first edge and a second edge, of L-shaped cross section, and extending transversely to said first edge of said mold panels, each of said beams having a first flange juxtaposed and connected to a mold panel and a second flange extending away from a mold panel, said connecting openings being defined in said second flange, and said rod extending through said secod flange.

3. In a sectional mold assembly formed by a plurality of mold panels which define a closed mold when joined together, a first mold panel having a substantially flat first mold face between a first edge and a second edge of said first mold panel and a side opposite from and substantially co-extensive with said first mold face, a second mold panel having a substantially flat second mold face between a first edge and a second edge of said second mold panel and a side opposite from and substantially co-extensive with said second mold face, a framework attached to said side of said first mold panel and including a plurality of first frame members which extend transverse to said first edge and said second edge of said first mold panel and which have first apertures formed in aperture ends adjacent said first edge of said first mold panel, a framework attached to said side of said second mold panel and including a plurality of second frame members which extend transverse to said first edge and second edge of said second mold panel and which have second apertures formed in rod receiving ends adjacent said second edge of said second mold panel, a rod slidably positionable in said rod receiving ends of said plurality of second frame members, and a plurality of hook members fixedly positioned along the length of said rod relative to each other so that slidable motion of said rod relative to said plurality of second frame members causes said plurality of hook members simultaneously to enter said second apertures, the arrangement and construction of said plurality of first frame members and said plurality of said second frame members being such that when said

first edge of said first mold panel and said second edge of said second mold panel are placed adjacent each other, said first apertures and said second apertures coincide so that said plurality of hook members entering said first apertures also enter said second apertures to thereby pivotally connect said first mold panel to said second mold panel.

4. The mold assembly of claim 3 in which said plurality of second frame members have third apertures formed in aperture ends adjacent said first edge of said second mold panel and in which said second mold panel is pivotally connected to a third mold panel adjacent said first edge of said second mold panel by a connecting means extending through said third apertures.

5. The mold assembly of claim 4 in which said third apertures are slots formed in said plurality of second frame members.

6. The mold assembly of claim 4 in which said connecting means is a second rod carried by a plurality of third frame members attached to said third mold panel.

7. The mold assembly of claim 6 in which said second rod is fixedly positioned in said plurality of third frame members.

8. The mold assembly of claim 3 in which said plurality of first frame members extend laterally outwardly of said first edge of said first mold panel and said plurality of second frame members extend laterally outwardly of said second edge of said second mold panel.

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