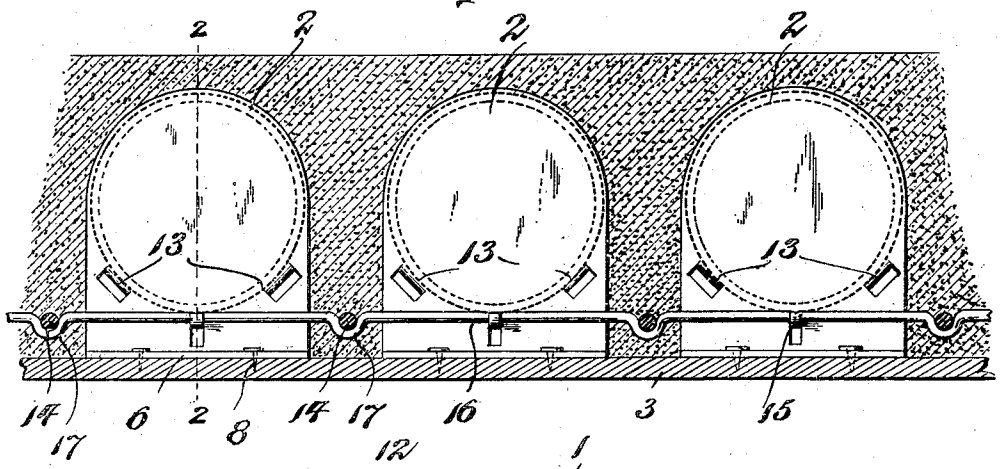
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REINFORCED CONCRETE CONSTRUCTION FOR FLOORS AND CEILINGS.

APPLICATION FILED FEB. 1, 1915. RENEWED OCT. 7, 1916.

1,206,752. Patented Nov. 28, 1916.

Fig. 1.



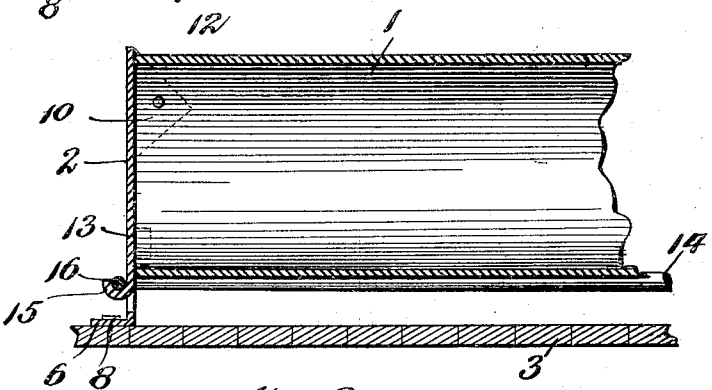


Fig. 2.

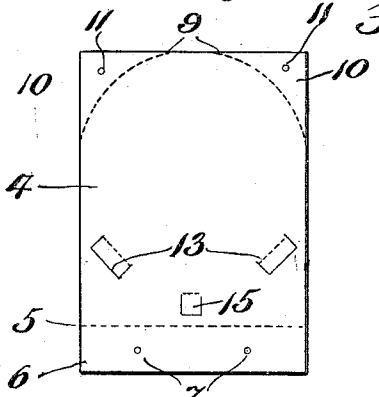


Fig. 3.

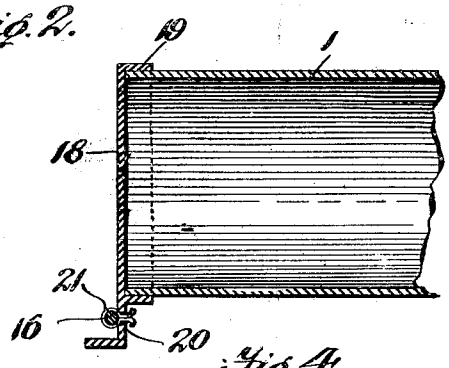


Fig. 4.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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REINFORCED CONCRETE CONSTRUCTION FOR FLOORS AND CEILINGS.

1,206,752. Specification of Letters Patent. Patented Nov. 28, 1916.

Application filed February 1, 1915, Serial No. 5,467. Renewed October 7, 1916. Serial No. 124,438.

To all whom it may concern:

Be it known that I, HAROLD DAVIS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented a new and useful Reinforced Concrete Construction for Floors and Ceilings, of which the following is a specification.

This invention relates to improvements in reinforced concrete constructions of buildings, and has special reference to the construction of reinforced concrete ceilings and floors for the same.

It is well known by those conversant with reinforced concrete constructions that the quantity of concrete generally employed in floor and ceiling work is far in excess of that necessary to sustain the load to which the floor thus constructed is to be subjected, such excess of material increasing the cost in this respect to a very great degree. To avoid this use of excess quantities in such constructions it has been common in the art to employ hollow molds, located at intervals and tied together in various ways, the concrete being poured about the molds and permitted to set. Such molds have been of various shapes in cross-section and made of various material, such, for instance, as sheet-metal, paper, &c., such light materials being usable for after the concrete has set no weight is borne thereby.

My invention aims to overcome certain well known difficulties heretofore existing in the economical use of these molds, whereby they are rendered practical, and hence the cost of construction greatly reduced while at the same time the sustaining power of the floor is not reduced to the least degree. Furthermore, by the use of such molds as I have described, air-spaces are provided within the floors, and these may be conveniently utilized for piping and wiring.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be particularly pointed out in the appended claims.

Referring to the drawing forming a part of this specification: Figure 1 is a transverse vertical sectional view of a floor or ceiling constructed in accordance with my invention, the section line being taken in advance of the ends of the molds, and the concrete being shown in position. Fig. 2 is a vertical longitudinal sectional view through one of the molds, the section being taken on the line 2 2 of Fig. 1. Fig. 3 is an elevation of the blank, before folding, and from which is formed the combined mold-closure or cap and support. Fig. 4 is a view similar to Fig. 2 and illustrating a modified form of combined mold-closure or cap and support.

Corresponding numerals of reference indicate corresponding parts in all the figures of the drawing.

In carrying out my invention, I employ, as heretofore stated, a number of hollow tubular molds 1, and these, it will be understood, may be cylindrical, elliptical, rectangular, or in fact, of any other shape in cross-section, of any desired length; and made of any desired material; such details forming no part of my present invention.

To each end of each mold, there is applied a combined closure or cap and support 2, but which, for convenience I shall merely term a "cap." These caps, as will be hereafter apparent, serve to close the ends of the molds, and thus prevent the undesired ingress of the concrete mass when filling in, and also serve to support the molds upon the temporary platform 3 both during the "filling in" and "setting" operations. Of course, the shape in cross-section of the molds will to a very great extent determine the form and construction of the caps used, and for this reason as well the very obvious manner in which the caps may be altered and varied, I do not limit my invention in this respect, and herein merely describe what I consider a very practical form and application of the invention to a mold substantially cylindrical in cross-section. In the present instance, I employ a rectangular blank 4 (shown in detail in Fig. 4), bending the same transversely, on the dotted line 5, near the lower end, to form a foot 6. Nail holes 7 may also be punched in the foot 6, and light nails 8, driven therethrough and into the temporary platform 3, for the purpose of spacing the molds uniformly apart. The two upper corners of the blank are preferably bent rearward on curved lines concentric with the molds, as indicated by the dotted lines 9, thereby forming mold embracing wings or flanges 10, and these may have nail-holes 11, formed therein, through which nails 12 may be driven into the molds, whereby the caps are fastened to the ends of the molds and

close the same. For additional supports to the molds, lips 13, may be punched from the blank 4, the lips being rearwardly disposed and arranged concentric with the mold, so that as will be obvious, the caps are supported above and below, and therefore cannot become displaced with relation to the molds. The lips 13 are so located that the molds themselves are supported a short but suitable distance above the temporary platform 3, whereby to permit of a sufficient quantity of the mass of concrete filling entering under the molds.

Any suitable means may be employed for tying the molds together and for supporting the steel reinforcing-rods 14, so that I do not wish to limit my invention in this respect. In the present instance, however, and as an apt illustration of what I consider one practical means for accomplishing this, I punch from each of the caps, preferably at about its vertical center and immediately above the foot 6 thereof, a lip 15, such lips of a series of caps serving as a means for securing and supporting a transverse tie-rod 16. The latter rod, at intervals occurring between the caps, is formed with kinks or bends 17, the latter forming rests for the steel reinforcing-rods 14, heretofore mentioned.

In Fig. 4, which, as heretofore stated, is an illustration of a modified construction, the tube 1 or form, has applied thereto a cap 18, from which there is formed in any suitable manner, an annular mold-receiving flange 19, which may either entirely surround the end of the mold, as shown, or the flange may be interrupted in form. So, also, in lieu of employing the tongue 15 for clipping the tie-rod in position with relation to the caps, the latter may have punched therein simply a small perforation 20, and a split spring-key, after the fashion of a cotter-pin, either sprung over the tie-rod and having its terminals thrust through the perforation and permitted to expand or forcibly expanded by hand after such connection is made. The result, in either instance, will be practically the same, for it will be seen that by the construction described and illustrated, a very large percentage of concrete, and, hence the cost, will be saved in the construction of floors and ceilings, and this too, not at the expense of strength and sustaining power of the same.

The operation of the invention or rather the manner of using the same in forming a floor or ceiling will be readily understood from the foregoing description, and in fact, does not differ from that in general use at the present time except for the use of my invention. The temporary platform 3 is utilized in the usual way, and upon this is mounted and secured the caps 3, by means of the nails 8, the ends of the latter being nipped off after the removal of the platform subsequent to a "setting" of the concrete mass. The tie-rods 16 are placed in position, and the lips 15 clipped thereto, after which the steel reinforcing rods are laid in the rests 17. The mass of concrete is now poured over and packed about the structure thus formed and permitted to "set" and is finished off in the manner usual to this operation.

Having described my invention, what I claim, is:

1. A reinforcing structure for reinforced concrete ceilings and the like, the same comprising a series of hollow molds arranged side by side, and a series of caps for closing the ends of the molds, said caps at their lower sides being extended some distance below the undersides of the molds to form an elevating means for the same and spaces thereunder for the reception of the concrete mass, the standards terminating at their lower ends in laterally disposed flanges forming bases.

2. A reinforcing structure for reinforced concrete ceilings and the like, the same comprising a series of hollow molds arranged side by side, and a series of caps for closing the ends of the molds, said caps at their lower sides being extended some distance below the undersides of the molds to form an elevating means for the same and spaces thereunder for the reception of the concrete mass.

3. A reinforcing structure for reinforced concrete ceilings and the like, the same comprising a series of hollow molds, arranged side by side and spaced apart, and a series of caps for closing the ends of the molds, said caps having flanges for engaging the molds, and at their lower sides extended some distance below the molds to form standards for elevating the molds and spaces thereunder for the reception of the concrete mass.

4. A reinforcing structure for reinforced concrete ceilings and the like, the same comprising a series of hollow molds, arranged side by side, a series of caps covering the ends of the molds and terminating at their lower ends in standards for supporting the same, and means connecting the caps and spacing the same and the molds apart.

5. A reinforcing structure for reinforced concrete ceilings and the like, the same comprising a series of hollow molds, arranged side by side, a series of caps covering the ends of the molds and terminating at their lower ends in standards for supporting the same, and tie-rods connected to the molds and serving to hold the same in their spaced positions.

6. A reinforcing structure for reinforced concrete ceilings and the like, the same comprising a series of hollow molds, arranged

side by side, a series of caps covering and engaging the ends of the molds and terminating at their lower ends in standards for supporting the same, a series of tie-rods connecting the caps and serving to aid in spacing the molds apart, each rod having seats formed therein at intervals between the molds, and reinforcing rods supported by the seats.

7. A reinforcing structure for reinforced concrete ceilings and the like, the same comprising a series of hollow molds, arranged side by side, a series of caps covering and engaging the ends of the molds and terminating at their lower ends in standards for supporting the same, a series of tie-rods connecting the caps and serving to aid in spacing the molds apart, each rod between the molds having kinks or bends formed therein and constituting seats, and reinforcing rods located in said seats.

8. A reinforcing structure for reinforced concrete ceilings and the like, the same comprising a series of hollow molds, arranged side by side, a series of caps covering and engaging the ends of the molds and terminating at their lower ends in standards for supporting the same, means for tying the caps together, rests formed in such means, and reinforcing rods supported by the rests.

9. A reinforcing structure for reinforced concrete ceilings and the like, the same comprising a series of hollow molds, arranged side by side, sheet-metal caps 4, bent at their lower ends, as at 5, to form a securing-flange 6, and above the same having their upper corners bent as at 9, to form flanges 10 to embrace the molds, and below the same having the punched tongues 13 and clip 15, the tie-rods 16 connected to the clips 15, and having the kinks 17, intermediate the molds, and the reinforcing rods 14 seated in said kinks.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HAROLD DAVIS.

Witnesses:
E. B. JOHNSON,
W. S. DUVALL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."