H. L. WELLS.

REINFORCED CONCRETE CONSTRUCTION.

APPLICATION FILED APR. 10, 1916.

1,220,915.

Patented Mar. 27, 1917.

2 SHEETS—SHEET 1.

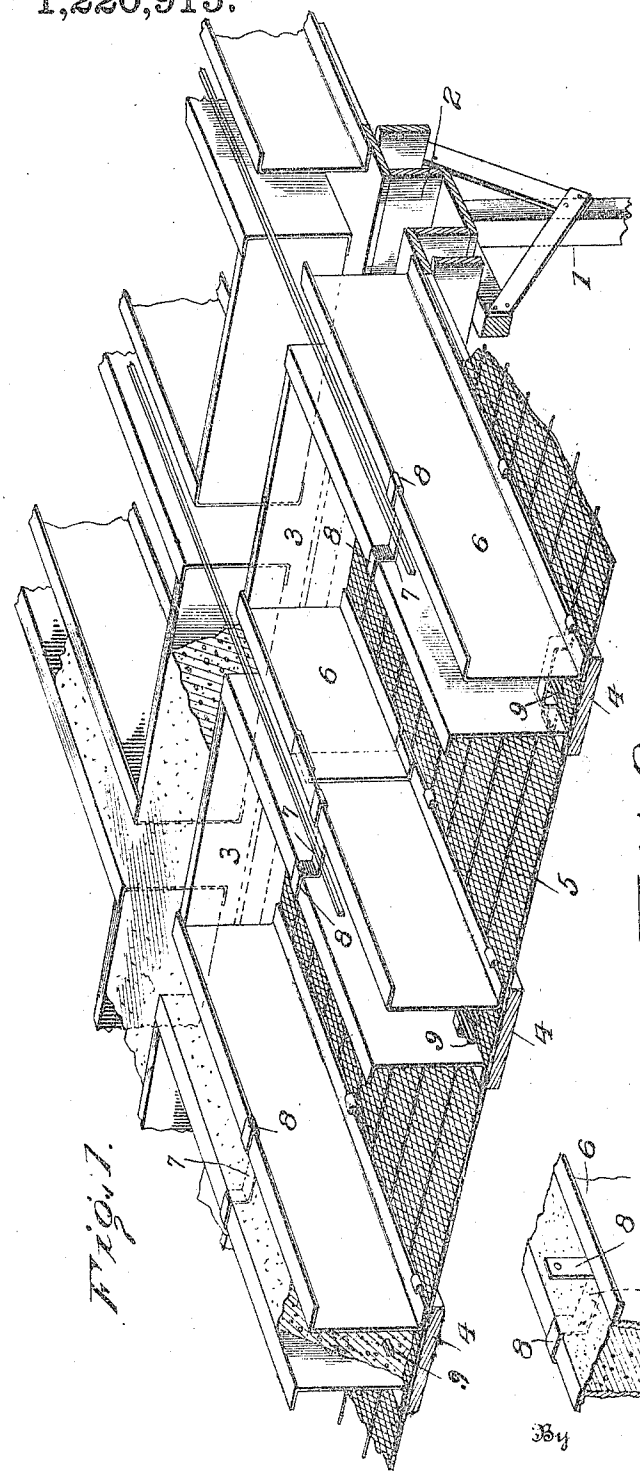


Fig. 1.

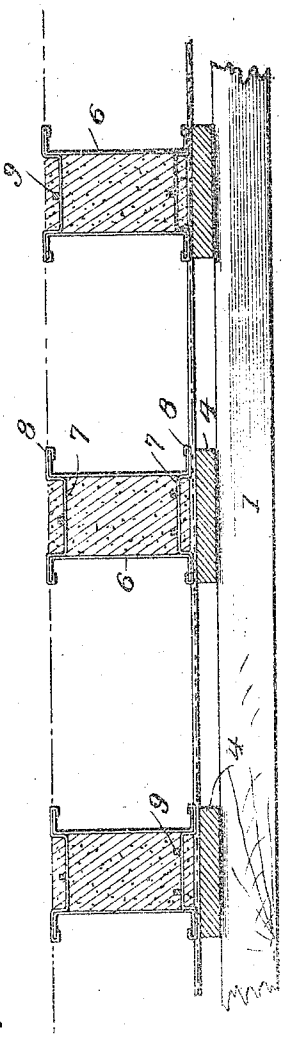


Fig. 2.

Fig. 3.

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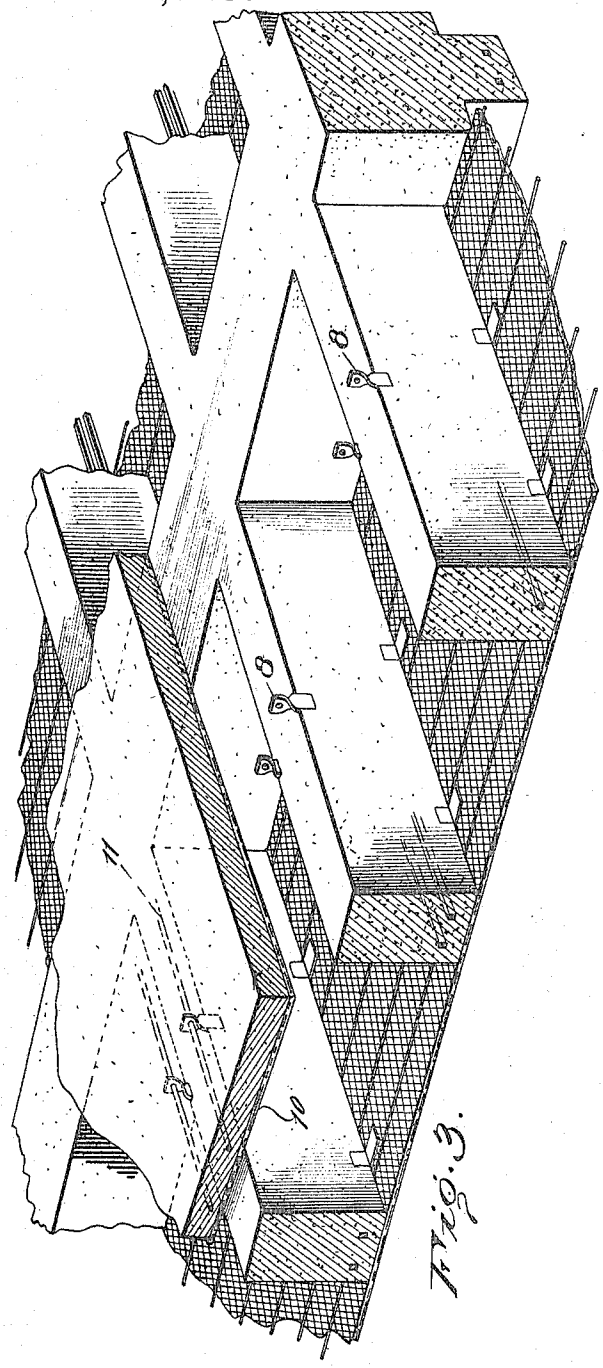


Fig. 3.

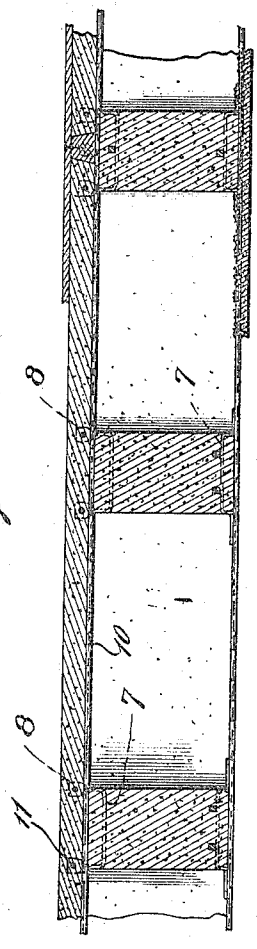


Fig. 4.

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UNITED STATES PATENT OFFICE.

HEWITT L. WELLS, OF WASHINGTON, DISTRICT OF COLUMBIA.

REINFORCED CONCRETE CONSTRUCTION.

1,220,915. Specification of Letters Patent. Patented Mar. 27, 1917.

Application filed April 10, 1916, Serial No. 90,286.

To all whom it may concern:

Be it known that I, HEWITT L. WELLS, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Reinforced Concrete Construction; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Heretofore in concrete floor construction many methods and means have been employed for the construction of variably spaced beams or joists for supporting the dead weight of construction and the loads to be carried thereby, the means employed in such construction including forms to mold the wet concrete in place, such as wood false work, terra-cotta tile with intervening spaces for the concrete and permanent and removable centers of steel or composition material. In known constructions of this type expense and delay in structural work are occasioned by the necessity of breaking down the false work around the joists after the concrete has set and then applying metal lathing to the joists; there is excess dead weight to be supported in the carrying members where terra-cotta tile is used; added cost is incurred in the use of permanent centers; and in the case of removable centers difficulty is experienced in removing the forms from position, it being necessary to take down from below a constructed floor, and then erect the ceiling. It is the object of my invention to obviate these objectionable features and to provide for the formation of a simple and highly efficient floor construction with but a minimum amount of shoring and frame-work to support the concrete in its initial stages of hardening, the construction being less expensive and more readily formed than those heretofore in use under similar conditions.

The invention is particularly adapted for use in the construction of concrete beams or joists for supporting dead weight of construction and the loads to be supported thereon with an undercovering or ceiling, but is equally of advantage in the formation of structures where the joists are exposed to view from below.

In the accompanying drawings, Figure 1 is a view in perspective showing the forms in position with part of the spaces filled with concrete. Fig. 2 is a sectional view. Fig. 3 is a perspective similar to Fig. 1, with the forms removed. Fig. 4 is a sectional view through the joists showing the floor completed. Fig. 5 is a detail.

In constructing a reinforced concrete floor after the manner of my invention, the usual false work 1 is built up in any preferred manner and forms 2 are set for the floor beams, the upper portions of these beams being formed between the mold boards 3. Supported on the false work are a series of spaced apart plates or boards 4, the distance between the plates being predetermined in every given case, depending on the weight to be sustained by the joists. Where an undercovering or ceiling is to be provided, metal lathing 5 is placed on the plates with the ends of the lathing secured in any preferred manner. Each of the plates 4 serves as a base or support for pairs of joist-forms 6 which I have shown as of channel shape with the flanges projecting outwardly. Manifestly forms of different shape may be employed if desired. These joist-forms are held spaced at their tops and bottoms by strap irons having a central spacing portion 7, their ends 8 engaging the joist-forms. As illustrated, these ends are bent around the flanges of the joist forms. The central portions of the strap irons used to space the lower edges serve the additional function of supporting reinforcing bars 9, such bars being laid between each pair of joist-forms. The ends of the latter fit snugly against the mold-boards 3 with the spaces between the latter and between the joist-forms intercommunicating, thus enabling a monolithic formation to be had of the beams and joists.

With the parts as described, the cementitious filling is poured into the spaces between the forms. This filling may be brought up flush with the tops of the different forms or to a lesser height, as desired. In the formation of the joists it will be seen that the central portions of the spacing straps become embedded in the concrete and that the meshes of the metal lathing between the plate 4 and the joist-forms will be filled with the cement, thus binding the lathing to the joists. When the concrete filling has sufficiently set the ends of the lower strap irons 9 are disengaged from the joist-forms and the ends of the top strap irons are bent outwardly and upwardly to free the joist-forms. Each of the joist-forms can then easily be lifted upward and carried to an-

other portion of the building for further use. The joist-forms may be removed without detriment immediately after the concrete has hardened, it being apparent that it is not necessary that the forms be kept in place until the concrete has attained a carrying strength, thus permitting the quick re-use of the forms, obviating the necessity and expense of having a large number of such forms on hand. In addition, removal at such stage assists the curing of the concrete and facilitates the attainment of its full strength.

The concrete beams and joists being in proper condition, stiffened metal sheets 10 or other supporting material are placed across the spaces between the joists with the ends of the strap irons projecting through such supporting material, these ends having been previously twisted so that they will more readily pass through the meshes of metal sheathing, where that material is used for supporting a concrete floor, the supporting material being securely held to the joists by retaining rods or wires 11 passed through the apertured ends of these strap irons. Concrete may then be poured over the entire surface to any required depth to form the floor, being reinforced in any preferred manner. Where the rods or wires are used to bind the floor supporting material to the joists, the poured concrete floor envelops the rods or wires in the ends of the strap irons previously embedded in the joists and makes a close union between the floor and joists. Manifestly flooring of other types may be employed, such as concrete slabs, or wood flooring, the necessary nailing strips for the latter either being embedded in the joists or secured thereto by the strap irons.

In a certain class of concrete construction ceilings or undercoverings are unnecessary. In such circumstances it is only necessary in the use of my invention to omit the lathing for the ceiling, the other steps in the construction being the same as before described.

The joist-forms used in one building are readily adaptable for use in another notwithstanding that the length of joists may differ. It is only necessary where a shorter joist is to be used to let sections of the joist-forms overlap. This is clearly shown in Fig. 1.

The advantages of my invention will be apparent. In the art to which it relates the desiderata are simplicity and a minimum expense. By my invention but few parts are required and the cost is relatively low because of the frequent re-use to which the forms may be put as well as to quickness with which forms may be removed for further use. With constructions heretofore in use the removal of the forms has been from below the floor, necessitating additional time and expense in placing the lathing for the ceiling after the forms have been taken down. This is obviated by the use of my invention where the ceiling lathing is readily and easily placed in the early stages of the form setting, the lathing being undisturbed when the forms are removed.

I claim as my invention:

1. The method of producing a reinforced concrete construction which consists in positioning a series of spaced apart base plates upon false work, arranging a ceiling support thereon, placing spaced forms on said base plates with a portion of said ceiling support interposed between said forms and said plates, placing reinforcing material between pairs of said forms, filling the spaces between pairs of said forms with cementitious material, and removing said forms upwardly from said base plates and ceiling support.

2. The method of producing a reinforced concrete construction which consists in positioning a series of spaced apart base plates upon false work, arranging a ceiling support thereon, placing spaced forms on said base plates with a portion of said ceiling support interposed between said forms and said plates, placing reinforcing material between pairs of said forms, filling the spaces between pairs of said forms with cementitious material to form joists, removing said forms upwardly from said base plates and ceiling support and forming a floor over said joists.

In testimony whereof I have signed this specification.

HEWITT L. WELLS.