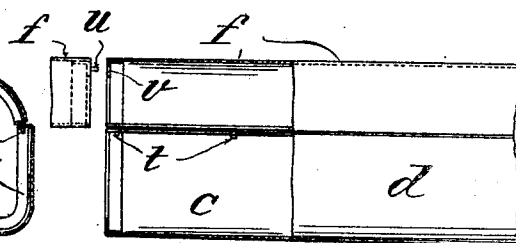
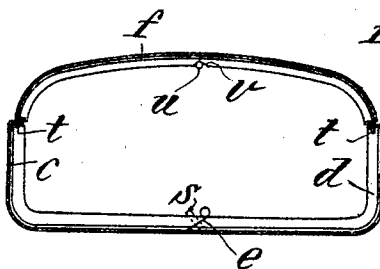
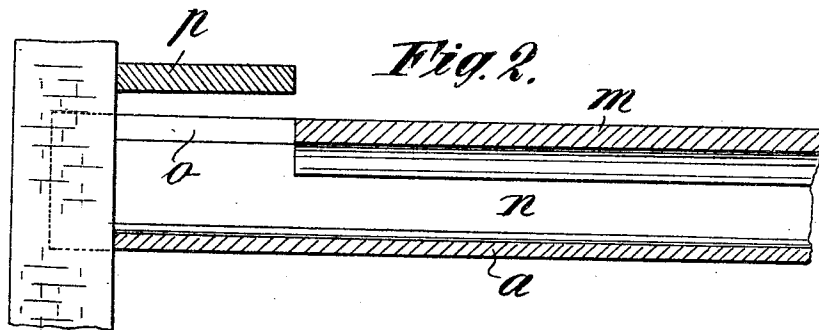
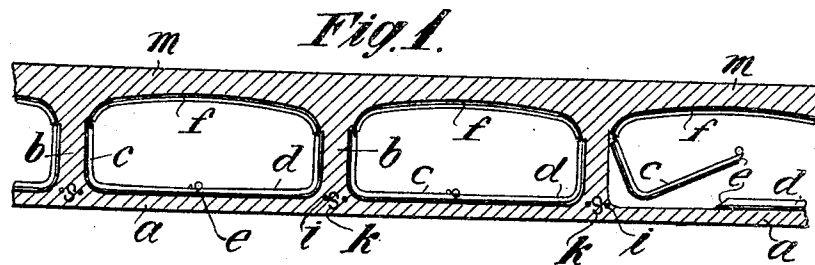


M. MILANKOVITCH.
 PRODUCTION OF HOLLOW REINFORCED CONCRETE SLABS.
 APPLICATION FILED JUNE 15, 1909.

940,041.

Patented Nov. 16, 1909.



Witnesses:
 M. H. Darg
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 his Attorney.

UNITED STATES PATENT OFFICE.

MILUTIN MILANKOVITCH, OF VIENNA, AUSTRIA-HUNGARY.

PRODUCTION OF HOLLOW REINFORCED-CONCRETE SLABS.

940,041.

Specification of Letters Patent. Patented Nov. 16, 1909.

Application filed June 15, 1909. Serial No. 502,259.

To all whom it may concern:

Be it known that I, MILUTIN MILANKOVITCH, a subject of the Emperor of Austria and King of Hungary, and resident of Vienna IV, Austria-Hungary, have invented a certain new and useful Improvement in the Production of Hollow Reinforced-Concrete Slabs, of which the following is a specification.

10 This invention has for its object the production by means of patterns of hollow reinforced concrete slabs having flat under sides. The use of patterns for the formation of hollow parts in the slabs is already
15 known but a rational method has hitherto been wanting which will not only allow of an easy casting of the slab but also of the simple removal of the patterns for repeated use without causing weakening of the upper plate at those parts where it is required
20 as a support for the slab.

The method forming the subject of the present invention overcomes the difficulty in that the upper plate formed simultaneously
25 with the ribs over the pattern is removed at those places where it is not required as a support for the slab in order to form openings in the otherwise monolithically produced slabs, which simplifies the removal of
30 the patterns, these openings being covered later by cast plates. In connection therewith the invention also includes the construction of a pattern which in consequence of its special mode of construction allows
35 this easy removal from the hollow spaces in the slab after setting of the concrete.

In the accompanying drawing Figures 1 and 2 show in section a slab produced according to the invention in two planes at
40 right angles to one another and Figs. 3 and 4 show to enlarged scale a transverse section and part longitudinal section of the pattern itself.

The method of production is as follows:—
45 On the base (not shown) constructed in the usual manner is first stamped a plate *a* forming the flat lower side and on this the patterns are laid the distance between which determines the thickness of the ribs *b* formed
50 between them. In the latter are inserted the reinforcements *i* and supporting ties *k*. The upper plate *m* above the upper side of the pattern is constructed simultaneously

with the rib *b* and then bound and allowed to set.

In order to remove the pattern from the slab easily for repeated use according to the invention the upper plate *m* is removed at those places where it is not required as a support, that is near the supporting points
60 in which by the casting of a slab over the pattern longitudinal passages *n* and also passages *o* are left which simplify the removal of the pattern, these being afterward closed by cast plates *p* (Fig. 2). In
65 order to simplify removal the patterns are preferably constructed, as shown in Figs. 3 and 4, from three pieces *c*, *d* and *f* of which the two parts *c* and *d* form almost symmetrically shaped angle pieces which determine
70 the size of the ribs and whose meeting edges *e* are beveled.

On its upper edge rests the cover piece *f* of the pattern which springs back somewhat against the outer faces of the side walls in
75 order to prevent it from uniting with the concrete. The sides are secured to one another by withdrawable pins *s* and to the cover by bolts *t* arranged on it and engaging in corresponding holes in the sides.
80 Moreover, the cover pieces are connected with one another by bolts *u* and slots *v* and the patterns are arranged one behind the other in order to prevent lateral movement
85 of the same.

The removal of the patterns after binding or setting of the ribs and upper plate is effected by withdrawing the pins *s* in order to release the two sides which are drawn out by a lateral rotation and are then brought
90 under the opening *o* the cover pieces being thereupon released in the same manner as the side pieces.

Having described my invention what I claim and desire to secure by Letters Patent of the United States is:—

1. Method of producing hollow reinforced concrete slabs by means of patterns with flat lower surfaces, consisting in casting the upper plate over the lower plate simultaneously with the ribs between the patterns in removing the upper plate at those points where it is not required as a support, in order to provide openings for the removal of the pattern, and then covering said openings with cast pieces.

2. Means for producing reinforced concrete slabs comprising in combination a pattern consisting of two angle-shaped sides whose meeting edges are beveled, said sides determining the size of the ribbed walls, and a cover piece *f* resting on their edges and springing back against their outer faces.

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

MILUTIN MILANKOVITCH.

Witnesses:

WILHELM BERGER,
ROBERT W. HEINGARTNER.