

No. 872,726.

PATENTED DEC. 3, 1907.

C. B. GRADY.
FLOOR SLAB.

APPLICATION FILED NOV. 16, 1906.

2 SHEETS—SHEET 1.

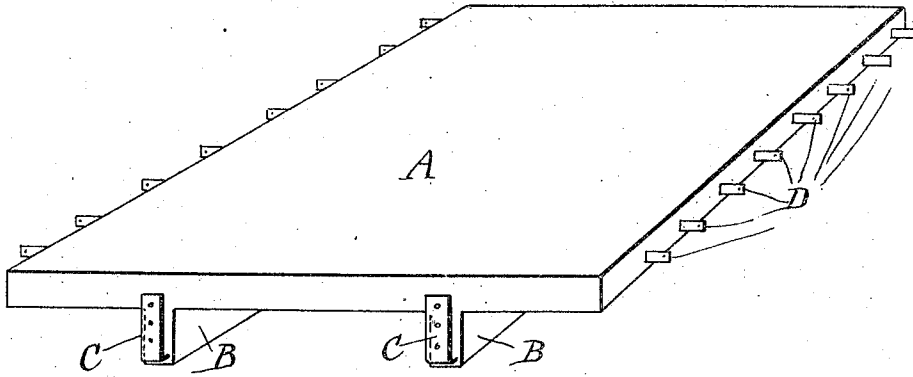
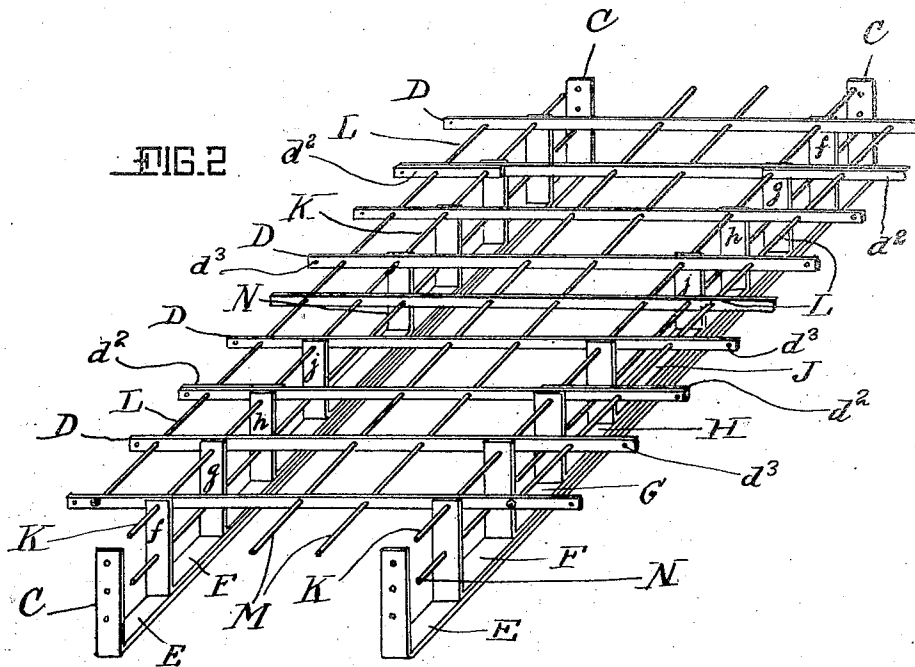


FIG. 1



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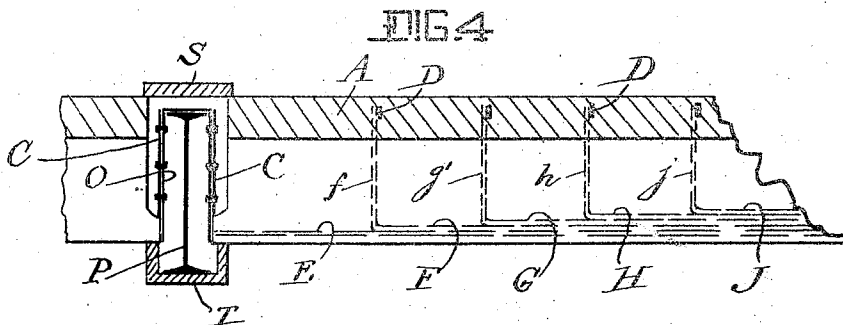
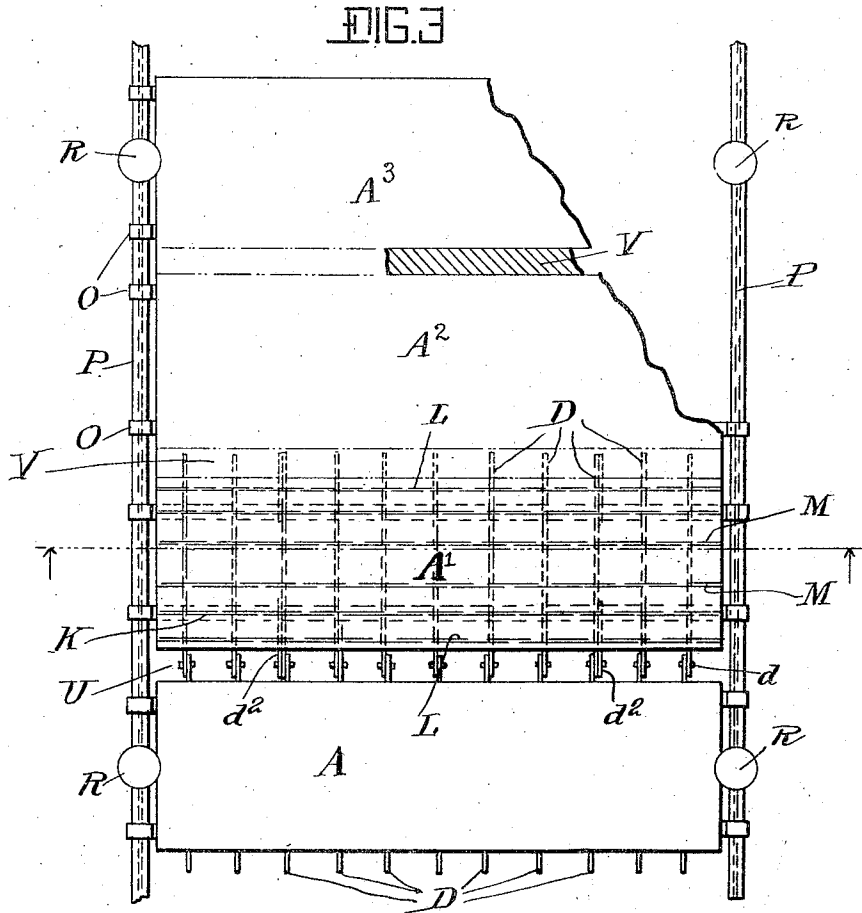
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CHARLES BENEDICT GRADY, OF WEST ORANGE, NEW JERSEY.

FLOOR-SLAB.

No. 872,726.

Specification of Letters Patent.

Patented Dec. 3, 1907.

Application filed November 16, 1906. Serial No. 343,681.

To all whom it may concern:

Be it known that I, CHARLES BENEDICT GRADY, a citizen of the United States of America, residing at West Orange, in the county of Essex and State of New Jersey, United States of America, have invented a new and useful Floor-Slab; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates, especially, to a form of floor-slab which is adapted to be readily suspended from or otherwise secured to the floor-girders of a building.

In the preferred form, the slab comprises a mass (formed as a rectangular or square slab) of concrete cast around and hardened upon a metallic reinforcement, said mass having, at one or more of its side edges, means whereby the slab may be readily secured to floor-girders.

It is also a characteristic of the preferred form of my invention that the metallic reinforcement, above mentioned, comprises a strengthening girder which is provided, at both of its ends, with metallic parts projecting beyond the side edges of the finished slab and constituting means for connection with or suspension from the floor-girders.

Another characteristic of the preferred form of my invention is found in the fact that the metallic reinforcement, above mentioned, comprises a series of bars passing across and through the mass of concrete, and projecting from opposite edges thereof, permitting successive slabs to be securely tied together by means which hold the projecting ends of bars of one slab into engagement with the projecting ends of bars of the adjacent slab.

In the accompanying drawings, Figure 1 shows a form of floor-slab made according to my invention; Fig. 2 shows a metallic frame around which concrete may be cast to form such a floor-slab; Fig. 3 is a plan view, showing the engagement of a succession of floor-slabs to one another and to floor-girders, and Fig. 4 is a section illustrating a detail of the suspension of a floor slab.

The form of slab shown in Fig. 1 comprises a mass of hardened concrete, having a body A and as many ribs, B, as the strain to be put upon the slab requires. The metallic reinforcement for the concrete mass may be of any kind of construction desired, but I prefer that each slab shall have hangers C, or other metallic connecting pieces, projecting from

opposite side edges of the slab, in order that the slab may be readily secured to or suspended from opposite floor-girders of a building-frame. I prefer, also, that each slab shall have a series of flat rods projecting (as shown at D, Fig. 1) at opposite edges of the slab, whereby overlapping ends of rods from successive slabs may be bolted together and successive slabs held together.

In the form of slab shown in Fig. 1, the hangers C are shown as flat plates having upwardly-bent ends, and the connectors D are shown as flat plates disposed upon their edges. While these forms are, it is to be understood, merely illustrative, they are especially useful for speedy connection of floor-slabs in a building-frame, and being also easily formed, as hereinafter described, are preferred.

While I have already stated that any form of metallic reinforcement may be employed to strengthen or constitute the skeleton of the floor-slab, I prefer the form of skeleton or frame shown, in perspective, in Fig. 2. This comprises two or more parallel girders (constituting the strengthening girders of the slab, when completed) which are secured in fixed relation by cross-bars D. Each girder, in the form preferred by me, is composed of several flat plates, E, F, G, H and J, connected in superimposed relation upon one another, and each having its two ends (C, f, g, h, i) turned up, as shown in Fig. 2. As the plates E, F, G, H, and J are successively shorter, the several plates will be nested as shown in the drawing, and the turned-up ends (C, f, g, h and i) are separated from one another. The parts E, F, G, H and J are made of stiff metal, and being secured together (for instance, by rivets passing through the successive plates where superimposed) the built-up girders are exceedingly strong. It will be noted, upon looking at Fig. 2, that the bent-up ends of plates E are marked C; as shown in Figs. 1 and 4, such ends project from the finished floor-slab and constitute the hangers.

To hold the parallel girders in fixed relation, I prefer to employ flat bars D, disposed edgewise across the frame or skeleton, and having their side edges in contact with the upper flat faces of the plate-ends (f, g, h and i). At the points where they intersect, the bars D and the plate-ends are provided with openings, and for the purpose of tying the bars and plate-ends together, rods K are

passed through all of the openings aforesaid. Below each of said rods, I pass other rods N through openings in the several pairs of bent-up ends *f*, *g*, *h* and *j*, to further strengthen the structure. In addition, the bars D are tied together and the entire frame strengthened by means of rods M disposed between the pair of girders, and by rods L outside of the said girders. A skeleton or frame, made up as aforesaid, is then suitably held or disposed, and a mass of concrete is poured or forced around said frame, and when hardened and in finished condition, the whole constitutes a floor-slab of the kind shown in Fig. 1.

Particularly referring to Fig. 4, it will be seen that a considerable part of the hangers C (viz., the bent-up ends of the longest plates E of the girders) are free of cement. To secure a floor-slab in place, it is lowered between the opposite floor-girders, P, (secured to and supported by columns R) and secured to saddles O, straddling said girders, thereby attaining a suspension of the floor-slab directly upon the floor-girders, and at points directly in line with (in reality integral with) the girders of the slab.

As before stated, the preferred form of floor-slab has bars D projecting from opposite side edges; and these bars are employed for the purpose of securing together successive floor-slabs. Near the ends of the bars, holes *d*³ (Fig. 2) are provided, and the ends of adjacent bars are disposed side by side (as shown between the slabs A and A¹), and bolts or rivets *d* are passed through the aligned openings of adjacent rod-ends. Additional strengthening pieces may be applied to the rod-ends, and, for this purpose, short bars, *d*² (lying close to the ends of bars D and secured in place by the rods K and L) may be used. The positions of such strengthening pieces as well as of the various rods L and M, will be seen by referring to the slab A¹ of Fig. 3. The space U between successive floor-slabs may be filled, in any way, by concrete, as shown at V between slabs A² and A³, and the space between the ends of the slabs and the floor-girders, as well as spaces necessary to level the floor, may be filled with concrete. For this purpose, a trough or box T

and a top board S, above and below the floor-girder will hold the concrete, until hardened, in the space between the ends of the floor-slabs and the floor-girders.

What I claim is:

1. In a floor-slab, a mass of hardened concrete formed about a metallic frame provided with a pair of strengthening girders each comprising a plurality of superimposed plates secured together where superimposed and with their ends bent upwardly, bars passing through the hardened concrete mass, contacting with the sides of the upwardly-bent ends of such plates and projecting from the side edges of the concrete mass, and means engaging with both the said bars and the plate-ends.

2. In a floor-slab, a mass of hardened concrete formed about a metallic frame provided with separate strengthening girders each comprising a plurality of plates connected together and each of said plates having upwardly bent ends, bars passing through the hardened concrete mass and projecting from the side edges of said mass, and means for securing each of said bars into engagement with one upwardly-bent plate end of each girder.

3. In a floor-slab, a mass of hardened concrete formed about a metallic frame provided with separate strengthening girders each comprising a plurality of plates connected together and each of said plates having upwardly-bent ends, bars passing through the hardened concrete mass, contacting with the sides of the upwardly-bent ends of such plates and projecting from the side edges of the concrete mass, and rods each of which extends lengthwise of a girder and passes through openings in all of the upwardly-bent plate-ends of such girder and through openings in all of the bars contacting with the sides of such plate-ends.

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

CHARLES BENEDICT GRADY.

Witnesses:

FRANK B. McCORD,
W. P. McCORD.