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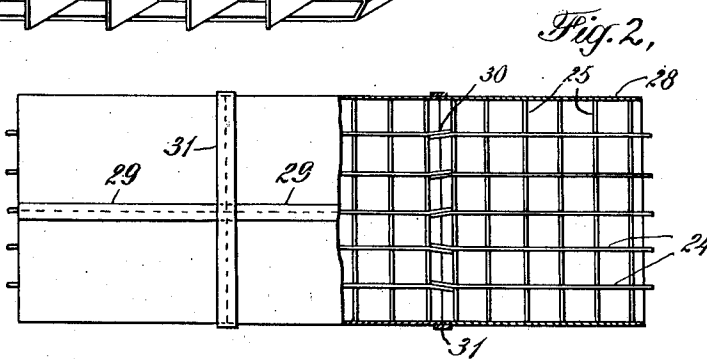
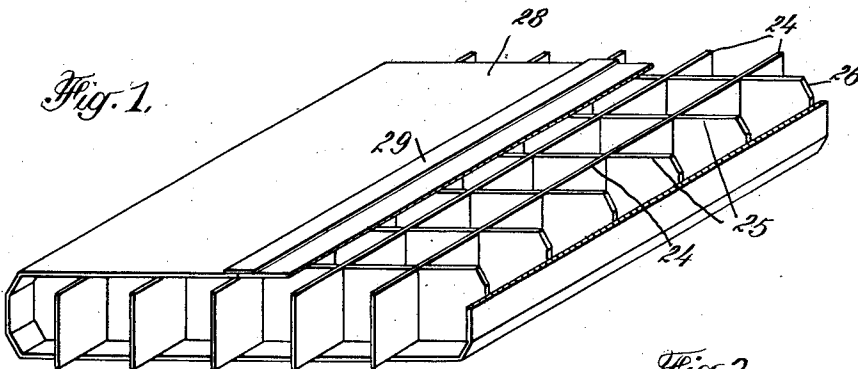
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2,299,614

STRUCTURAL UNIT

Filed Feb. 8, 1940

2 Sheets-Sheet 1



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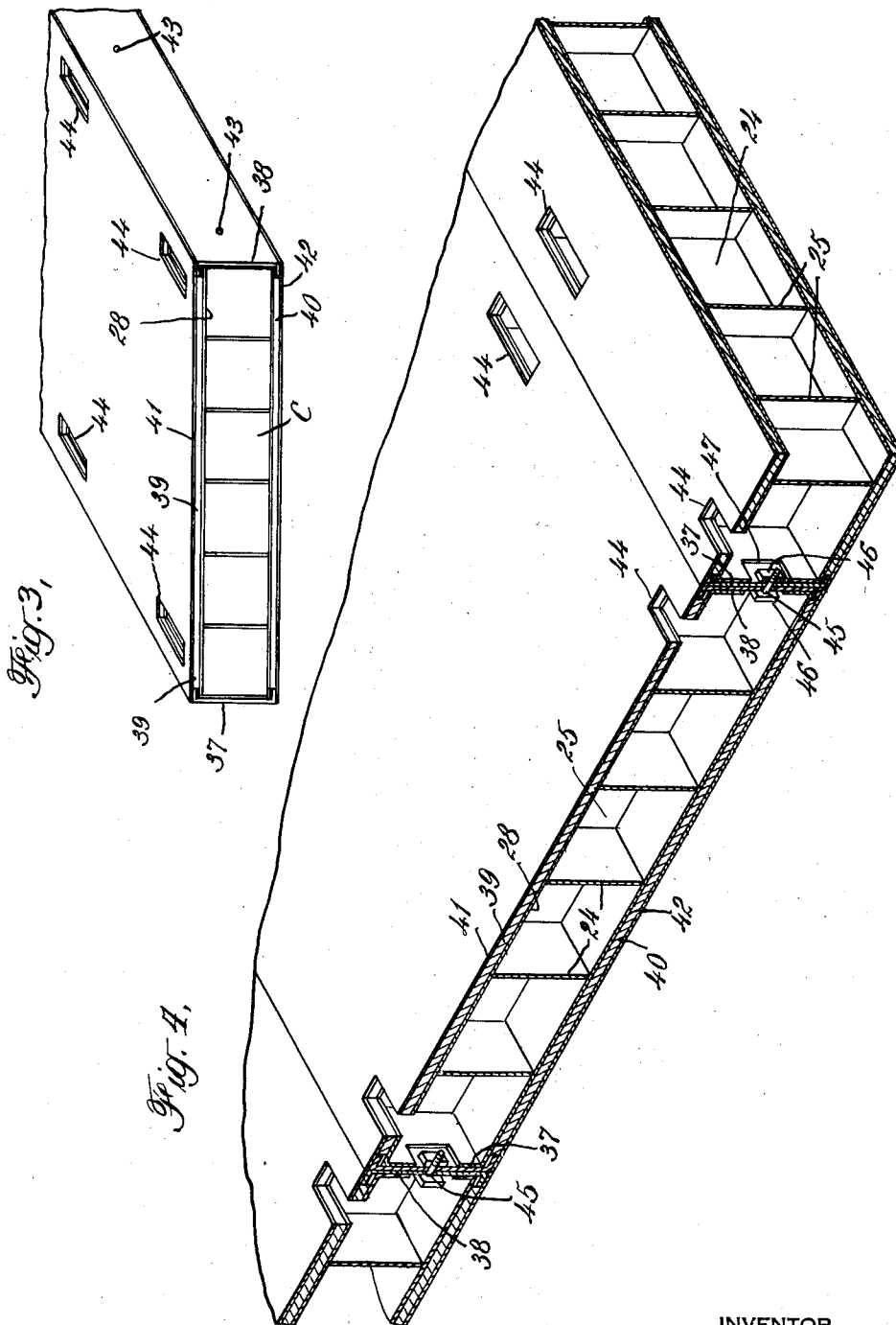
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UNITED STATES PATENT OFFICE

2,299,614

STRUCTURAL UNIT

Maurice Deutsch, New York, N. Y.

Application February 8, 1940, Serial No. 317,929

6 Claims. (Cl. 189—34)

This application is a continuation-in-part of my copending application, Serial No. 145,030, filed May 27, 1937, now Patent No. 2,192,183, issued March 5, 1940.

That application discloses, among other things, a concrete building slab having a hollow core member preferably made of fibrous material. The core member comprises an inner grid having partitions intersecting substantially at right angles to one another and an outer covering extending around at least four sides of the grid.

The present invention relates to structural box-like units having a core member of the type disclosed in said copending application. According to the invention such a core member is positioned within an enclosing structure the side portions of which constitute parallel structural channel portions whose channels face each other and in which the core member is supported, the enclosing structure further having upper and lower portions of sheet material lying above and below the core member. The channel portions and the upper and lower sheets form a hollow structural box-like enclosure for the core which surrounds it on at least four sides.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a perspective view of a section of one of the core members;

Fig. 2 is a broken plan view showing several core members of the kind illustrated in Fig. 1 fastened together end to end to form a longer core member;

Fig. 3 is a perspective view of a structural box-like unit made in accordance with the invention;

Fig. 4 is a perspective view partly in section showing how a number of units like that illustrated in Fig. 3 may be fastened together to form a floor or the like.

Figs. 1 and 2 are taken from the copending application above referred to and illustrate the type of core member which I make use of in the structural unit of the present application. The core member comprises an interior grid having interlocking vertical longitudinal and transverse strips 24 and 25 intersecting substantially at right angles to one another. These strips are preferably made of fibrous material, such as heavy paper or corrugated board. Extending around at least four sides of the grid, i. e., around the top, sides and bottom thereof, is a covering 28 of waterproof sheet fibrous material, or other suitable sheet material. The ends of the sheet material may be joined together in any suitable way as by stapling, or by a strip of tape 29. The core

member shown in Fig. 1 may be considered either a complete core member, or a section of a longer one. Under some circumstances it may be necessary to fasten several of such sections together, end to end, to form a core member of the desired length. For instance, the ends of the longitudinal strips of one section may be glued or otherwise fastened to the ends of the longitudinal strips of an adjacent section, as shown at 30 in Fig. 2, and the meeting edges of the two sections of the outer covering 28 may be joined by a strip of tape 31.

If desired, the grid may be completely covered so as to be entirely enclosed by the outer covering, and a plurality of core members of this type may be laid end to end within the outer casing to be hereinafter described. The grid may be completely covered by cutting off the ends of the longitudinal strips 24 and covering the end portions of the grid with paper or the like.

Figs. 3 and 4 show a core member, similar to that hereinbefore described, embodied in a hollow, light structural unit in which the enclosing structure or outer casing for the core member is made of metal. This is preferably accomplished by positioning two metal channel members 37 and 38 so that the channels face each other, and supporting in the opposing channels of these members a core member indicated in general at c. A layer of insulating board 39 may be positioned over the core member and another layer of such insulating board 40 may be positioned under it. An upper metal sheet 41 is then welded to the upper flanges of the two channel members 37—38 and a similar metal sheet 42 is welded to the lower flanges of these two members. The web of each channel member may be provided with spaced bolt holes 43 to permit the unit to be bolted to another similar unit. Adjacent each bolt hole there is a hand-hole 44 extending through the upper metallic sheet 41, insulating board 39, and outer covering 28 of the core member. Each of these hand-holes communicates with that compartment of the grid with which one of the bolt holes 43 also communicates. Fig. 4 shows several of the units fastened together. Bolts 45 are passed through the bolt holes of the two adjoining units and nuts 46 are threaded on the bolts and tightened to clamp the adjoining units together. The hand-holes 44 afford the necessary access to permit insertion of the bolts and tightening of the nuts. If desired the outer covering 28 of the core member may be cut away as indicated at 47 where the nuts clamp the units together so that the nuts

will bear directly against the metal of the channel members 37-38 instead of against the covering of the core member.

The metal enclosure for the core member provides a more durable and wear resisting surface than the fibrous material of which the core member is made. In some cases it may be desirable to make the metal enclosure out of stainless or rustless steel. The unit has great structural strength and yet it is extremely light in weight. By fastening together a number of units as shown in Fig. 4 various parts of a building may be formed such as the flooring, roofing, walls, partitions, etc., or they may be used as shock-absorbing units or the like. By employing low cost metal the resulting inexpensive, light but strong, units may advantageously be used for the rapid assembling of military structures, such as barracks, storage buildings, pontoon bridges, aeroplanes, etc., each of which may readily be dismantled and reassembled or converted into a structure of a different type.

The interior cells or openings not only make the unit lighter but also add to its insulating properties. By making the core member out of fibrous material further insulation is provided and the weight is kept down to a minimum. Notwithstanding the light weight of the core member it has surprising strength and this feature is taken advantage of to impart the necessary strength to the finished unit and to any structure made by assembling a number of the units.

I claim:

1. A structural box-like unit comprising a pair of channel members spaced apart in parallel relation with the channels facing each other, a core member supported in said channels and comprising an inner grid having partitions intersecting substantially at right angles to one another and an outer covering extending around at least four sides of the grid, sheet material fastened to said channel members and closing the space from each longitudinal edge portion of one channel member to the opposite longitudinal edge portion of the other channel member, said channel members and the sheet material fastened to them forming a hollow structural box-like enclosure for said core which surrounds it on at least four sides, the planes in which the intersecting partitions of the grid lie being at right angles to the planes occupied by the sheet material fastened to the channel members.

2. A structural box-like unit comprising a pair of channel members spaced apart in parallel relation with the channels facing each other, a core member supported in said channels and comprising an inner grid having partitions of fibrous material intersecting substantially at right angles to one another and an outer covering of sheet fibrous material extending around at least four sides of the grid, sheet material fastened to said channel members and closing the space from each longitudinal edge portion of one channel member to the opposite longitudinal edge portion of the other channel member, said channel members and the sheet material fastened to them forming a hollow structural box-like enclosure for said fibrous core which surrounds it

on at least four sides, the planes in which the intersecting partitions of the grid lie being at right angles to the planes occupied by the sheet material fastened to the channel members.

3. A structural box-like unit comprising a pair of metal channel members spaced apart in parallel relation with the channels facing each other, a core member supported in said channels and comprising an inner grid having partitions intersecting substantially at right angles to one another and an outer covering extending around at least four sides of the grid, metal sheets fastened to said channel members and closing the space from each longitudinal edge portion of one channel member to the opposite longitudinal edge portion of the other channel member, said channel members and the metal sheets fastened to them forming a hollow metallic structural box-like enclosure for said core which surrounds it on at least four sides, the planes in which the intersecting partitions of the grid lie being at right angles to the planes occupied by the metal sheets fastened to the channel members.

4. A structural box-like unit comprising a pair of metal channel members spaced apart in parallel relation with the channels facing each other, a core member supported in said channels and comprising an inner grid having partitions of fibrous material intersecting substantially at right angles to one another and an outer covering of sheet fibrous material extending around at least four sides of the grid, metal sheets fastened to said channel members and closing the space from each longitudinal edge portion of one channel member to the opposite longitudinal edge portion of the other channel member, said channel members and the metal sheets fastened to them forming a hollow metallic structural box-like enclosure for the fibrous core which surrounds it on at least four sides, the planes in which the intersecting partitions of the grid lie being at right angles to the planes occupied by the metal sheets fastened to the channel members.

5. A structural box-like unit in accordance with claim 1 having means whereby the unit may be clamped directly to a similar unit.

6. A structural box-like unit comprising an outer metallic enclosure and a core member supported therein, said core member comprising an inner grid having partitions of fibrous material intersecting substantially at right angles to one another and an outer covering of sheet fibrous material extending around at least four sides of the grid, said enclosure having upper and lower sheets of metallic material lying above and below the core member and the side portions of the enclosure constituting parallel metallic structural channel portions whose channels face each other, said channel portions and the upper and lower sheets of metallic material forming a hollow structural box-like enclosure for said core which surrounds it on at least four sides, the core member being supported in the channels of said channel portions so that the planes in which the intersecting partitions of the grid lie are at right angles to the planes occupied by said upper and lower sheets of metallic material.

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