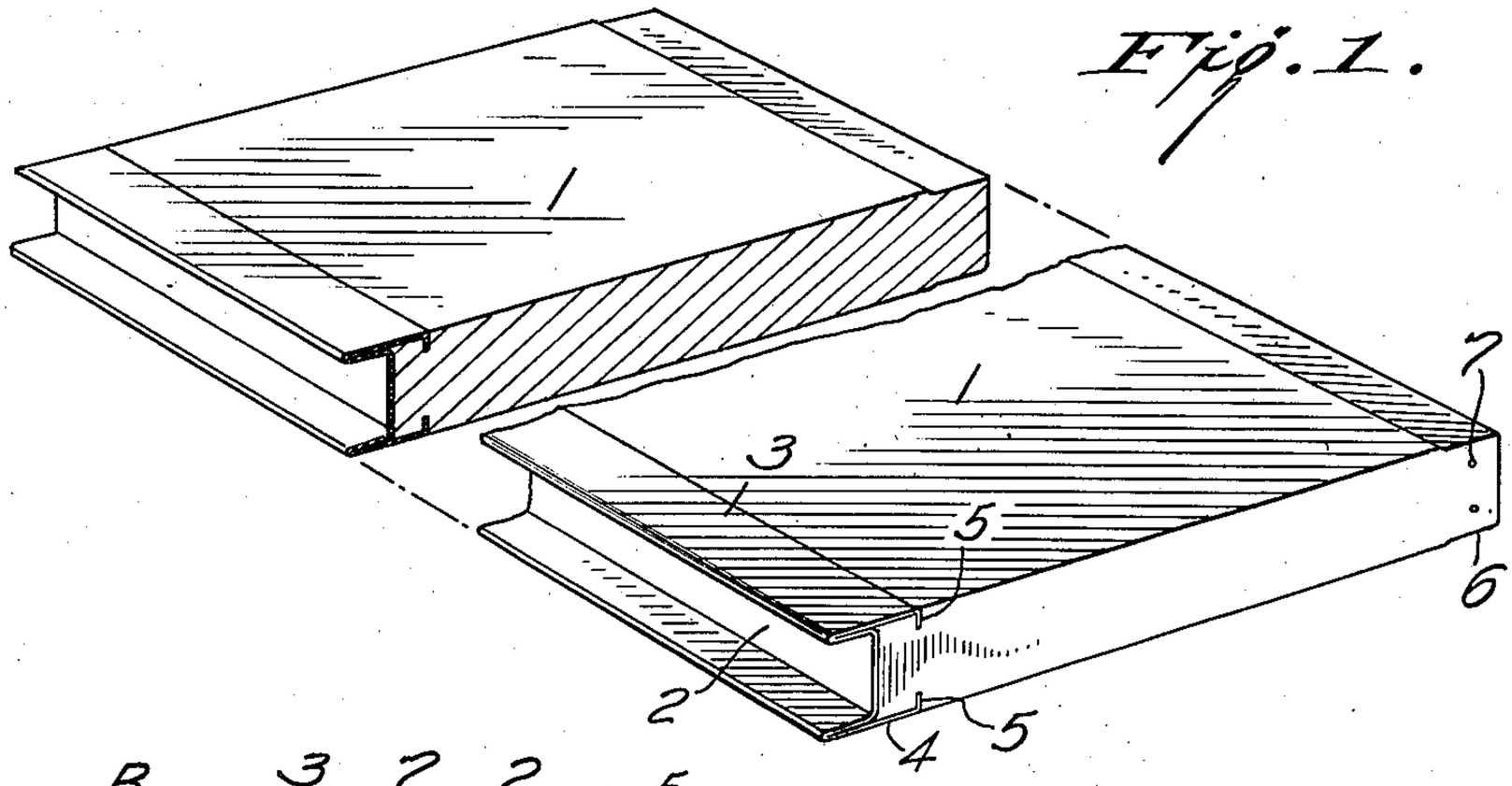
Nov. 26, 1935. R. H. PECK 2,021,922

METAL EDGED SLAB AND BUILDING CONSTRUCTION

Filed May 23, 1933 2 Sheets-Sheet 1

Fig. 1.



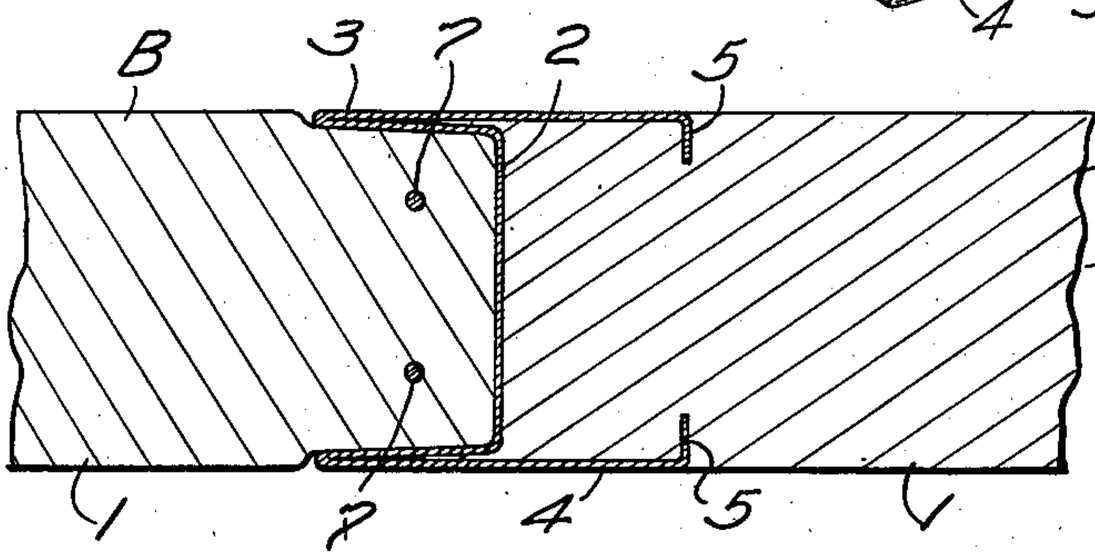
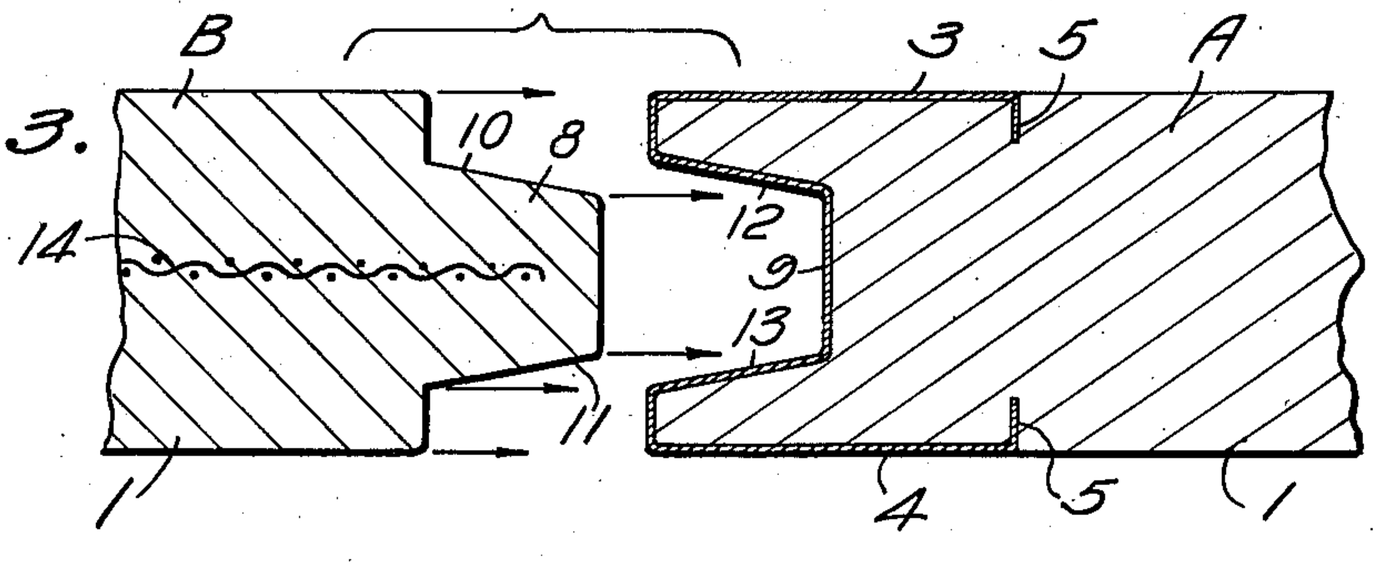


Fig. 2.

Fig. 3.



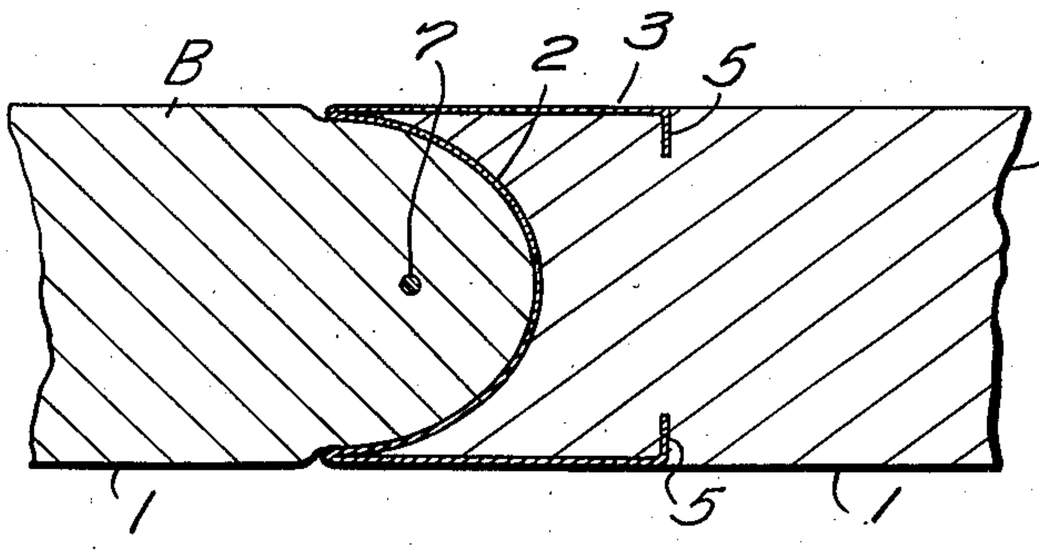


Fig. 4.

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Fig. 5.

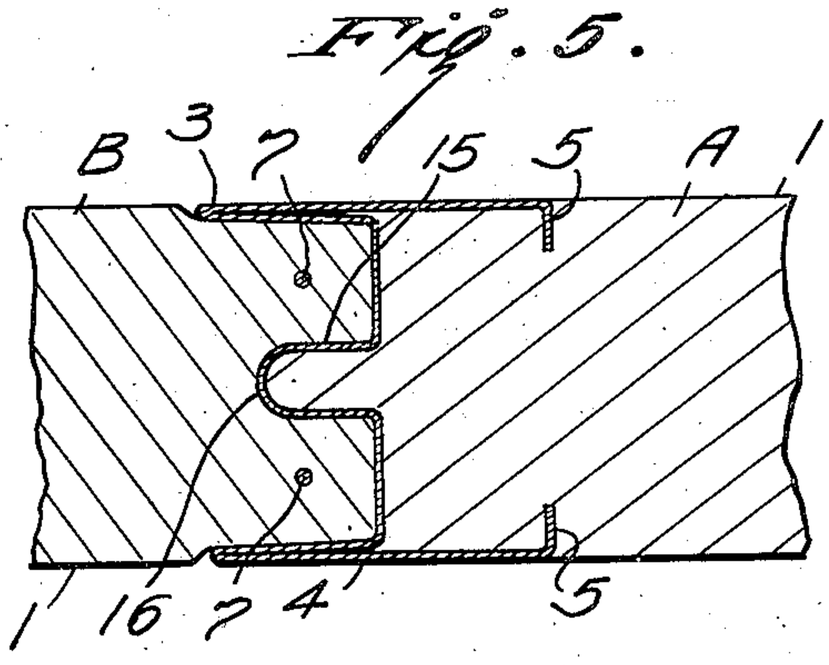


Fig. 6.

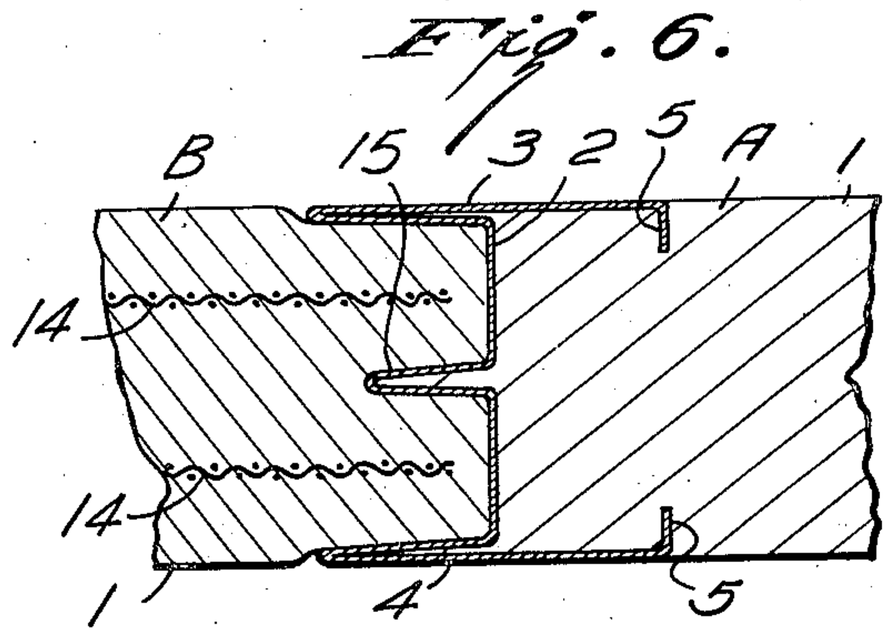


Fig. 7.

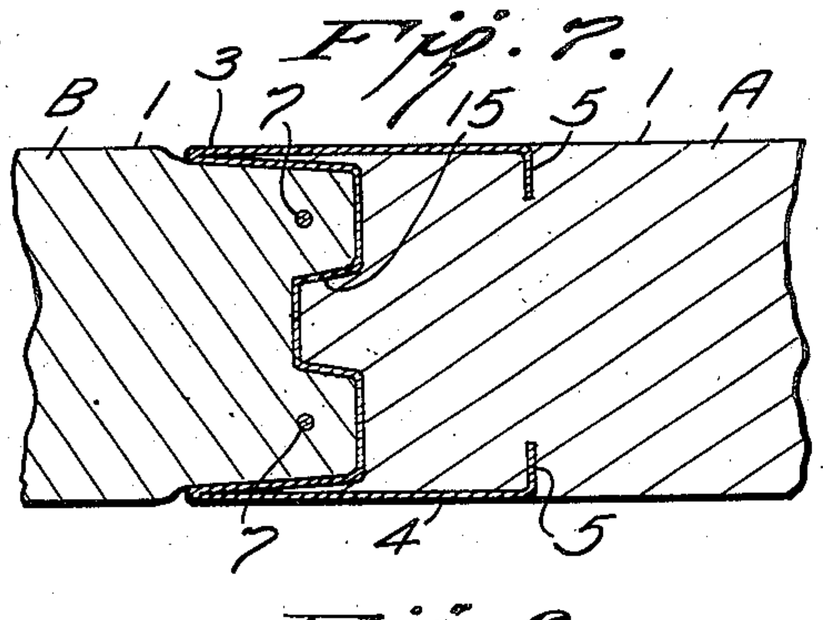


Fig. 8.

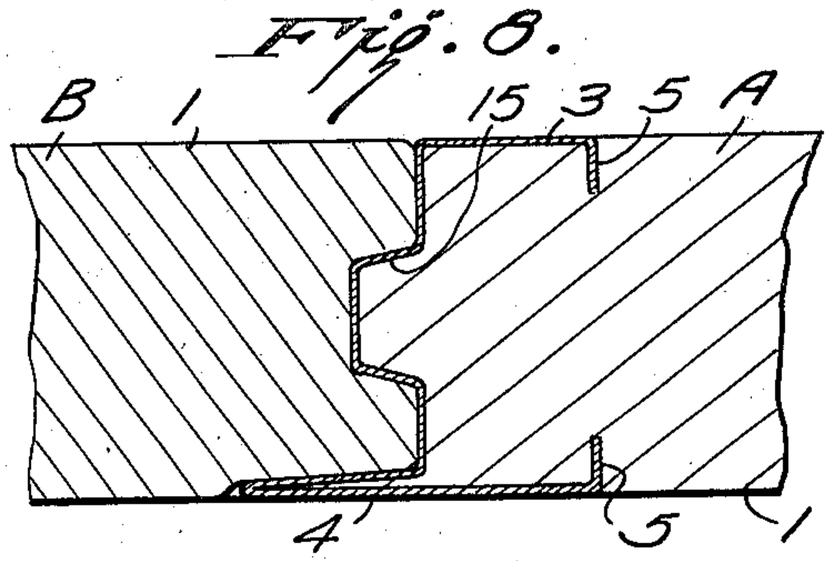


Fig. 9.

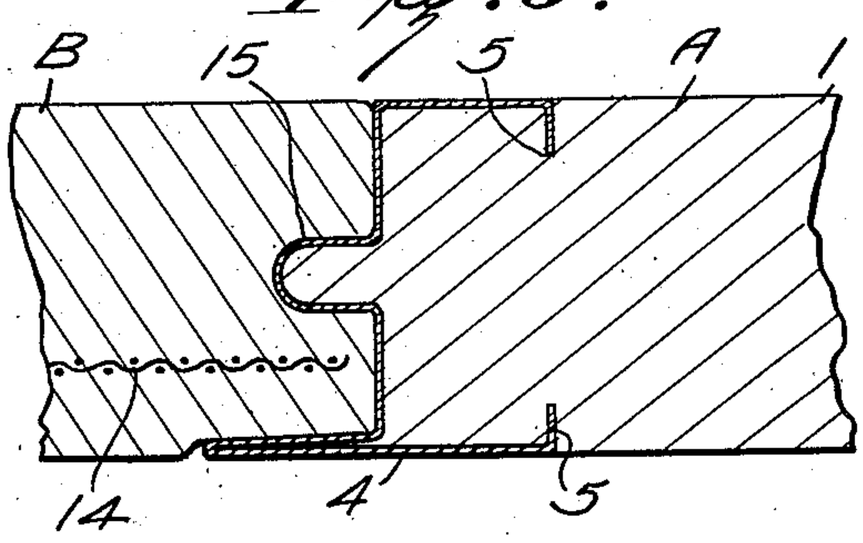
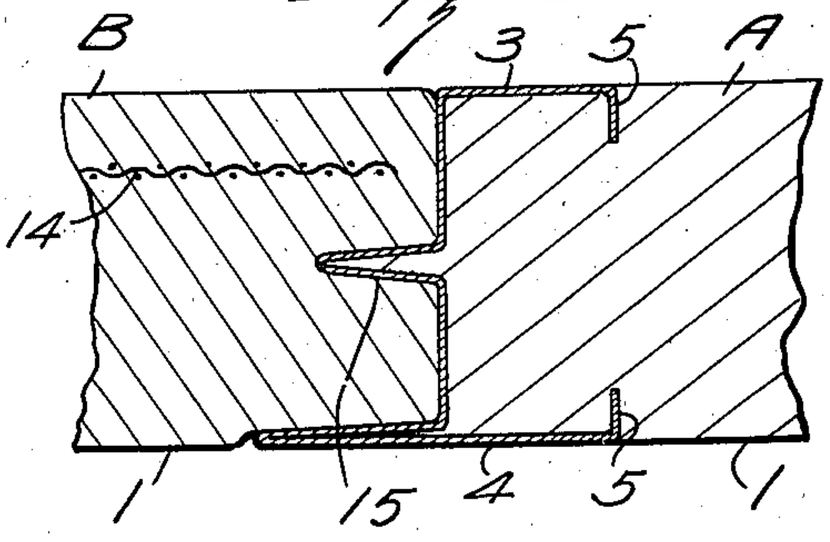


Fig. 10.



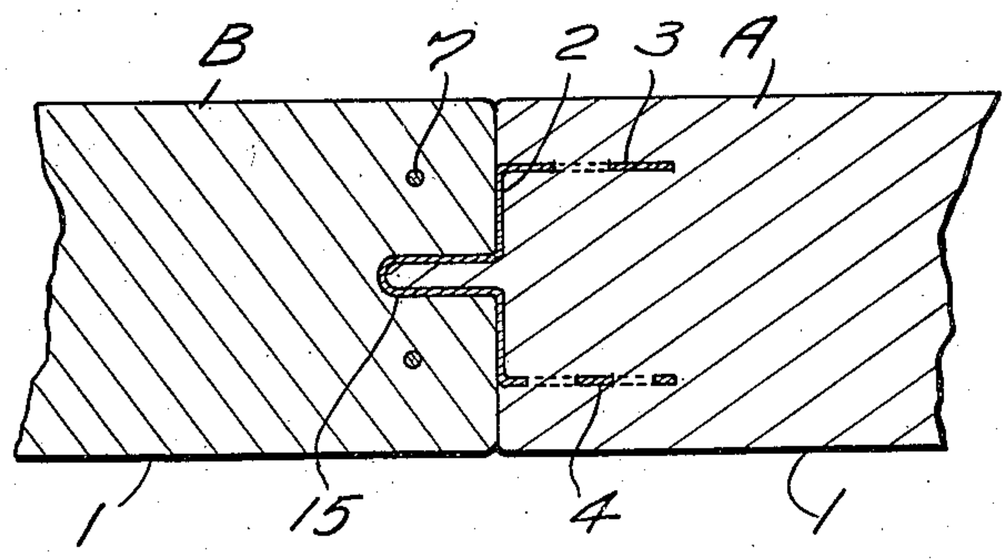


Fig. 11.

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UNITED STATES PATENT OFFICE

2,021,922

METAL EDGED SLAB AND BUILDING CONSTRUCTION

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Application May 23, 1933, Serial No. 672,421

14 Claims. (Cl. 72—68)

My present invention relates to slabs of the precast type where the body thereof is made of set cementitious material of which gypsum with or without fillers and admixtures is but one example.

The present invention is an improvement on the precast slab shown in the patent to Davis, No. 1,854,396.

In that patent there is disclosed a precast slab which is now known to the trade as gypsum lumber or plank having a body of gypsum, opposite edges of the body being surfaced with metal members substantially complementary to each other. As shown in that patent, one of these members is provided with a tongue and the other member with a groove. When two contiguous slabs are erected together with their metal covered edges adjacent, the tongue mates with the groove and forms a very substantial construction, with all of the attendant advantages recited in that patent.

While a gypsum plank constructed according to the teachings of the Davis patent has come into wide use in the trade, there has been a decided need for a product for constructions not required to carry the loads made possible by complementary or mating metal elements but where due to the comparatively great length of said slabs as compared to their thickness, some kind of reinforcing means is required to prevent cracking during handling, or flexing after erection. The primary object of this invention, therefore, is to provide a metal edged precast slab of the gypsum lumber type which will have a requisite strength in excess of that of a similar slab unedged with metal, and which can be made at less cost than a slab having metal on opposite edges, and which can be handled in great lengths without cracking or undue flexing.

To this end the invention contemplates a precast slab of lumber dimensions having one of two opposite edges provided with a metal element, said metal member having either receiving and/or receivable parts, the opposite edge of the slab being unsurfaced with metal and having a shape complementary to that of the metal covered edge. In such a construction, where two slabs are erected together with their complementary edges adjacent, the unsurfaced metal edge mates or inter-engages with the metal covered edge to form a secure interlock therebetween, and due to the shape, dimensions or arrangement of the metal on the metal covered edge, such a construction is capable of developing strength and sustaining loads in excess of slabs not so treated.

Where desired, the unsurfaced edge of the slab may be reinforced by rods, mesh, straps or the like embedded or partially embedded therein.

The invention further consists in the novel arrangement, combination and construction of parts more fully hereinafter described and shown in the accompanying drawings.

In the drawings—

Fig. 1 is a perspective view of a slab constructed according to this invention.

Fig. 2 is a sectional elevation of the joint between two slabs made according to the showing of Fig. 1.

Fig. 3 is a sectional view of a modified form of slab showing the method of inter-engaging two of such slabs.

Fig. 4 is a sectional view showing a modified form of joint.

Fig. 5 is a sectional view showing a modified form of joint.

Fig. 6 is a sectional view showing a modified form of joint.

Fig. 7 is a sectional view showing a modified form of joint.

Fig. 8 is a sectional view showing a modified form of joint.

Fig. 9 is a sectional view showing a modified form of joint.

Fig. 10 is a sectional view showing a modified form of joint.

Fig. 11 is a sectional view showing a modified form of joint.

Referring now with particularity to the drawings and to the embodiment shown in Fig. 1, the slab body of gypsum or the like either with or without admixtures and fillers, is illustrated at 1. Mechanically bonded to one longitudinal edge of the body 1 is a metal element indicated generally at 2 having a vertical web and top and bottom flanges 3 and 4 respectively, the ends of said flanges being returned into the body 1 as by angular bends 5. These bends insure that the metal element will be effectively bonded to the body without relying entirely upon any adherence that might be secured between the face of the metal and the material of which the body 1 is made.

The opposite edge of the slab of Fig. 1 is substantially complementary to the metal covered edge in that it is formed into a tongue 6 which is substantially the thickness of the slab body and this tongue is adapted to be received between the flanges 3 and 4 of a neighboring slab which has been edged with metal as in the left hand edge of the slab of Fig. 1. Such a mating

joint is shown in Fig. 2, in which the slab A has a metal covered edge and the slab B a complementary edge uncovered with metal, the two edges matingly engaging each other in an interlocking joint. Where desired, the uncovered edge may be reinforced as by means of rods or the like 7.

In the form shown in Figs. 1 and 2, a particularly substantial construction is illustrated in that the metal member 2 forms in itself an I beam and as such may develop great strength even though the metal of which the element is made is of a comparatively light gauge. For most purposes an 18 or 20 gauge metal has been found to be of ample strength. The fact that but a single edge is covered with metal, necessarily decreases the initial cost of manufacture of such a slab and yet this type of lumber is applicable to many circumstances where light loads are desired, as for instance in roofs, floors, ceilings, partitions, furring or even in such circumstances as sheathing where no load at all is to be sustained but the interlock is desirable from the standpoint of alignment. Obviously a gypsum slab in extreme lengths with small thickness, cannot be readily handled without breaking as there is so little inherent strength in gypsum. Even when reinforced as by rods, mesh or the like, this handling difficulty is not entirely overcome unless a reinforcement which will structurally resist the bending tendency is used. Such resistance is secured by the use of shapes of this invention.

In Fig. 3 there is illustrated a tongued and grooved joint where the tongue 8 in the slab B is less than the thickness of the slab as is the case in Fig. 1. The slab A is provided with a substantially complementarily shaped metal member having a groove 9 to receive the tongue 8. In such circumstances it is desirable that the surfaces 10 and 11 of the tongue be inclined with regard to each other, to engage substantially similarly inclined surfaces 12 and 13 on the metal member 9 as this serves to wedge the parts together and prevents slippage under load.

Where desired, a reinforcing mesh 14 may be placed in the slab and extended into the tongue 8. This has been found to be desirable in most instances because gypsum is a comparatively fragile material and unless reinforced, a tongue, particularly where it is of comparatively small thickness, has a tendency to fracture. For this reason, the tongue 8 is made of substantial thickness, for instance, a thickness at the base greater than one-half of the thickness of the slab.

In Fig. 4 the web of the metal member attached to slab A takes the form of an ellipse and the uncovered edge of slab B similarly shaped to fit. It is likewise provided with a reinforcement 7. While the web 2 of the metal element in this figure is not arranged in such a position as to give maximum strength, such for instance as is true in the arrangement of Fig. 2, yet, however, for light loads it will be found to be eminently satisfactory because of the inherent stiffness in the metal. It is particularly suitable for partition work, where practically no load is borne, as the rounded end of slab B minimizes breakage and chipping, and yet the mating joint insures perfect alignment.

Figs. 5, 6 and 7 show forms of metal members slightly modified from that of Fig. 1 in that additional tongues are provided between the top and bottom flanges. In Fig. 5 the tongue 15 has parallel walls and a rounded end 16 which assists in inter-engaging the tongue and the corresponding groove in the slab B in a tight joint whether completely mated or not. Reinforcing rods 7 on each side of the groove in slab B materially strengthen these parts and tend to prevent fracture.

In Fig. 6 the tongue 15 of slab A is wedge-shaped in configuration. This forms a most efficient construction, particularly in view of the fact that the interruption in the vertical web is so slight and coincides so nearly with its neutral axis as to be in effect a continuous and uninterrupted web. The configuration of this metal member, therefore, has the practical strength of the metal member of Figs. 1 and 2, while at the same time giving an additional interlocking effect not present in the former figures. A mesh 14 may be extended into the unsurfaced edge of the slab, which lies on each side of the tongue receiving groove.

In Fig. 7 a short, stubby tongue 15 is shown as a modified form.

In Figs. 8, 9 and 10, modifications are illustrated in which the metal element on the slab A does not overlap the unsurfaced edge of the slab B on both faces thereof, but only on a single face. The effect of an overlap on both edges is accomplished, however, by providing the tongues 15 as shown in Figs. 5, 6 and 7. The elimination of one overlapping flange on the metal member has the effect of decreasing the initial cost of the slab. While some strength has been sacrificed, yet this is of no particular moment in many cases as the primary object of the invention is to supply the need of a metal edged slab stronger than a slab not so edged and which is adapted to take light loads.

Fig. 11 shows both overlapping flanges omitted. This construction is desirable where the slabs are to be eventually covered with plaster or other decorative material such as paint or the like. As the metal flanges 3 and 4 are entirely embedded in the gypsum body, there is no difference in suction between adjacent areas as would be the case were plaster or paint applied over the metal and adjacent plaster areas of Fig. 10 for instance. This is a decided advantage. The flanges 3 and 4 being expanded, the plaster body forms an integral mass through such apertures and insures an efficient bond between the metal and the slab body.

Obviously the tongues of Figs. 5, 6, 7, 8, 9 or 10 may be used in the manner shown in Fig. 11 or the flanges 3 and 4 of Figs. 1 to 10 inclusive extended into the body of the material as shown in Fig. 11 instead of being flush with the slab faces.

I claim:

1. A precast slab having a set cementitious body, a metallic member bonded to one edge thereof, said member having either receiving or receivable parts, the opposite edge of said slab body being unsurfaced with metal and having a shape complementary to that of the said metallic member.

2. A building construction including two contiguous slabs each having a set cementitious body with their edge portions adjacent, one of said slabs having a metallic member bonded to one of its body edges, said metallic member having either receiving or receivable parts, the other contiguous slab edge being unsurfaced with metal and matingly engaging the metallic member of the first slab.

3. A precast slab having a set cementitious body, a metallic member bonded to one edge thereof, said member having a groove, the op-

posite edge portion of said body being unsurfaced with metal and having a tongue complementary to the groove in the metallic member.

4. The slab of claim 3 in which the body tongue is substantially the thickness of the slab.

5. The slab of claim 3 in which the metal member is in effect an I beam having an uninterrupted vertical web.

6. A precast slab having a body of set cementitious material, one edge only of said body having bonded thereto a metallic member having a vertical web, a flange at one end of the web projecting on one side thereof only, and another flange projecting on each side thereof.

7. The slab of claim 6 in which the opposite body edge is unsurfaced with metal and is provided with a cutaway portion complementary to a portion of the flange which projects on each side of the web of the metal member.

8. A precast slab having a set cementitious body, a metallic member bonded to one edge thereof, said member having a tongue, the opposite edge portion of said body being unsurfaced with metal and having a groove complementary to the tongue in the metallic member.

9. The slab of claim 1 in which the metal member is in effect an I beam.

10. The slab of claim 3 in which the tongue and groove are each segments of an ellipse.

11. The slab of claim 3 in which the metallic member has a parallel walled tongue projecting from a vertical web.

12. The slab of claim 3 in which the metallic member has a tapered tongue projecting from a vertical web.

13. A precast slab having a set cementitious body, a metal member bonded to one edge of said body having a vertical web and a flange at each end of said web, said lower flange including a portion of double thickness projecting outwardly beyond the slab body, the opposite edge of the slab body being unsurfaced with metal and having a cutaway portion substantially corresponding in extent with the double thickness flange of the metal member.

14. A precast slab having a set cementitious body, a metal member bonded to one edge only of said body, said member having a vertical web of less extent than the body thickness and an intermediate outwardly projecting tongue having substantially parallel top and bottom surfaces, and flanges at each end of the vertical web extending into the slab body, said flanges having perforations therein, with the slab body integrally extending therethrough, the opposite edge of the slab being unsurfaced with metal and having a groove substantially complementary to said metallic tongue.

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