

Feb. 8, 1944.

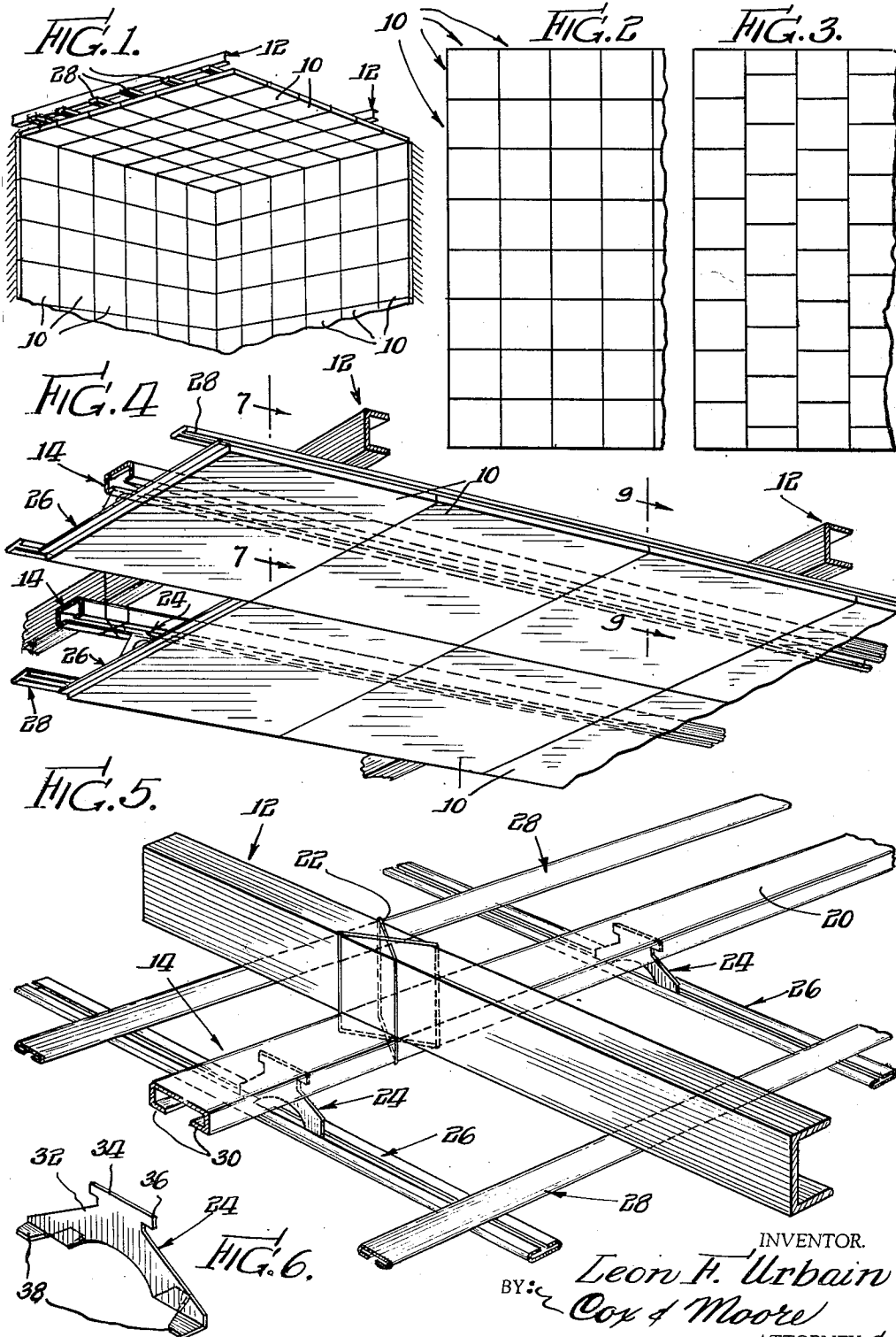
L. F. URBAIN

2,340,911

MEANS FOR ASSEMBLING CONSTRUCTION UNITS

Filed Oct. 18, 1939

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 7.

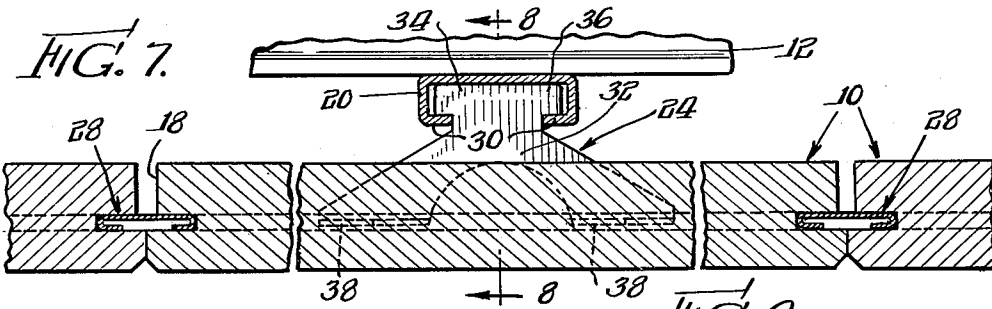


FIG. 8.

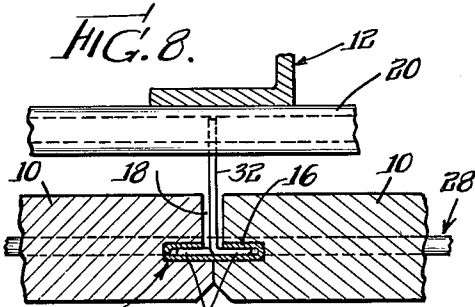


FIG. 9.

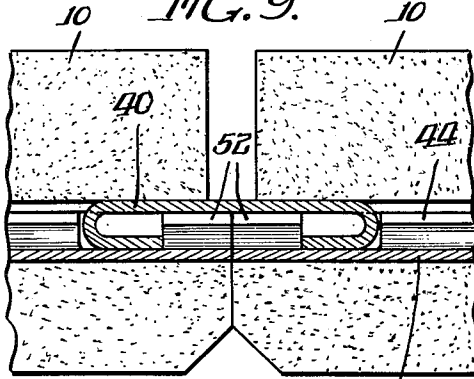


FIG. 10.

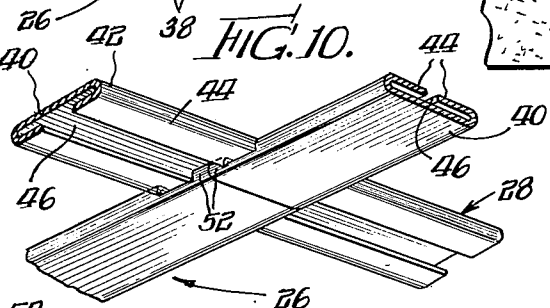


FIG. 11.

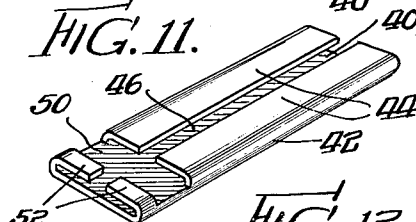


FIG. 12.

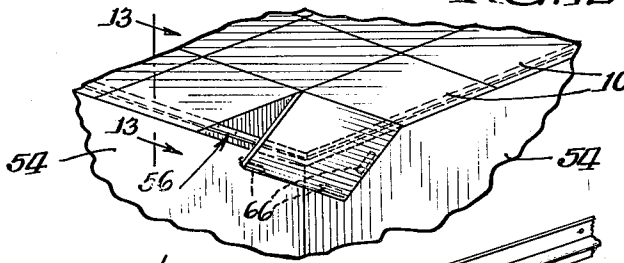


FIG. 13.

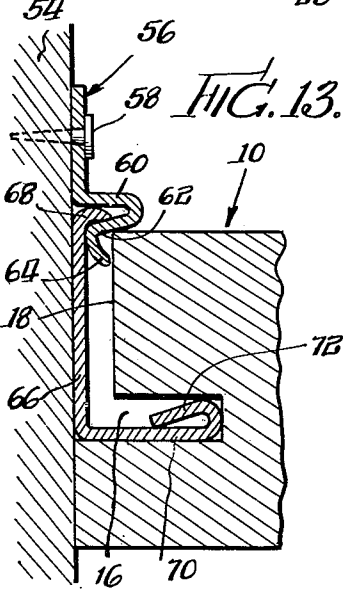
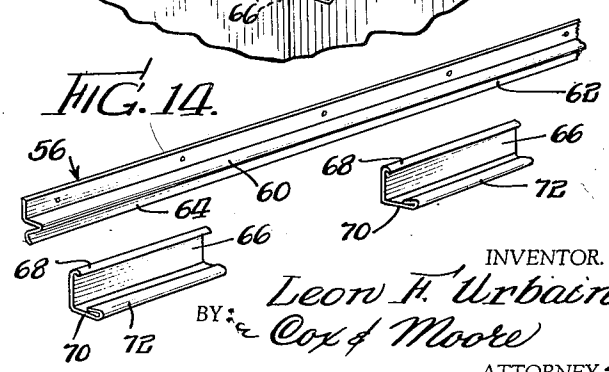


FIG. 14.



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UNITED STATES PATENT OFFICE

2,340,911

MEANS FOR ASSEMBLING CONSTRUCTION
UNITS

Leon F. Urbain, Chicago, Ill.

Application October 18, 1939, Serial No. 299,926

20 Claims. (Cl. 72-118)

The present invention relates to the assembly of walls and surfaces from construction elements and, more specifically, to the combination of surfacing or sheathing units on a supporting frame or partition.

It is within the contemplation of the present invention to provide a new and improved method for permanently assembling wall slabs or other construction units, which method is rapid in application and which is carried out with simple and inexpensive construction elements whereby the cost of construction is lowered.

Yet more particularly the present invention relates to that type of wall slab or surfacing unit provided with a kerf which, for purposes of illustration in accordance with the following specification and claims, will be referred to as acoustical tile. Such units are normally supplied in geometrical shapes of predetermined dimension, the peripheral kerf permitting the introduction of a spline at all peripheral margins for providing a breathing stop. In the past, considerable difficulty has been experienced in assembling these units. Nailing is impractical and unsightly and cannot be employed in conjunction with many conventional sub-walls or supporting frames. Adhesive glues are structurally undesirable, impermanent and are often attacked by alkali in plaster cement. Mechanical systems of attachment have been unsatisfactory in view of the obvious difficulty of positively interlocking the entire periphery of each construction unit with means which is permanently mounted interiorly of the finished wall.

It is an important object of the present invention to overcome the foregoing difficulties by providing means for the assembly of acoustical tile in positive engagement with the sub-wall or supporting frame such that construction proceeds by simple inter-engagement of the several construction elements and wherein the parts become positively inter-connected with each other and with the supporting frame as assembly progresses.

Yet more particularly it is an object of the present invention to provide an inter-engaging construction as above, as well as means facilitating this said construction wherein each of the individual tiles is inter-locked with or held positively against each adjacent tile section in predetermined relationship to positively resist separation at all times. To this end there is contemplated a provision of splines and runners in inter-locking engagement when disposed in tile embracing position.

Another important object of the present invention contemplates the provision of simple and inexpensive splines and runners which splines are adapted to receive, preferably removably, known attachment clips for association with the supporting frame.

The invention further contemplates the inter-association of the clips, splines and also the supporting structure over a wide range of positions to compensate for any slight dis-alignment occurring in the plane of the finished wall. In other words, it may be said that, in accordance with the present invention, construction is greatly facilitated by virtue of the fact that the dispositioning of the clips with respect to the splines is uncritical and relatively unimportant since, in accordance with the present construction, the wall surface is automatically self-aligned and the clips, in general, provide a supporting, spacing function.

The object of the present invention comprises the provision of an improved inter-locking connection for supporting the so-called last or end row of tiles with respect to a transversely extending wall and contemplates an inter-engaging clip and runner construction completely retained within the outer surface of the finished wall for inter-engagement with the adjacent peripheral spline.

Yet other and further objects will be more apparent from the following detailed description when considered in connection with the accompanying drawings, wherein

Fig. 1 is a perspective view of a room showing the ceiling construction embodying the principles of the present invention.

Figs. 2 and 3 are detailed, planned views of wall or ceiling surfaces formed of acoustical tile, the former view showing the tile arranged according to the so-called matched joint style, whereas the latter figure shows the so-called staggered arrangement of the tile.

Fig. 4 is a detailed, perspective view of a portion of the partition shown in Fig. 2, the surrounding parts having been broken away to illustrate the internal construction.

Fig. 5 is a perspective view similar to Fig. 4 taken from above showing tile units removed for the purpose of illustrating the cooperation of the tile supporting and engaging members.

Fig. 6 is a perspective view of an attachment clip employed in accordance with the present invention.

Fig. 7 is a detailed view taken vertically on the line 7-7 of Fig. 4.

Fig. 8 is a detailed view taken on the vertical line 8-8 of Fig. 7.

Fig. 9 is a detailed view taken vertically adjacent the juncture of the corners of adjacent tiles of the line 9-9 of Fig. 4.

Fig. 10 is a perspective, detailed view of traversing splines showing their means of inter-connection.

Fig. 11 is a perspective, detailed view of the extremity of one of the transverse splines.

Fig. 12 is a perspective view similar to Fig. 1 illustrating the method of assembling the last row of tiles.

Fig. 13 is a sectional view taken on the vertical line 13-13 of Fig. 12.

Fig. 14 is a perspective view of the inter-locking runner and clip members for supporting the aforesaid last row of tiles.

Referring now to the drawings wherein the present invention is illustrated more in detail, Figs. 1 to 4 and 7 to 9 illustrate ceiling constructions comprising aligned acoustical tile slaps or units 10 secured to a supporting frame or wall construction comprising sleepers 12 by means of a structural assembly indicated generally by the reference numeral 14. The so-called acoustical tiles 10 contemplated may be, and preferably are, for purposes of illustration, best represented as those conventional elements formed from compacted fibrous material and therefore relatively soft. It is to be understood, however, that the invention is not so limited in scope of application, but is applicable with equal facility to construction and assembly of so-called tiles formed of any other material such, for example, as cork, composition, or even ceramic materials such as baked clay.

As clearly indicated in Figs. 7, 8 and 9, each of the rectangular units 10 has a peripheral kerf or slot 16 disposed between its front and rear surfaces and, in accordance with the usual practice, the rear flange or tongue defined by the kerf 16 is relieved or cut back as at 18.

The structural supporting assembly 14 comprises a supporting channel or rail 20 secured to the spaced frame members 12 by wire loops 22, although it will be understood that any equivalent fastener means may be employed. The rails or channels 20 engage the entire final assembly of acoustical tiles with the frame 12 through the agency of attachment clips 24 engaging within transverse splines 26 which, in turn, interlock with longitudinal runner splines 28. To this end the channel 20 comprises oppositely in-turned sections or lips 30 spaced at a predetermined distance to permit entry of the base portion of the clip 24. For inter-engagement with the channel, each clip, at the upper extremity of its web 32, has a base or attachment portion 34 providing lugs or ears 36 extending outwardly for engagement behind the flanges 30 of the channel 20, as clearly illustrated in Figs. 4, 5 and 7.

The web 32 extends downwardly away from the base any determined distance and terminates in oppositely laterally extending prongs 38 for association with the transverse splines 26. It is particularly important to note that the height of the clips 24 may involve any desired dimension in accordance with the desired spacing between the channels and the final wall surface. The prongs 38 moreover may be disposed in substantially marginally spaced relation, since I have found that this construction contributes to the stability and rigidity of final construction.

For more detailed description of the instant acoustical tile clip, reference is made to my patent, No. 2,125,579, wherein the clip per se is disclosed and claimed.

The longitudinal runner splines or strips 28 comprise elongated members formed by folding over a flat sheet of metal to provide a rear wall 40, short lateral marginal walls 42, which may be, and preferably are, curved, and in-turned lips or flanges 44 disposed in spaced, longitudinal parallelism as at 46. It will be obvious from the foregoing and from the figures of the drawings that the in-turned flanges 44 provide recesses which embrace the prongs 38 of the clip and restrain the clip for longitudinal sliding movement.

Attention is particularly directed to the fact that the transverse or clip-receiving splines 26 are cut to a longitudinal dimension equivalent to the transverse peripheral width of the tile section, as clearly indicated in Figs. 7, 9 and 10, while the longitudinal splines or runners 28 disposed in normal position thereto are preferably continuous lengths of considerably larger dimension providing any dimension for convenient handling. As shown in Figs. 7, 9 and 12 moreover, the so-called transverse splines 26 are relieved adjacent each end to cut away a predetermined longitudinal portion 50 of the flanges 44 and associated marginal walls 42 equivalent to the width of the in-turned flange portion 44 on the angularly disposed marginal runner strip 28. The cut away portion 50 is disposed sufficiently from the extremity of the spline to leave locking or engaging portions 52 for engaging within the central longitudinal groove of the runner spline 28. Thus it will be obvious that the engaging tongues 52 must have a longitudinal width permitting them to be accommodated within the slot 46 of transverse members, and where adjacent splines engage the runners in alignment, and the width of the tongues 52 must be less than half of the width of the slot 46. From the foregoing it will be obvious that each transverse spline positively engages with both lateral runner strips. In other words, in the final assembly each of the tile kerfs is occupied by a spline strip and the so-called transverse strips 26 occupying the opposite end kerfs of each tile unit positively inter-engage at their extremities with the runner splines which reside in the angularly disposed kerfs along the lateral margins of the tiles.

From the foregoing it will be apparent that the tiles are not only positively disposed with respect to the supporting frame but that they are positively held against lateral relative separation or displacement. That is to say, by virtue of the disposition of the interengaging transverse splines within the narrow confines of a slot or kerf positive engagement is permanently effected. At the same time it will be recognized that a certain amount of frictional inter-engagement between the clip and the rail or channel 20 maintains the tiles together in angularly disposed directions. While the foregoing specific illustration concerns the provision of so-called matched joint wall constructions, it will be obvious therefrom that the staggered construction shown in Fig. 3, as well as others, is equally available in accordance with the mere relative location of the units during assembly.

From the foregoing it will be apparent that the aforesaid structure may be provided by merely progressively associating the parts.

Thus, starting at any margin or other portion of the wall, as desired, the clip 24 associated with the transverse spline 26, as shown, is inter-engaged with the channel 20 by disposing the plane of the web 32 longitudinally of the channel to permit the base portion to pass thereinto and then rotating the assembly until the base extends into transverse inter-engagement, as shown in Fig. 7. A marginal kerf of an acoustical tile and a second clip and spline assembly engaged with the channel 20, as before, are brought into association with the marginal kerf. A continuous column or line of rectangular tiles is built up in this manner, after which the runner splines 28 are forced into the lateral marginal kerfs where they are positively engaged by the transversely extending spline, as aforesaid. Subsequent lines or columns are built up in the same manner until the entire wall or surface is completed.

In order to overcome the long-standing difficulty inherent in assembling the final row or column of units wherein a lateral wall or abutment intervenes, I have provided an improved construction, shown in Figs. 12 to 14, comprising a runner and clip construction. Thus, in Figs. 12 and 13, a ceiling is shown for purposes of illustration bounded by vertical walls 54 against which the last row of tile must abut and necessarily be supported. The horizontal strip or runner 56 fastens to the wall 54 as at 58 and comprises a downwardly extending flange terminating in a lower latch portion comprising an outwardly extending, yieldable flange 60, a reversely extending lug 62, and a downwardly and outwardly inclined clip impinging portion 64. The clip, which is adapted for association with the tile unit 10, comprises an upwardly extending flange 66 terminating in a marginal, laterally disposed lip 68. The lower extremity of the wall 66 is flanged as at 70 and reversely beaded as at 72. As clearly shown in Fig. 13, the bead 72 and the flange 70 are adapted for disposal within the kerf 16, whereupon the wall section 66 extends within the space provided by relieving or offsetting the rearward margin of the tile as at 18. With the clip receiving strip arranged as shown in Fig. 12, and the clip located within the kerf 16, the tile may be merely angularly shifted upon the opposite spline strip as a fulcrum to bring the clip into association with the wall mounted runner, as shown in Fig. 13. The yieldability of the parts 60 to 64 permits permanent inter-engagement. Such a fastening strip construction may be employed to support the tile unit along the transverse margins where desired, and is indicated in Fig. 13, although such is ordinarily not a necessity.

It is to be noted that any number of clips may be arranged within the kerf, or a continuous clip member may be employed.

I have further discovered in unusual installations wherein sufficient space is not available to attach the clip receiving strip, as shown in Fig. 3, that this may be disposed within the marginal planes of the tiles by merely shortening the height of the clip, to-wit, the height or length of the flange 66. Under such circumstances it is obviously necessitated that the inner margin of the tile be further relieved or offset to receive the outwardly projecting portions 60, 62 and 64.

The foregoing invention relates to and provides for an improved means for the rapid assembly of kerfed constructional units into an assembled wall surface and particularly a surface

wherein the parts are all positively inter-joined or otherwise rigidly held together. It is moreover important to note that a breathing stop means is located at all lines of juncture. In accordance with the described self-aligning features of construction, original disposition by virtue of the adjustability is provided between the clip and supporting splines as well as between the supporting channel and clip. It is of great practical importance moreover that the tile units all remain positively supported at all times after the transverse splines are received by the opposed marginal kerfs. There is afforded no opportunity, therefore, for inadvertent disassembly and the possible release of a portion of the previously assembled wall such as has occurred in accordance with previous known practice. In other words, the present invention promotes the rapid, efficient and positive assembly of a ceiling construction, for example, by virtue of using as suspending members transverse splines which are relatively short and thus can be adjusted laterally, longitudinally and angularly with great facility to engage the associated tile units. These short, radially assembled splines accordingly positively support the assembled ceiling units independently of the association therewith of the longitudinal runner splines, thus facilitating installation and decreasing the labor costs and uncertainty hitherto attendant the assembly of these units.

Particular attention is directed to the fact that all of the spline members may be, and preferably are, in accordance with certain preferred embodiments of the present invention, formed of the same sectional configuration so that they may all be formed from the same length of stock. In other words, the relatively short, transverse splines 26 may, in accordance with this procedure, be formed by merely cutting them from the length of spline stock and notching their extremities as at 50. On the other hand, the present invention is not so limited and contemplates, where desired, the use of lateral and longitudinal spline strips differing respectively in spacing between the in-turned edges. Thus, the in-turned edges of the transverse spline member 26 may be brought relatively closely together to accommodate the thin central web of the hanger clip 24, while, as clearly pointed out before, the spacing of the opposed lips or flanges on the longitudinal spline should be such as to accommodate the shoulders 52 formed by notching the transverse splines. Stated in another way, the lip spacing of the runner spline members may be, and preferably is, maintained within relatively wide limits to permit the association of inter-engaging shoulder portions 52 of substantial extent and rigidity. In accordance with either embodiment, however, it is to be pointed out that the final construction proceeds rapidly and positively and that the final wall or ceiling is permanently and positively located.

Further attention is directed to the fact that, in accordance with the present invention, angularly disposed splines are oppositely faced and it is this oppositely facing disposition of the particular spline herein provided that promotes and enables the interlocking engaging action. Thus, first of all, I provided splines and then I discovered that by oppositely arranging these splines where the slots cross at an angle and by additionally transversely notching one of the splines, means for positive lateral interengagement is provided when the splines are operatively em-

braced within the contiguous kerfs of the aligned construction units.

It is thought that the invention and numerous of its attendant advantages will be understood from the foregoing description and it is obvious that numerous changes may be made in the form, construction and arrangement of the several parts without departing from the spirit or scope of the invention, or sacrificing any of its attendant advantages, the form herein described being a preferred embodiment for the purpose of illustrating the invention.

The invention is hereby claimed as follows:

1. For use in a wall or covering construction comprising a plurality of kerfed wall construction units arranged in adjacent, continuous relationship, spline means for association with contiguous kerf means on opposed, adjacent units, and a supporting clip for attachment to a supporting base construction, longitudinally extending guide means on said spline and complementarily inter-engageable guide means on the clip receivable by said first named guide means for movement longitudinally of the spline for restraining said clip for slidable movement in a path disposed longitudinally in respect to said spline, said spline being relatively flat for disposition completely within contiguous kerfs, said clip being formed of sheet material and extending laterally from the spline for disposition between kerfed portions of the building units to a relatively remote point of attachment.

2. A supporting structure for kerfed wall construction units comprising an elongated, substantially flat spline member and providing a guide channel disposed longitudinally of said spline, and a clip for association therewith, said clip comprising a base adapted for attachment to a supporting frame, an extension from said base, and prong means projecting laterally from said extension and inter-engageably receivable within said guide channel.

3. A combination for locating and supporting kerfed structural units comprising an elongated, substantially flat spline member for reception within contiguous kerfs and providing a guide channel disposed longitudinally of said spline, and a clip for association therewith, said clip comprising a base shaped to fit slidably within an inter-engaging channel support, an extension from said base for protruding from said channel and prong means projecting laterally from said extension at a point relatively remote from said base, said prong means being receivable within said guide channel for positive inter-engagement therewith while permitting relative, longitudinal adjustment of said clip.

4. A supporting structure for kerfed wall construction units comprising an elongated, substantially flat spline member and providing a guide channel disposed longitudinally of said spline, and a clip for association therewith, said clip comprising a sheet metal member having a base for positive sliding inter-engagement with a support channel, a sheet web extension projecting from said base, and lateral prongs disposed at a predetermined line for slidable inter-engagement within said guide channel.

5. A construction unit for supporting kerfed structural elements in contiguous, splined relationship, said construction unit comprising a relatively flat, elongated spline member, said spline having a groove extending laterally in the plane thereof, said groove extending between opposite lateral margins of the spline and being arranged

adjacent the extremity of said spline but spaced from said extremity a predetermined distance to provide a retaining shoulder for engagement with a transversely extending recess and spline member.

6. A construction element for inter-engaging and supporting kerfed structural wall units in contiguous relationship, said element comprising a spline formed of elongated strip sheet material having its margins, reversely bent and spaced to provide an internal clip receiving channel, said spline having adjacent its extremity a groove disposed transversely in the plane of said spline but spaced from said extremity to provide inter-engaging shoulder portions.

7. A construction element for inter-engaging and supporting kerfed structural wall units in contiguous relationship, said element comprising a spline formed of elongated strip sheet material having its margins reversely bent and spaced to provide an internal clip receiving channel, said spline having adjacent its extremity a groove disposed transversely in the plane of said spline but spaced from said extremity to provide inter-engaging shoulder portions, and a second spline member adapted to extend at an angle to said first-named spline, said second spline having longitudinally disposed recess means for receiving said shoulder portions.

8. In combination, a structural spline assembly for engaging and supporting wall construction units in adjacent, continuous relationship, said spline assembly comprising a relatively flat, elongated spline member having a laterally disposed groove providing a recess extending in the plane of said spline but spaced from the extremity thereof to provide a retaining shoulder, a second spline for angular disposition with respect to said first-named spline, said second spline having a longitudinally disposed recess in which said shoulder is receivable, and longitudinally disposed projecting means defining one margin of said recess and proportioned for disposal within said groove whereby said angularly disposed splines are positively interengageable.

9. A construction clip for engaging kerfed wall construction units with suitable supporting means, said clip comprising an elongated member formed of sheet material with a longitudinally extending substantially flat kerf-engaging flange, said kerf-engaging flange being formed adjacent one lateral peripheral margin with a reversely formed kerf-engaging bead bent upon itself and disposed substantially in the plane of the flange, the oppositely disposed lateral margin having a laterally extending supporting flange adapted to overlie the kerfed marginal construction when the said flange is embraced within a kerf, and a longitudinally disposed projecting means on said wall in spaced relation to said flange for engagement with holding means.

10. A structural retaining clip construction for inter-engagement with a complementary clip associated with a kerfed wall construction unit and comprising elongated attachment flange means adapted for securement to a wall or the like, and outwardly and reversely extending loop means formed adjacent a lateral margin of said flange for embracing a portion of said complementary clip, and longitudinally extending guide lip means disposed along the margin of said reversely extending portion, said guide lip being curved outwardly to provide a guide surface and being yieldable outwardly beyond the plane of said attachment flange to accommodate said co-

operating clip in adjacency to the attachment flange as a fixed abutment.

11. In a wall or covering structure for buildings comprising spaced wall units having angularly disposed peripheral marginal edges provided with complementary kerfs in contiguous relationship, a supporting frame for said wall, a wall supporting member operatively supported by said frame and spline means to spline means, said spline means being positively embraced within marginal peripheral kerfs formed adjacent transversely extending edges of said wall units, longitudinally extending spline members associated with kerf means formed adjacent the angularly extending peripheral margins of said wall units, means on said transversely extending splines and said longitudinal splines interengaging said splines against displacement laterally with respect to said longitudinal splines whereby to positively associate longitudinally extending groups of wall units against lateral separation.

12. In a wall or covering structure for buildings comprising spaced wall units having angularly disposed, peripheral, marginal edges provided with complementary kerf formations, angularly disposed spline members located within said kerf constructions for supporting said units, said spline members being longitudinally slotted, splines extending in one direction being disposed with said slot facing laterally with respect to the plane of said wall in a predetermined direction, and angularly disposed splines having their slots oppositely laterally facing and being notched for inter-engagement with said first-named spline.

13. In a wall or covering structure for buildings comprising spaced wall units, an elongated spline member providing a guide channel disposed longitudinally of the spline, a clip for association therewith, said clip having portions projecting laterally and interengageably receivable within said guide channel, and a supporting channel for said clip, said clip having a base portion and said supporting channel having walls providing a guideway disposed longitudinally of the channel, said base portion of the clip having parts receivable in said guideway for restraining said base portion for movement laterally of said channel member.

14. A wall or covering structure as defined in claim 13 wherein said spline and supporting channel are angularly disposed and wherein said clip is slidably engaged with said spline and supporting channel for relative movement longitudinally thereof.

15. In a wall or covering structure for buildings comprising spaced wall units, an elongated spline member providing longitudinally extending guide means thereon, a releasable interengageable clip for supporting the spline and having complementarily interengageable guide means receivable by said first named guide means for movement longitudinally of the spline and being interengaged with said spline against lateral separation and shiftable freely longitudinally thereof, and a supporting channel for said clip, said clip having a base portion and said supporting channel having walls embracing said base portion on substantially all sides thereof and restraining said base portion for movement laterally of said channel member.

16. In a wall or covering structure for use in a building comprising spaced wall units, a supporting channel for said units, elongated spline

means angularly disposed relatively to said supporting channel and adapted for association with contiguous kerf means on opposed adjacent units, and a clip for attaching the spline means in spaced relation to the channel, said channel and spline means each being provided with longitudinally extending guide means formed thereon, said clip being formed with spaced complementarily interengageable guide means receivable respectively by said guide means on the spline and on the channel for associating said clip with said spline means and channel for movement longitudinally thereof and for restraining said clip from lateral slidable movement relative to both the spline means and the channel.

17. A construction as defined in claim 16 wherein said respective guide means on the clip are arranged so that the spline is disposed at substantially right angles to said channels.

18. A construction unit for supporting kerfed structural elements in contiguous splined relationship, said construction unit comprising a relatively flat elongated sheet metal spline provided with a longitudinally extending central channel, said spline on opposite sides of the channel, and extending longitudinally thereof and in parallel relationship, including overfolded flanges providing overhanging edges spaced from the main body of the spline, the overlying edges of the spline adjacent but spaced from one end being omitted to provide a transversely extending channel of sufficient width to receive a portion therein of a separate angularly disposed spline, said first mentioned spline between its end and said cross channel being provided with a pair of inwardly extending integral lugs having inner edges spaced apart centrally of the spline for positively engaging channel portions of said second mentioned spline.

19. A construction unit for supporting kerfed structural elements in contiguous splined relationship comprising an elongated sheet metal body having its opposed longitudinal edges folded over upon and spaced from the sheet metal stock of the body and spaced apart centrally longitudinally thereof to provide a longitudinal slot opposed by overhanging flanges formed by said folded over edges, an end of the unit having the metal of the folded over edges removed at a zone adjacent but spaced from said end whereby to provide a cross channel to receive therein a portion of a transversely disposed spline, and whereby to form relatively narrow opposed lugs at the end of said unit adjacent said cross channel, said lugs having their confronting inner edges spaced apart.

20. A construction unit for supporting kerfed structural elements in contiguous splined relationship, comprising an elongated spline having longitudinally extending opposed confronting edges spaced apart centrally of the spline to provide a longitudinally extending channel and longitudinally spaced apart contiguous free edges overhangingly spaced from the main body of the spline, said spline at one end having a cross channel extending completely from one longitudinal side of the spline to the other, and having at the extreme end of the spline adjacent said cross channel, relatively narrow inwardly extending lugs, the inner ends of which are spaced from each other and from the main body of the spline.

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