May 14, 1963 G. W. SHULTS 3,089,569

BUILDING CONSTRUCTION

Filed Jan. 19, 1959

Fig. 1.

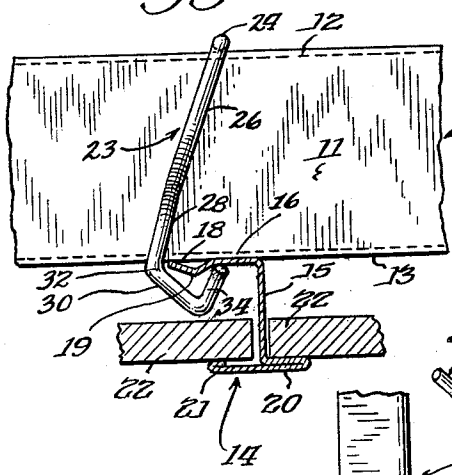


Fig. 5.

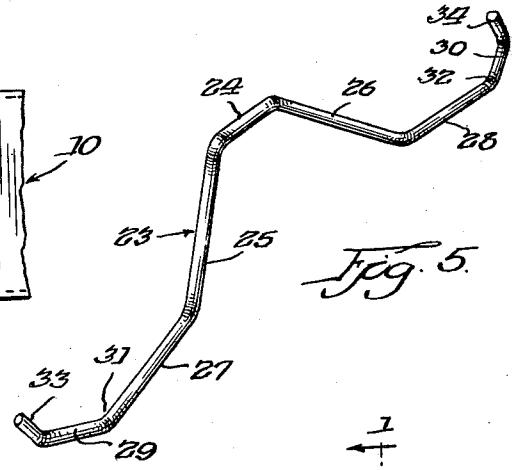


Fig. 2

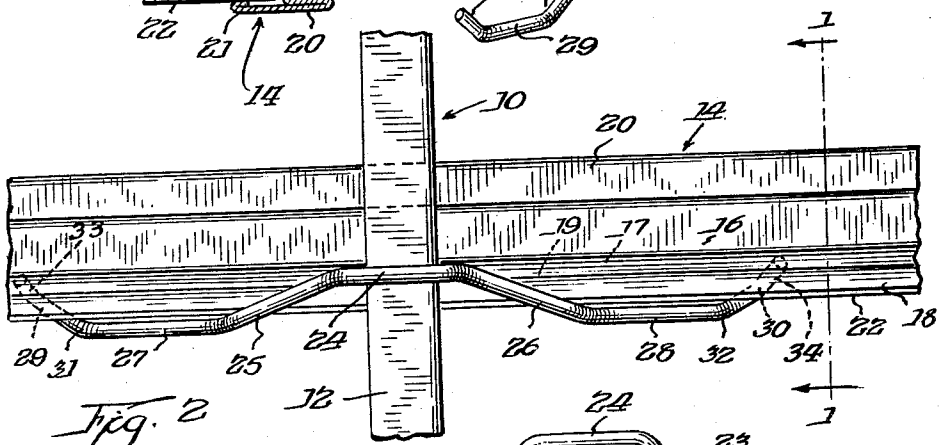


Fig. 3.

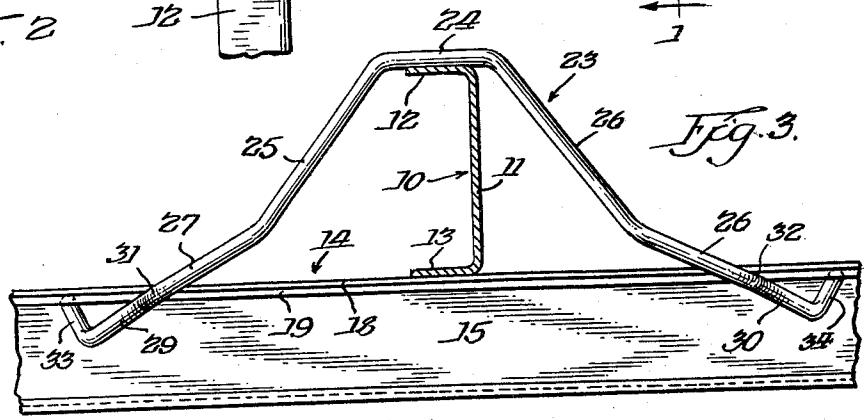
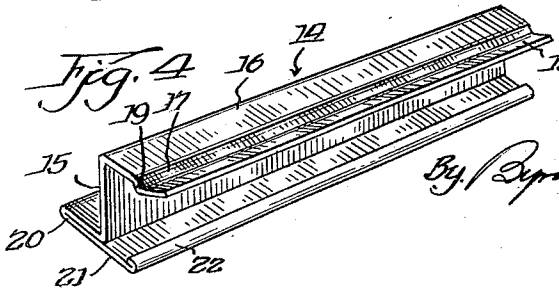


Fig. 4



Inventor.
George W. Shults.
By Dyer, Thieme, Brown & Clement
Attys.

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3,089,569

BUILDING CONSTRUCTION

George W. Shults, Flossmoor, Ill., assignor to Brasco Manufacturing Company, Harvey, Ill., a corporation of Delaware

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5 Claims. (Cl. 189—33)

My invention relates to a building construction, having particular reference to suspended ceiling construction, for use primarily in the provision of an acoustic or insulated ceiling, in which acoustical or insulation material in the form of square or rectangular pieces are used of approximately one inch in thickness, and are suspended from the joist or frame structure for the purpose of providing sound or temperature control in the room or space in which the ceiling is located.

Another object of my invention is the provision of a ceiling which can be provided in buildings already erected, as well as new structures, and which can easily and quickly be placed in position with a minimum of time and effort on the part of the workman making such installation.

Another and further object of my invention is the provision of a ceiling in which a plurality of primary support members, suspended from the joists or frame of a building usually by means of wire loops, which extend in one direction of the room while runners extend transversely to the support members are provided, which runners are secured to the support members by means of clips which extend over the support members and outwardly therefrom and engage the runners in such manner that the runners are resiliently held against the support members so that vibration, shocks, and movements of the building can be accommodated by the elasticity of the clip as well as the runners, and which can be easily and quickly placed in support position under the runners.

Another and further object of my invention is the provision of an improved clip for holding the support members and runners in operative relationship with each other, which can be easily and quickly applied by the workmen in the installation of acoustical and insulated ceilings, and in which elongated resilient leg portions can be easily and quickly placed into position without relative movement of either the support member or the runner, and in which the support points of the runner are spaced from the support member so as to provide more even distribution of the load carried by the runners and also a more firm, but elastic, mounting of the runner against the underside of the support member thereby providing an elastic holding means which is not easily moved and which holds the insulation blocks in proper position in the ceiling.

I am aware that various types of clips have been provided for this purpose, but generally such clips require a relative sliding movement of either the clips or the support member or both in order that they can be placed into position, whereas, in my improved construction, the action is a pivotal one so that the clip can be easily placed in assembled position with the support members and the runners without displacing the runners in their selected positions against the support member.

Another and further object of my invention is the provision of a ceiling construction in which the component parts are easily assembled with a minimum of effort on the part of the workmen making such installation more easily and quickly accomplished because of such flexibility of parts instead of the components being made of rather strict dimensional limitations and therefore difficult of installation which has been the practice in the past.

These and other objects of my invention will be seen

fully and better understood by reference to the accompanying sheet of drawings and in which:

FIG. 1 is a view partially in elevation and partially in section of my improved construction taken on line 1—1 of FIG. 2;

FIG. 2 is a plan view of the sections shown in FIG. 1;

FIG. 3 is a view partially in elevation and partially in section of the arrangement of parts shown in FIG. 2;

FIG. 4 is a perspective view of a portion of the runner used in my improved ceiling construction;

FIG. 5 is a perspective view of the clip used in my improved ceiling construction.

Referring now specifically to the drawings, and in which like reference characters refer to like parts throughout, a channel support member 10 is shown having a web 11 and flanges 12 and 13 thereon which extend away from the web 11 at right angles preferably in the same direction to the web 11 which support members are secured to the ceiling structure in any approved manner, such as by wire loops secured to the joists, or the frame members of the building, or the like, used to support a mastic floor in a building. A runner designated as a whole as 14 is provided, the runner 14 having a web section 15, a flange section 16, which is adapted to be fitted against the flange 13 on the support member 11, and which is bent downward at 17 throughout its length with an upwardly extending free edge portion 18, thereby forming an elongated rib 19 on the flange 16 intermediate the free edge portion 18 of the flange 16 and the web 15 of the runner 14, which rib 19 extends outwardly from the surface of the flange 16 opposite to that which is in engagement with the flange 13 on the support 11 for purposes hereinafter described. The web 15 of the member 14 has double flanges 20 and 21 thereon extending in opposite directions from the web portion 15, the flange 20 being formed by doubling the metal forming the member 14 back upon itself and across to the same side of the web 15 as is occupied by the flange 16 with the outer edge 22 being turned over to form a rib portion along the edge of the flange 21 which flanges 20 and 21 support the blocks 22, 22 by having the blocks placed thereon and in engagement with the lower surface of the blocks 22, 22 with the rib 21 being formed in such manner that the two ribs 20 and 21 are of the same thickness so the insulating blocks are placed in position in the ceiling in equal heights thereby presenting a smooth surface to the outer side of the blocks 22, 22. As shown, the flanges 20 and 21 are placed under the insulation or acoustical blocks 20, 22, 22 although these blocks may have kerfs cut in the side edges thereof, and the flanges 21 and 22 fitted into these kerfs if desired as is common in some forms of ceiling construction.

A plurality of clips 23 are provided, which have crown portions 24, which normally engage the flange 12 of the support member 11, and have leg portions 25 and 26 extending outwardly and downwardly therefrom at a divergent angle from the vertical plane of the support member 10, which leg portions 25 and 26 have extensions 27 and 28 thereon which extend outward from the leg portions 25 and 26 and downwardly therefrom, at a lesser angle than are the portions 25 and 26, and terminate in end portions 29 and 30 with connecting curved elbow portions 31 and 32 being provided whereby the end portions 29 and 30 are inwardly turned and also extend downwardly so as to pass under the flange 18 and the rib 19 and terminate in angularly disposed upturned tips 33 and 34, the ends of which engage the underside of the flange 16 between the rib 19 and web 15 of the runner 14, with the edge of the free portion 18 fitted into the curved or elbow portions 31 and 32 which connect the leg portions 27 and 28 with the portions 29 and 30 thereby providing

a close interfitted connection for the runner **14** against the support member **19** with the clips **23** being made of highly tempered wire in which the area of elasticity is fairly evenly distributed and quite stiff, but yet possess sufficient elasticity so the clip can easily be manipulated into position to hold the runner, the support member and load carried by the support member firmly in position in the ceiling construction.

In the assembling and erecting of a ceiling of the type shown in the drawings, the support members **10** are first placed in position and suspended from some portion of the permanent structure, such as the joists, or the like, usually by wire loops and the clips **23** are placed thereover with their leg portions extending to each side of the support member **10**, and then the runners **14** are placed in position with their upper flanges **16** fitted against the flange **13** on the lower side of the support member **10**, and the leg portion, such as **25** and **27** of the clip **23**, positioned at one side of the crown **24** would include the end **29** of the tip, such as **33**, is placed in position against the underside of the flange **16** with the tip **33** in engagement with the surface of the flange **16** between the rib **19** and the web **15** of the runner, with the runner **14** being thereupon adjusted to proper position, and the workmen by pressing down on the extension **28** of the leg **26** on the opposite side of the support member **10** move the end downward because of its elasticity in which position the tip is placed into position against the underside of the flange **16** and in which position, upon the pressure upon the extension being removed, the end **30** snaps into position thereby holding the runner **14** in position against the underside of the support member **10**. This operation can be performed by a workman with one hand while his other hand is free to support himself if on a ladder, and there is no necessity of spreading the leg of the clip or holding any of the other parts of the assembly while the clip is being placed in position.

The leg portions **25** and **26** extend outwardly and downwardly from the crown portion **24** of the clip **23** at an angle of approximately ten degrees to a perpendicular plane through the support member or to a point slightly beyond the edge of the portion **18** of the flange **16** the crown portion **24** being of sufficient length to allow some movement of the clip **23** thereon so as to provide an adjustment if the flange **12** may vary somewhat in width. In the normal position of the clip **23**, the extensions **26** and **27** of the leg portions **25** and **26** are substantially in alignment with each other just outside of the outer edge of the portion **18** of the flange **16** and the end portions **29** and **30** are curved inward at **31** and **32** in elbow fashion, and the tips **23** and **24** are turned to substantially vertical position so that the ends of the tips **33** and **34** of the end portions **29** and **30** engage the under side of the flange **16** and carry the load of the runner. When in position the marginal edge of the flange **18** fits into the elbow portions **31** and **32** of the clip between the leg extensions **27** and **28** and their end portions **29** and **30** of the extensions thereby forming a firm joint at this position, and also, bringing their end portions **29** and **30** into a position substantially perpendicular to the crown **24** of the clip **23**. The load is thereby supported on the center of the flange portion of the runner **14**, and when the clips **23** are turned into position there is a slight rotative movement of the leg portions which enables the workmen to snap the clip **23** into position under the runner **14** very easily and very quickly without movement of any of the other parts.

It will be thus understood that the clip of my present application differs from prior constructions in that the crown portion **24** is slightly longer to accommodate the clip to a wider support member and to a support member of slightly varying dimensions both as to width and height, and that the leg portions extend outwardly and downwardly therefrom instead of vertically alongside the support member so the clip may be easily flexed and

quickly and easily applied in position by an operator, and is also cheap to manufacture as the clip can be formed with a minimum of machine operations, and there is a minimum of right angled turns in the clip, and that the areas of flexure in the legs of the clip are distributed throughout their entire length instead of being located in the area of right angled turns as is the case with most of the prior art structures which areas are comparatively inflexible with the result that such clips are difficult to apply.

It will also be understood that the leg portions of the clip of my present invention are longer with only one point of contact with the runner so the workmen do not have to thread a hook over one edge of the runner but need only to flex the leg of the clip sufficiently to move the end under the web of the runner which enables the workman to place the clip of my present application into position very quickly with only one hand while supporting himself with the other hand if necessary. Likewise the supporting structure is easy to remove should an installation be torn out because the flexibility of the clips is much greater than the close fitting substantially inflexible clips now in common use.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts and the substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit or scope of the invention.

What is claimed is:

1. Ceiling construction comprising in combination a support member, a runner having a web portion and flanges integrally formed therewith along each of its edges, one of said flanges being in normal engagement with the support member and having a rib formed longitudinally thereof intermediate the web portion and the outer free edge of the said flange, the other of said flanges extending in two directions away from the said web edge and forming ceiling tile support means, and an integrally formed resilient clip having a central crown portion in engagement with the support member, leg portions extending outwardly and downwardly from said crown portion, each of said leg portions having extensions thereon extending outward and also downward at a lesser angle than does the leg portions, the extensions having inwardly turned end portions extending under the flange on the said runner in engagement with the support with upwardly turned tips thereon abuttingly engaging the said flange on each side of the support member on its side opposite to the side of the flange in engagement with the support member whereby the said runner is supported.

2. Ceiling construction comprising in combination a support member, a runner having a web portion and flanges integrally formed therewith along each of its edges, one of said flanges being in normal engagement with the support member and having a rib formed longitudinally thereof intermediate the web portion and the outer free edge of the said flange, the other of said flanges extending in two directions away from the said web edge and forming ceiling tile support means, and an integrally formed resilient clip having a central crown portion in engagement with the support member, leg portions extending outwardly and downwardly from said crown portion a substantial distance from the said crown portion, each of said leg portions having extensions thereon extending outward and also downward at a lesser angle than does the leg portions, the extensions having inwardly turned end portions extending under the flange on the said runner in engagement with the support with upwardly turned tips thereon abuttingly engaging the said flange on each side of the support member on its side opposite to its side in engagement with the support member whereby the said runner is supported.

3. Ceiling construction comprising in combination a

support member, a runner having a web portion and flanges integrally formed therewith along each of its edges, one of said flanges being in normal engagement with the support member and having a rib formed longitudinally thereof intermediate the web portion and the outer free edge of the said flange, the other of said flanges extending in two directions away from the said web edge and forming ceiling tile support means, and an integrally formed resilient clip having a central crown portion in engagement with the support member, leg portions extending outwardly and downwardly from said crown portion, each of said leg portions having extensions thereon extending outward and also downward at a lesser angle than does the leg portions, the extensions having angularly disposed inwardly turned end portions extending under the flange on the said runner in engagement with the support with upwardly turned tips thereon abuttingly engaging the said flange on each side of the support member on its side opposite to its side in engagement with the support member whereby the said runner is supported.

4. Ceiling construction comprising in combination a support member, a runner having a web portion and flanges integrally formed therewith along each of its edges, one of said flanges being in normal engagement with the support member and having a rib formed longitudinally thereof intermediate the web portion and the outer free edge of the said flange, the other of said flanges extending in two directions away from the said web edge and forming ceiling tile support means, and an integrally formed resilient clip having a central crown portion in engagement with the support member, leg portions extending outwardly and downwardly from said crown portion, each of said leg portions having extensions thereon extending outward and also downward at a lesser angle than does the leg portions, the extensions on the leg portions of the clip extending below the flange of the runner in engagement with the support and having inwardly turned end portions extending under the flange on the said runner, and having upwardly

turned tips thereon abuttingly engaging the said flange on each side of the support member on its side opposite to the side in engagement with the support member whereby the said runner is supported, the said clip being in biased engagement with the flange on the runner in engagement with the support member.

5. A ceiling construction comprising in combination a support member, a runner having a web portion and flanges integrally formed therewith along each of its edges, one of said flanges being in normal engagement with the support member and having a rib formed longitudinally thereof intermediate the web portion and the outer free edge of the said flange, the other of said flanges extending in two directions away from the said web edge and forming ceiling tile support means, and an integrally formed resilient clip having a central crown portion in engagement with the support member, leg portions extending outwardly and downwardly from said crown portions in a plane angularly disposed to a perpendicular plane through the support member, each of said leg portions having extensions thereon extending outward and also downward at a lesser angle than does the leg portions, the extensions on the leg portions of the clip extending below the flange of the runner in engagement with the support and having inwardly turned end portions extending under the flange on the said runner in engagement with the support, and having upwardly turned tips thereon abuttingly engaging the said flange on each side of the support member on its side opposite to the side in engagement with the support member whereby the said runner is supported, the said clip being in biased engagement with the flange on the runner in engagement with the support member.

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