

Dec. 28, 1965

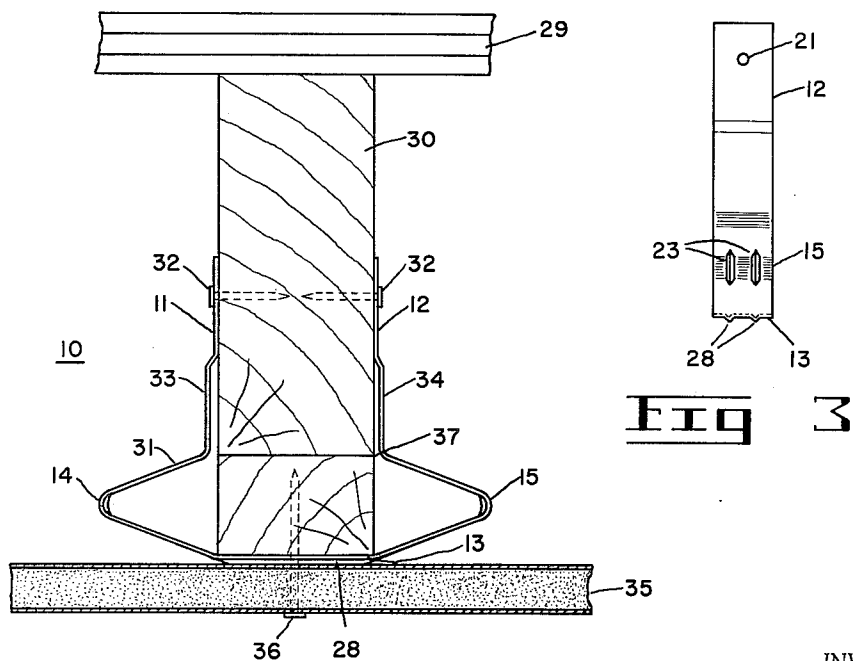
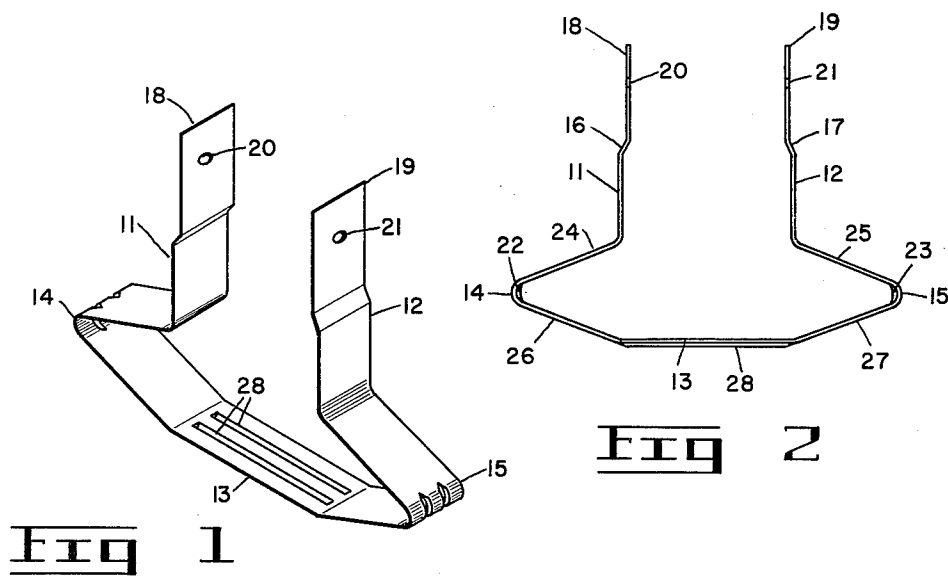
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3,225,394

CEILING SUSPENSION CLIP

Filed May 8, 1963

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

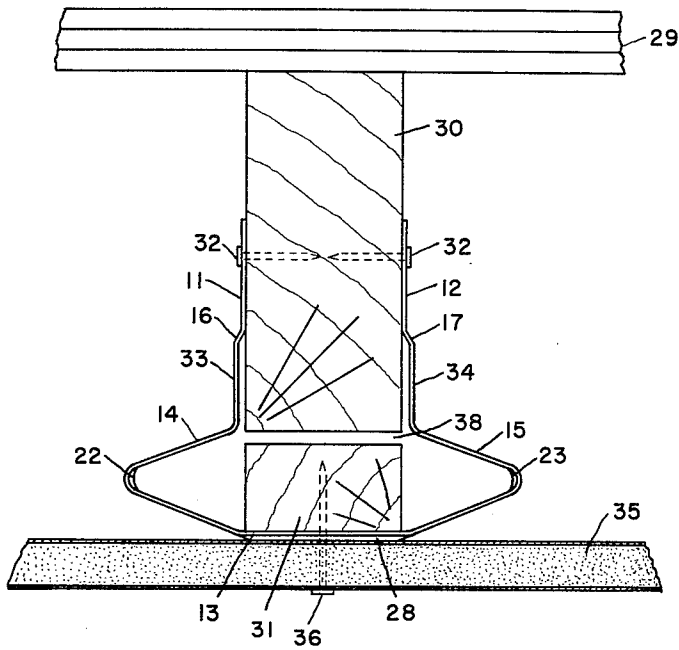


Fig 5

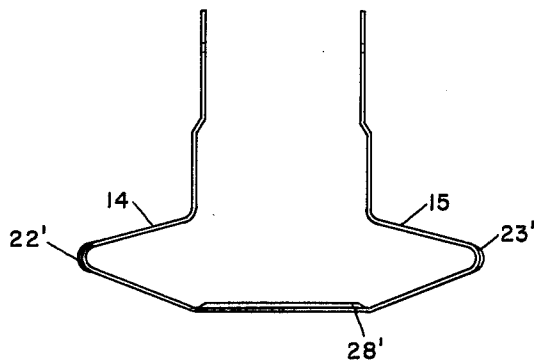


Fig 6

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CEILING SUSPENSION CLIP

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This invention relates to building construction; and especially it relates to a suspension clip or hanger device for installation of a ceiling in a building.

In building construction, one of the problems has been sound control, or the assurance of acoustical properties in room construction or in building construction, particularly in a multi-unit building comprising several floors superimposed on each other. In the past, ceiling boards have been applied directly to the ceiling joist or various types of clips have been used to suspend or to affix ceilings.

According to the present invention, a device is provided which enables suspension of a ceiling in a manner to reduce or prevent or minimize the transmission of sound upwardly or downwardly in multi-unit building construction. In this invention a ceiling clip or hanger device is provided which reduces the sound transmission by resiliently supporting a furring strip, to which the ceiling board or tile is nailed or otherwise affixed, and it also avoids or minimizes friction between the metal of the clip and the supported furring strip in order to reduce noises arising from the rubbing of metal on wood or any other material of which the furring strip is made. The ceiling clip is also provided with means incorporated in the end members thereof to prevent bowing of the end element and avoid pushing away the suspended tile or board, with consequent avoidance of nail head popping in such board or tile.

Some embodiments of the device of the present invention are shown in the drawings wherein FIG. 1 is a perspective view of a resilient ceiling clip. FIG. 2 is a side elevational view of a ceiling clip. FIG. 3 is a side elevational view of the device of FIG. 2. FIG. 4 shows a typical installation in a ceiling of the clip according to the present invention. FIG. 5 shows an installation according to the present invention after a ceiling panel is installed. FIG. 6 shows another embodiment of the clip of this invention.

In the drawings, 10 is the clip generally. It comprises two opposed upper leg members indicated generally at 11 and 12, a bottom member 13 in which a furring strip will rest upon installation, and intermediate rebent portions 14 and 15, interposed between bottom member 13 and upper leg members 11 and 12, respectively.

Upper leg members are each provided with a shoulder offset, indicated at 16 and 17, 16 extending inwardly toward the central vertical axis of the clip and uppermost flat ends 18 and 19 of leg members 11 and 12, respectively, extend upwardly from the internal terminus of each shoulder 16 and 17, respectively. At the upper end of each of the upper arms inwardly displaced leg members 18 and 19 suitable bear apertures 20 and 21, respectively, to enable nailing or screwing to the joist upon installation.

Bottom member 13 is a flat piece of metal and is joined to upper leg members 11 and 12 by rebent portions 14 and 15, which extend from the respective termini of flat member 13 to the lower terminus of 11 and that of 12, respectively. Reinforcing ribs 22 and 23 are disposed in the outermost curved surfaces of rebent portions 14 and 15, respectively, which include upper flat arms 24, 25 and lower flat arms 26 and 27, respectively, each pair of upper and lower flat arms converging toward the

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curved outer portion which connects the pair. Bottom member 13 is also provided with reinforcing ribs, indicated at 28. Preferably all of the reinforcing ribs, 22, 23, 28, are disposed parallel to the longitudinal axis of each member provided therewith.

FIG. 4 shows the ceiling clip of this invention as installed in a ceiling, wherein 29 represents generally the floor from which the ceiling joist 30 is suspended and to which it is attached. The ceiling joist, as shown in this example, is of wood but any other desired suspending means can likewise be employed. The furring strip is disposed directly beneath the joist 30 and is also of wood, as shown in this figure, but any other desired furring strip material can alternatively be employed. Ceiling clip 10 is set in place and nailed to joist 30 by nails 32 which extend through apertures 20 and 21, respectively. In this installation, the upper portions 18 and 19 of leg members 11 and 12 rest against the respective side surfaces of the joist, while the lower portions 33 and 34 are displaced outwardly and out of contact therewith, and especially out of contact with the furring strip 31.

In the embodiment shown in FIGS. 1 to 4, the lower portions 33 and 34 of side legs 11 and 12 are displaced outwardly by means of outwardly extending shoulders 16 and 17, respectively. As can be seen in FIG. 4, when a panel, tile or board 35 is to be installed as part of the ceiling, it is nailed to furring strip 31, or otherwise affixed thereto, for example, as shown at 36. During such installation, the furring strip rests against the lower surface 37 of joist 30; and after the ceiling panel or tile has been nailed into place and pressure is released, the resilient rebent portions 14 and 15 will expand or open and permit the ceiling and furring strip to drop away slightly from joist 30, providing a spaced area, as shown at 38 in FIG. 5. At the same time, reinforcing ribs 28 in bottom member 13 maintain this member in flat position to provide a good support for furring strip 31. It is to be noted in the preferred embodiment that these reinforcing grooves or ribs are convex downwardly. At the same time, reinforcing ribs 22 and 23, which are convex inwardly in the preferred embodiment, and which extend over the outer curvature of rebent portions 14 and 15, respectively, reinforce these rebent portions so that the sag is not excessive.

It is noted that lower portions 33 and 34 of arms 11 and 12, respectively, are displaced outwardly out of contact with joist 30. It has been found that in such a construction, when the ceiling exhibits any springing or resilient action, there is no noise set up by rubbing of arms 11 and 12 against the surface of furring strip 31. Shoulders 16 and 17 are preferably located about half way of the total length of the arms 11 and 12 so that at least half, or alternatively from $\frac{1}{4}$ to $\frac{3}{4}$, of arms 11 and 12 is displaced outwardly from the surfaces of joist 30.

Alternatively to the above construction, it is to be understood that reinforcing grooves 28 in flat bottom member 13 can be convex upwardly, or one or more can be convex upwardly and one or more convex downwardly. Also, in an alternative construction, reinforcing ribs 22 and 23 can be convex outwardly or one or more can be convex outwardly and one or more convex inwardly, but the preferred construction is as shown above. It is preferred that the ribs in the bottom member extend over substantially the whole length thereof, and that one or more ribs be provided. It is preferred that the ribs in the rebent element extend over the curvature or curved ends only, and that one or more such ribs be provided, preferably two ribs. The ribs in each instance are shallow, e.g., preferably of not over about $\frac{1}{16}$ inch depth in a nominally 2" x $\frac{5}{8}$ " bottom member.

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In one embodiment of the clip of this invention which exhibits excellent resiliency and uniform letdown under load, with no squeaks or rattling noises under load, the device was made of Type 301 stainless steel, 0.0165 inch in thickness. It is an advantage of the device of this invention that, after initial letdown of an installed ceiling, the ceiling remains substantially stable with no further deflection of the clip. Also, after exposure under load to a temperature of 140° F. for 51 hours, the clip, according to this invention, showed little or no additional movement or deflection due to the heat.

In still another embodiment of the present invention, it will be understood that the clip can be made larger than to fit over a single joist and, for example, it can be made of such size as to embrace a double joist. Alternatively, also, the furring strip can be of deeper cross section, whereby its upper surface extends into the space between legs 33 and 34 when under load, while still retaining the advantages of this invention. In any embodiment of this invention, due to the outwardly displaced lower ends of the side arms 11 and 12 and the configuration and placement of the rebent portion, the furring strips float free on the clip with elimination of squeaks, as indicated above. It has been found that the stiffener or reinforcing ribs or grooves in the flat bottom member eliminate downward bowing or arching of the member when installed and bearing a furring strip. Such bowing or arching is undesirable because it causes nail-popping after a ceiling tile or panel has been installed.

The provision of the rebent element between the lower terminus of the flat side arm and the terminus of the flat bottom member has proved especially advantageous in that the rebent portion is not deflected when installed at intersecting partitions but remains in place and effective to hold a furring strip in desired alignment. In an alternative construction, the ceiling clip of this invention comprises two flat side arms and a flat end member, and a rebent element disposed between and connected to the lower terminus of each side arm and a terminus of the flat end member, and one or more, preferably two, reinforcing ribs or grooves, in the curvature of the rebent element. There is also provided one or more, preferably two, reinforcing ribs or grooves in the flat end member, as described above.

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Having now described the invention, what is claimed is:

1. A ceiling suspension clip adapted to support a furring strip upon installation in a building structure and to maintain said strip in resilient, spaced relationship with a ceiling joist in said structure, said clip comprising (a) a horizontal bottom member, said member having reinforcing ribs extending substantially the whole length of said member, (b) rebent portions attached to each end of said bottom member and extending upwardly from said bottom member; and (c) an upper side arm attached to the upper end of each rebent portion to form a pair of side arms, each arm extending upwardly in a direction generally perpendicular to the bottom member, said pair of side arms comprising upper portions spaced apart a distance substantially equal to the distance between the side surfaces of the joist and adapted to abut said side surfaces upon installation, lower portions spaced apart a distance greater than the width of said joist and said furring strip, and (d) a downwardly and outwardly extending shoulder joining said upper and lower portions of each said side arm.

2. A ceiling suspension clip according to claim 1 wherein said reinforcing ribs are convex downwardly.

3. A ceiling suspension clip according to claim 1 wherein at least two reinforcing ribs are disposed at the outermost portion of each of said rebent portions.

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