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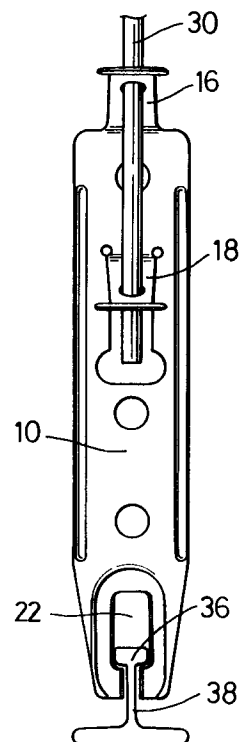
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LEWIS W. GOOLD & CO.
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Birmingham B3 2BL (GB)(54) **Suspended ceilings.**

(57) A hanger for a suspended ceiling system comprising an integral suspension clip made by striking up a limb 18 out of the material of the actual strip 10, and forming a second limb 16 as a tail at the end of the strip. The opposite end of the strip is formed to engage the rail 36, 38 by having a slot 22 communicating with the bottom end of the strip via a narrowed slot portion so that the beady rail can be accommodated as shown in Figure 2.

**Fig. 2****EP 0 607 707 A2**

A common system for suspended ceilings employs a plurality of panels to make up the ceiling, supported at their marginal edges on the lateral flanges of for example inverted Tee section rails. The rails are assembled into a grid which is substantially coplanar, and particularly if the roof or hidden ceiling is non-planar or non-level it is necessary to use adjustable ties between that roof or ceiling and the grid in order to obtain the required level of the grid. For this purpose, the rails are engaged with hangers which are in turn adjustably engaged with rods fixed to the roof or the like. The fixing is usually by means of a U-shaped spring clip with divergent limbs which are co-axially apertured. The rod is threaded through those apertures after they have been deflected against their resilience into a parallel position, and when the deflection force is released the limbs return to the divergent position and lock upon the rod.

The actual hangers have comprised sheet metal pressings with a slot of the required shape in the lower end for engagement with the individual rail. The spring clip has been riveted to the plate.

Many different sections are used for the rails and a different slot shape is required to cooperate with each of these, so these hangers are made in very different types. Moreover, alternative fixing methods dispense with the clips, which calls for yet more different hangers.

The object of the invention is to simplify the hangers and preferably also enable a smaller number of different designs to meet more of the differing requirements.

According to the invention from a first aspect a hanger for the purpose described is made integrally and unitarily with a fixing clip by manufacturing the whole hanger from spring steel and forming the two apertured limbs out of the strip. This can be done by a pressing operation, and two pairs of punched holes and two rivets are saved apart from avoiding any possibility of clips becoming detached through rivet failure. Preferably one limb is formed from an end of a hanger as a tail bent at an angle to the hanger, and the other limb is struck up out of the material of the hanger and is bent about a line extending between a pair of circular punchings, for the purpose of reducing the possibility of fatigue cracks extending from the line of the bend.

Preferably also the hanger is rigidified by one or more swaged ribs extending generally parallel to the lateral edges of the strip at least over the area between the limbs and preferably over a substantially greater length of the strip.

According to a second aspect of the invention the number of required hangers of different kinds is to be reduced firstly by making each hanger suitable for use with more than one different rail sec-

tion.

Thus for example, in the case of the inverted Tee section rails having a bead formed at the free end of the stem of the Tee, the hanger will comprise a narrow slot extending through the lower (in use) end edge of the hanger and opening into a wider slot portion. The stem of the Tee will extend through that narrower slot and the bead will be located in the wider slot: in order to accommodate different beads, the wider slot may be stepped so that immediately adjacent the narrow slot portion it is of an appropriate width and edge shape in order to receive the narrower or smaller of a number of different beads, immediately adjacent to that area is of a greater width and different curvature to suit a second kind of bead, and so on. By these means the required number of hangers may be halved or even further reduced.

Preferably the slot formed in the hanger has formed edges, that is to say the hanger may be made from sheet metal, and instead of simply forming the slot by removing material over the area of the slot, that material may be formed so that it extends for example at right angles to the plane of the sheet around the periphery of the slot. This reinforces the material and enables greater weights to be suspended and possibly enables thinner sheet metal to be used.

The number of different hangers may be further reduced by making provision to enable different suspension means to be used, as will become clear from consideration of the following description with reference to the accompanying drawings wherein

Figure 1 is a side elevation of part of the suspended ceiling assembly;

Figure 2 is a front view of the same; and

Figure 3 is a perspective view of the hanger used in Figures 1 and 2.

Referring first to Figure 3, the hanger is a metal pressing effectively comprising a strip of spring steel, with parallel swages to create integral stiffening ribs 12, 14 along lateral edges over much of its length. At one end a tail 16 projects at an obtuse angle (see Figure 1). A limb, which is a formation like the tail, 18 is struck up out of the strip and is oppositely inclined. Both limb and tail comprise a shank with an enlarged end which is for manual manipulation. Both the shanks are apertured at 20 and as seen in the drawings the enlarged ends extend more normally of the strip in the position of use for convenience as explained below.

The strip, as stated, is of resilient material enabling the parts 16, 18 to be squeezed together by pressure between a finger and thumb so as to make the apertured shanks parallel and the apertures co-axial. Release of pressure restores the

parts to the shown position.

The opposite end of the strip has in this specific case an elongated wide slot 22 communicating with a narrow slot 24 which opens to the end of the hanger. The area about the slots is also swaged to form an encircling stiffening rib 26.

In use, the tongues are squeezed together enabling a fixing rod 30 depending for example from a roof beam, to be threaded through the holes. When the clip is released the resilience restores the parts to the position shown which causes the clip to lock onto the rod, providing the rod is of a suitable diameter. It will be appreciated that the axial position is set before release, but it is easily adjusted thereafter by squeezing the parts together, sliding the hanger to the required position and then releasing the parts.

The ceiling panels are supported on rails 32, which may be formed into a grid, and which are retained in position on the hangers by means of the slots 22 and 24 by threading through those slots.

Different rail sections can be accommodated by the arrangements described hereinbefore, or more simply by making slot portion 22 large enough to accommodate the largest bead 36 of any of the range of rails to be accepted, whilst making the narrow portion of the slot of less width than the smallest of those beads but longer than the stem of any of the rails. Other dimensions of the slots are relevant as will be clear to the man skilled in the art.

To increase the versatility of the hanger of the drawings, holes 40 are provided which can enable screw fixing to battens instead of using the parts 16, 18.

Where the rail to be engaged is of a different design and the wide/narrow slot is inappropriate, then appropriate modifications will be made, or an intermediate component will be provided to engage in the illustrated slot at its upper end and engaged with the rail at its lower end.

Claims

1. A hanger for a suspended ceiling system made integrally and unitarily with a fixing clip by manufacturing the whole hanger from spring steel and forming two apertured limbs out of the strip.
2. A hanger as claimed in Claim 1 comprising a length of strip material provided with a tail at one end forming one of the limbs, and a second limb struck out of the material of the strip.
3. The hanger of Claim 2 wherein the tail and said struck up limb extend at like but opposite

obtuse angles to the strip.

4. The hanger of Claim 2 or Claim 3 wherein the tail and said struck up limb each comprise an apertured shank and enlarged head which is inclined to the length of the shank.
5. The hanger of any of Claims 1 to 4 which is rigidified by swaged ribs along its length.
6. The hanger of any preceding claim having a slot for rail engagement, comprising an enlarged slot opening to one end of the hanger via a narrowed portion.
7. The hanger of Claim 6 wherein the material about the slot is formed to stiffen the area of the vicinity of the slot.
8. The hanger as claimed in any preceding claim also provided with spaced fixing holes.
9. A hanger for a suspended ceiling substantially as described and illustrated in the accompanying drawings.

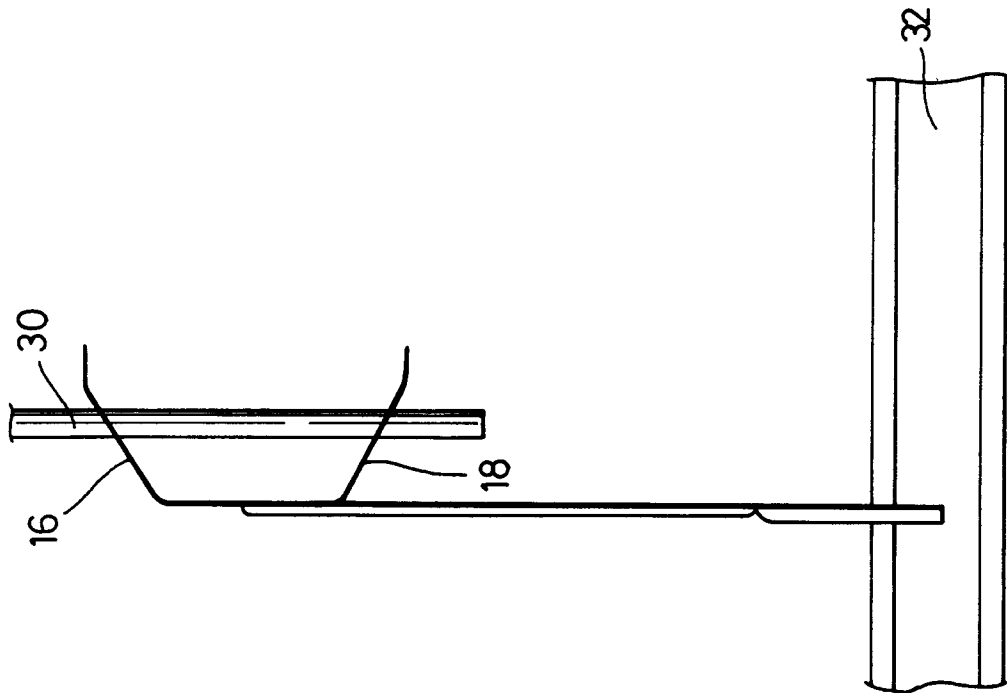


Fig. 1

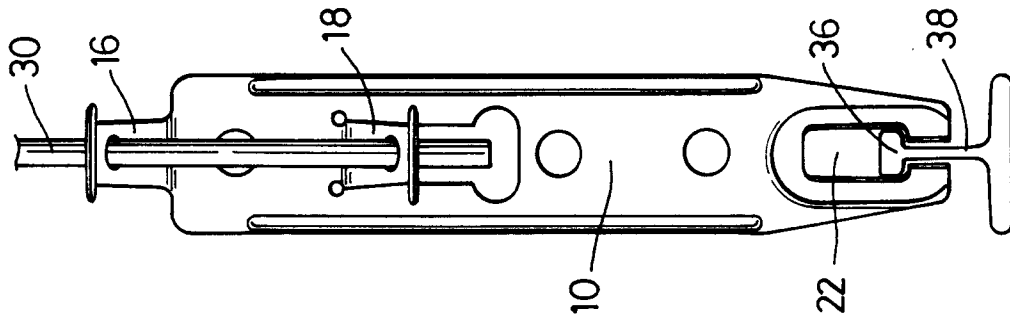


Fig. 2

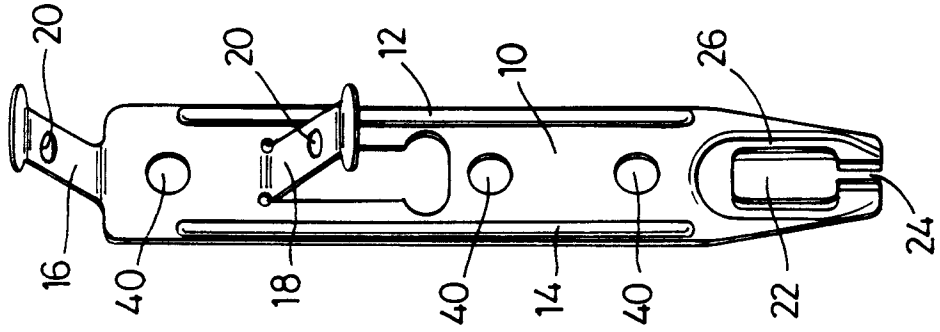


Fig. 3