

Feb. 17, 1970

F. FRUH

3,495,796

HANGER FOR SUSPENDED CEILINGS

Filed Oct. 30, 1967

2 Sheets-Sheet 1

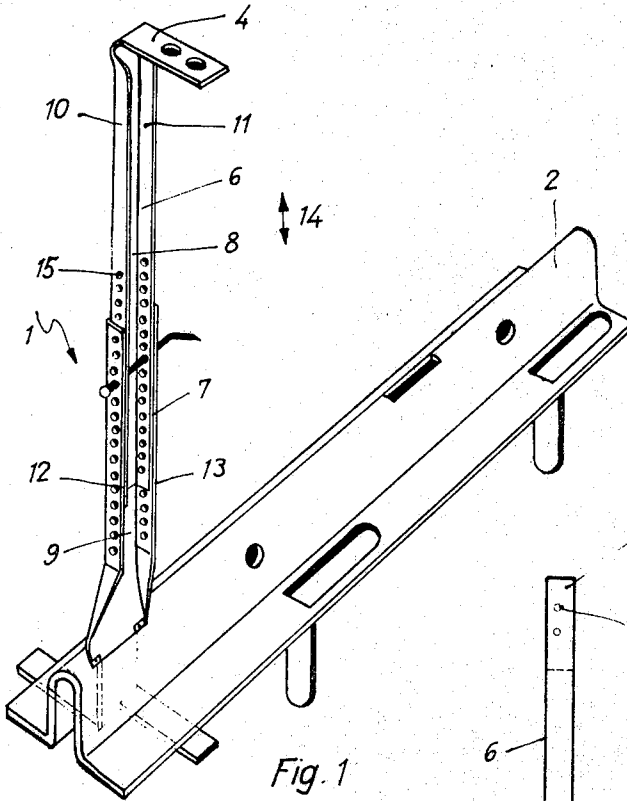


Fig. 1

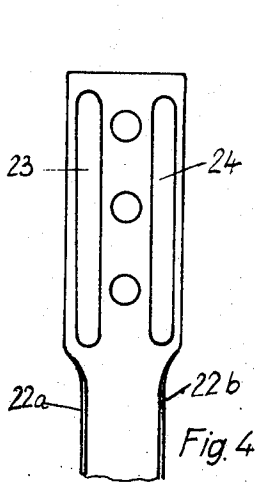


Fig. 4

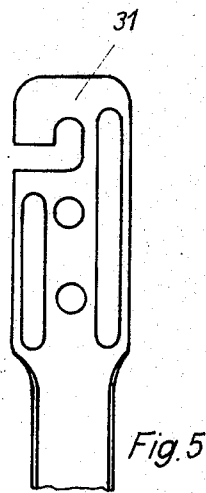


Fig. 5

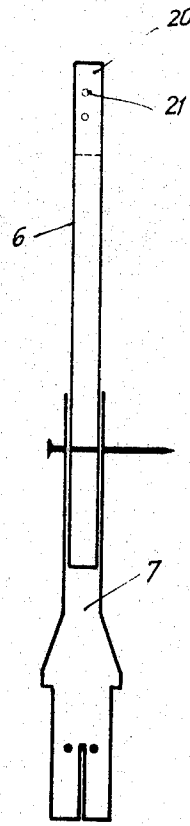


Fig. 2

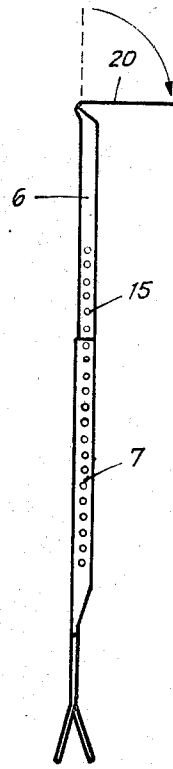


Fig. 3

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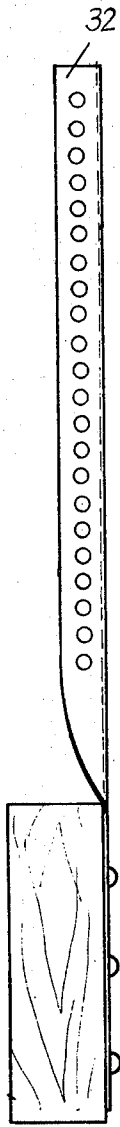


Fig. 6a

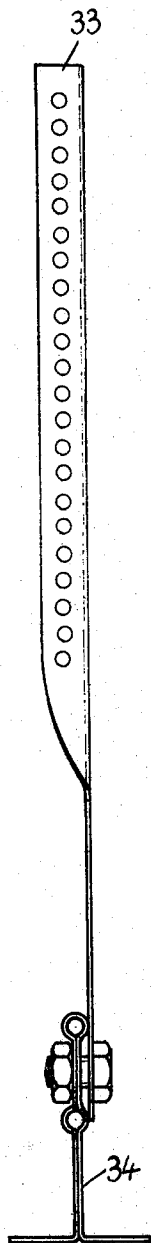


Fig. 6b

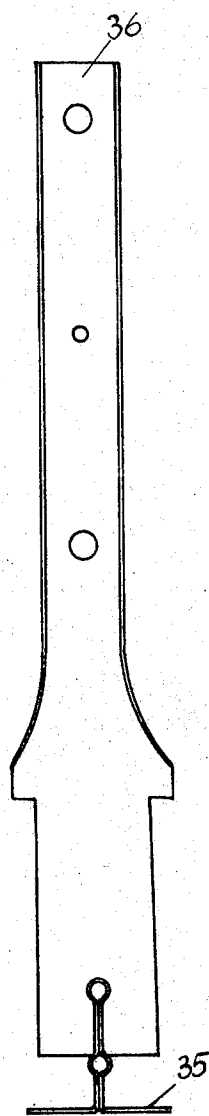


Fig. 6c

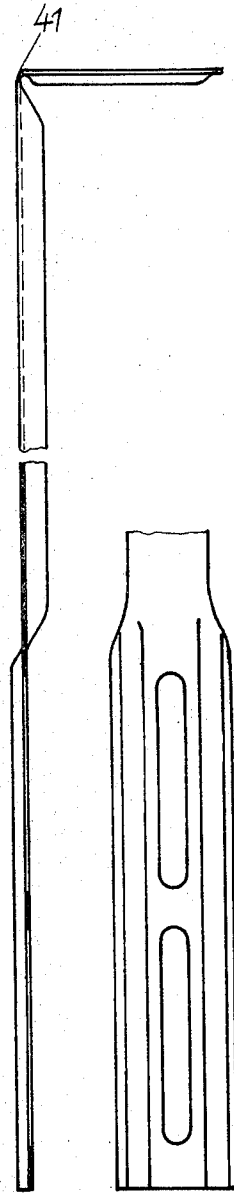


Fig. 7

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**HANGER FOR SUSPENDED CEILINGS**

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F 50,572

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3 Claims

**ABSTRACT OF THE DISCLOSURE**

An adjustable hanger for supporting rails for carrying a suspended ceiling is formed of U-shaped parts one fitting within the other, each part having a succession of equally spaced holes in the legs thereof, there being  $n$  holes in a given length of one of the parts and  $n-1$  holes in an equal length of the other part; pins which fit loosely in the holes are used for temporary adjustment and pins which fit tightly for final positioning.

**BACKGROUND OF THE INVENTION**

Field of the invention

The invention refers to an adjustable hanger for carrier and fastener rails to carry a suspended ceiling. More particularly the invention is concerned with a hanger of the kind in question consisting of two portions namely an upper one that is suitable for being attached to a raw ceiling, and a lower one that is adjustably connected with the upper one and that has in its turn a lower end suitable to be connected with the carrier and fastener rail.

**SUMMARY OF THE INVENTION**

According to the invention both portions of the hanger are provided with a row of holes at equal distances from one another and so profiled that the profile of the one portion may be partly surrounded by the profile of the other one, thus forming an axial parallel guide for it; whereby a nail going through holes of the said two portions in alignment with one another may establish a solid connection between these portions.

The primary object of the invention is to provide a hanger with which the total length of a row with  $n$  successive holes on the one portion of the said hanger is equal to the total length of a row with  $n-1$  successive holes on the other portion of the said hanger.

A further object of the invention is to provide a hanger in which the cross sections of the said two portions of the hanger are shaped like a U, in which case their legs bent off rectangularly from the corresponding web will lie side by side in pairs.

Another object of the invention is to provide an arrangement of the kind here in question which makes it possible to adjust the ceilings so exactly that small fractions of a millimeter can be taken into account, since now the adjusting distances can be determined by suitably choosing the numbers  $n$  and  $n-1$ .

Still another object of the invention is to provide a hanger of the kind here in question in which the two portions of the hanger have U-like cross section so as to guarantee the necessary stiffness and so that none of the portions can give way in any direction and, further, so that the portions can be of normal thickness.

Still a further object of the invention is to provide a hanger of the general character above described in which the nail or pin or bolt forming the connection between the said two portions of the hanger passes through the two legs of the U in such a manner that it is supported as well as loaded at two points and that on the one hand

a safe guidance of the said two portions and, on the other hand, a sufficient protection against the shearing off of the nail or pin is provided.

Yet another object of the invention is to provide a device of the above said type by means of which a ceiling can be made without the risk of damages due to a pressure exerted from below in the course of assembling operations.

Another object of the invention is to provide a hanger of the kind here in question in which the assembling operation is most simple and requires a minimum of time only.

Other objects and advantages will appear hereinafter and while I show herewith and will describe a preferred form of construction, I desire it to be understood that I do not limit myself to such preferred form but that various changes and adaptations may be made therein without departing from the spirit of my invention as herein-after claimed.

**BRIEF DESCRIPTION OF THE DRAWING**

Referring to the drawings which accompany this specification and form a part thereof:

FIG. 1 is a hanger according to the invention as used in connection with a suspended ceiling in which the carrier and fastener rails have to hold rails made of so-called expanded material.

FIG. 2 is the hanger according to the invention in a diagrammatic front view.

FIG. 3 is the hanger according to FIG. 2 in a diagrammatic side view.

FIG. 4 is a detail of the hanger according to the invention in a front view on a larger scale.

FIG. 5 is a detail of a modified embodiment of the invention also in a front view and on a larger scale,

FIGS. 6a, 6b, 6c show different embodiments of a hanger according to the invention each in a diagrammatic front view, and

FIG. 7 is a front view of another modified embodiment of the invention.

**DESCRIPTION OF THE PREFERRED EMBODIMENT**

The hanger 1 according to the invention serves for fastening up the carrier and fastener rail 2 made of wood or metal on which the plates, slabs or rails forming the ceiling or wall are attached. The hanger 1 is to be attached with its upper end 4 to the basic construction or raw ceiling. According to the invention the hanger consists of two portions 6, 7, which have a U-like cross section and are telescoped into one another so that their relative position can be changed, whenever required, and they can be fixed in their relative position. For that purpose the legs 10, 11 and 12, 13 bent off at right angle from the corresponding webs 8, 9 are laid side by side in pairs, whereby the two portions can be displaced with respect to one another as indicated by the arrow 14. The legs of these portions are provided with rows of holes 15 extending over a considerable part of their lengths, said holes 15 being spaced apart by equal distances, the total length of a row with  $n$  holes succeeding one another on the leg of the one portion corresponding to the total length of a row with  $n-1$  holes succeeding one another on the adjacent leg of the other portion; as for the embodiment shown in the drawings, the total length of a row of seven or eight holes succeeding one another on a leg of the outer portion is equal to the total length of a row with six or seven holes succeeding one another on the adjacent leg of the inner portion. This arrangement allows an adjustment of the length of the hanger and, therefore, indirectly of the height

of the wall or ceiling that is accurate to the millimeter. The holes on the two legs of the U of each portion are arranged co-axially to each other, and their diameters correspond, thereby, exactly to each other. It is now possible to fix the two parts in any required relative position by means of nails or tinned wire tacks passing through the holes. Of the said two portions, the upper one is attached to the basic construction, whereas the lower one is connected with the carrier and fastener rail. Both portions are made of metal. The portion to be attached to the basic construction may be replaced by other upper portions which are combinable with the same lower portion. On the other hand the lower portion to be connected with the carrier or fastener rail may be likewise replaced by other lower portions which are combinable with the same upper portion. The upper portion may belong to a set of portions which contains a series of upper portions the lengths of which increases gradually by differences, respectively, equal to the amount  $x$ . The lower portion may belong to a set of portions that contains a series of lower portions equal in their lengths, but so shaped and constructed as to be able to embrace differently constructed and shaped elements for ceilings and walls. Thus, with a small number of types of such elements it is possible to construct ceilings and walls that differ from one another on the one hand with regard to their height, and on the other hand with regard to their kind and type. To demonstrate in what different manners the device according to the invention can be used, there is shown in FIG. 5 the hook-like end of an upper portion 31 intended to be hung into concrete constructions so often used nowadays, whereas in FIG. 6a there is shown the fastening of a lower portion 32 to a wooden ledge, in FIG. 6b there is shown a hanger 33 laterally screwed onto a metallic rail 34, and in FIG. 6c a rail 35 is hooked into the hanger 36. The number of elements necessary for this multiple uses of the device according to the invention is small so that the manufacture as well as the stockage of these hangers is rather simplified.

The fastening end of the hanger consists of a plane sheet metal portion 20 provided with two, three, or eventually more holes for the fastening elements such as nails or screws. Hereby provision is made for making it possible to bend off by hand to an amount of about 90 degrees the area of the hanger where the fastening end and the hanger itself (which before use is contained in the same plane with its fastening end) are adjacent, as indicated in FIG. 3. The strips 22a, 22b of the fastening end of the hanger corresponding to the legs of the U, are in this case contained in the plane of the other parts of the fastening end, whereby this changing over from the fastening end to the hanger itself takes place by degrees and along a curve. The stiffness of the said fastening end is increased by so-called longitudinally extending stiffening ribs 23, 24 provided in the zone of its longitudinal edges, and bulging out of its plane in a head-like fashion. The device is assembled in the following way: first, the hanger is attached to the ceiling or basic construction, for example, by screwing, stapling or the like. With normal or usual basic constructions or raw ceilings, the fastening end is horizontally attached to the basic construction, whereby in this case the said fastening end and the hanger are still in one and the same plane. In this case, the web is no hindrance for the man who has to manipulate the hanger for hanging up the ceiling. Now, the hanger is rectangular bent off in downward direction so that it hangs down perpendicularly. With wooden constructions the bending down of the hanger is avoidable, if its fastening end is laterally nailed to the supporting beam, whereby the fastening end and the hanger itself remains one and the same plane. Subsequently, the lower portion of the hanger is hung in and roughly adjusted, whereupon the rest of the construction is attached to the hanger. Thus, the working operation

is considerably facilitated and shortened as to the time necessary for effectuating it. The two portions are hereby held together by a nail or tinned wire nail which is passed through the four holes opposite and coordinated to one another which are provided on the legs of the two U-like parts, said nail having a diameter inferior to the diameter of the holes. Because of the clearance or play between the nail or tinned wire nail and the hole associated thereto the construction can be exactly adjusted to the prescribed height. Hereafter the construction is blocked and fixed by uniting the two parts by means of another nail or tinned wire nail which is passed through the four opposite and associated holes of the webs or legs of the two U-like parts, in which case, however, the diameter of the nail or wire nail corresponds exactly to the diameter of the holes, so that the nail or wire nail can be tightly pushed or fitted or hammered into the said holes. The result is a rigid connection, so absolutely stable that the ceiling cannot give way during the operation of hanging up the different elements. The weaker nail remains in its holes to give an additional security to the whole arrangement; the thicker nail assures the stiffness of the construction. The projecting ends of the nails or tinned wire nails are bent down at a right angle. The result of this procedure is that it is possible to check reliably the whole arrangement at any time since it is now possible to find out at a glance the progress of the assembling operation in situ as well as what rails and hangers have already been adjusted. The arrangements hitherto known could not offer such a control; for it can not be seen without a time-consuming examination whether a screw is tight or not. In certain cases the hanger can be turned around or crossed to an extent of 90 degrees after its being attached at the basic construction, for instance, if the carrier or fastener rails are directed transverse to the longitudinal direction of the basic construction or transverse to the plane of the hanger. FIG. 7 shows a hanger 40, the upper end of which can be bent off to an extent of 90 degrees, as illustrated in the examples given above and as demonstrated at 41. In this case, however, the hanger consists of one piece only; its lower end is provided with longish holes suitable, for example, for hanging up tubular constructions and the like. In addition to the already mentioned advantages of the hanger, which incidentally is appropriate for all rolled shapes or profiles or sections that are offered in the usual market, this hanger has also the further advantage that a connection once established cannot be undone by vibrations, contrary to those connections hitherto known which are established by means of screws etc.

Having thus illustrated and described my invention, what I desire to secure by Letters Patent is:

1. An adjustable hanger for carrier and fastener rails to carry a suspended ceiling which comprises an upper portion that is to be attached to a basic construction so as to project therebelow, and a lower portion having secured to the lower end thereof a carrier and fastener rail, said lower portion being connected to said upper portion so as to be displaceable longitudinally with respect thereto, each of said lower and upper portions having a row of holes succeeding one another at equal distances, the profile of the one portion surrounding the profile of the other portion at least partially in order to constitute a co-axial parallel guide therefor, interconnecting means for the said two portions passing through holes of the said two portions which are in alignment with one another, the total length of a row with  $n$  successive holes on one portion of the hanger corresponds to the total length of a row with  $n-1$  successive holes on the other portion, wherein the said upper and lower portions have a U-like cross section, the legs of the U's of the said two portions being rectangularly bent off from the web in the same direction and lying in pairs

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one against the other, said legs constituting the cooperating means.

2. The hanger set forth in claim 1, wherein the interconnecting means comprises a pin-like member which passes through the four opposite and associated holes in the legs of the said two U-like hanger portions and which has a diameter smaller than that of at least one of the said holes in one of said hanger portions.

3. The hanger set forth in claim 1, wherein the interconnecting means comprises a pin-like member which passes through the four opposite and associated holes in the legs of the said upper and lower U-like hanger portions and which has a diameter corresponding exactly to the diameter of the said holes, so that it tightly fits into the holes.

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U.S. Cl. X.R.

248—59; 287—58