ELECTRICAL DEVICE HANGER

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ABSTRACT

An electrical device hanger is shown and described. The electrical device hanger can be used to suspend electrical devices at a user selected height and location so that conduit and electrical power can be run from another location to the device. This hanger is especially useful in open ceilings and reconstruction ceilings in commercial buildings. The hanger can be attached to the ceiling with a pair of threaded rods, a single threaded rod or s-hooks and jack chains. The hanger has clearance holes in the top and threaded holes in the bottom. The threaded rod passes through the clearance holes in the top and can be secured in the threaded holes in the bottom alone or can also be threaded to the device suspended. The device suspended from the hanger can also be affixed to the bottom of the hanger with fasteners in the threaded holes in the bottom. Alternatively, holes are provided in the top of the device hanger to utilize s-hooks and jack chain to attach the device hanger and the device to the ceiling. Conduit can then be affixed to attach the device to the power supply.
ELECTRICAL DEVICE HANGER

PRIORITY:

[0001] This application claims priority from Provisional Application for Patent Ser. No. 61/188,510 with a filing date of Aug. 11, 2008.

FIELD

[0002] The present version of these embodiments relate generally to the field of devices used to hang electrical boxes and devices from the ceiling especially in open ceilings and reconstruction ceilings of commercial buildings.

BACKGROUND

[0003] These embodiments relate to devices used to hang electrical boxes and other electrical devices from the ceilings of buildings, and more particularly to a device that is simple to install and relatively cheap to manufacture.

[0004] There are many large and small commercial buildings all over. Typically these buildings have a high interior ceiling and roof; then lights, outlets, exit signs and other electrical devices and conduit are hung either from the ceiling cross members or roof interior to a predetermined height and location. These hanging devices can be used for lighting and electrical power for the various devices that may be in use at the floor level such as equipment and machinery.

[0005] It generally would not be feasible to have the conduit and outlet boxes, lights and exit signs all run at the height of the ceiling or height of their use. This low height of the electrical power devices would require too much care when moving and installing equipment on the floor of the building and would just be difficult to move or rehabilitate a building with all of the electrical connections, lights, exit signs all located at the working height. Consequently, the conduit, boxes and electrical signs are attached to the main power at or nearer the ceiling to provide clearance for the movement of this heavy equipment on the floor and re-development or re-design of the space.

[0006] If the main power is running near the ceiling or roof interior, the power to individual outlets, equipment and exit signs and other devices must be run from the ceiling or roof interior to the individual locations where it is needed nearer the floor. This requires conduit and other electrical connections to connect the power from near the ceiling or roof interior to nearer the floor or user determined height and location. As a result, this equipment such as the outlets, exit signs, lighting and others must be suspended from the ceiling nearer the floor height.

[0007] One of the primary methods of getting power to the near the floor height or suspending electrical devices nearer the floor is to use threaded rod and framing channel or uni strut. This requires the installer to measure the distance from the interior of the roof or cross members to the elevation that is necessary for the location of the outlet, the exit sign or electrical device. Once the distance from power source near the roof is known, the installer must cut threaded rod. The rod is attached to the underside of the roof beams or other elevated interior roof structure. There are many devices in the art to accomplish the attachment of the threaded rod to the underside of the roof or other overhead structure.

[0008] The threaded rod is then be attached to framing channel or uni strut at the predetermined height and location nearer the floor. The device to be suspended from the framing channel must be attached to the framing channel and the threaded rod thus suspends the device a predetermined distance and location from the roof structure or cross members at the correct location and height relative to the floor.

[0009] If the installer is installing a device such as an outlet box, generally one piece of framing channel would be affixed to the outlet box and two pieces of threaded rod would be attached near each of the ends of the framing channel. This works rather poorly especially if the device is suspended a great distance from the roof structure as these long rods would cause the outlet box to swing back and forth and twist on the threaded rods. In addition, the outlet box would require drilling to allow the conduit to attach to the outlet box.

[0010] This problem can be solved by using a first piece of framing channel near the outlet (for example) with two pieces of threaded rod connected to a second piece of framing channel located relatively close to the outlet box and two longer pieces of threaded rod from the second piece of framing channel to the roof structure from which it is suspended. This configuration greatly complicates the installation of any suspended electrical device, greatly increasing time and costs of installation but does eliminate some of the swing and twist problems that can occur.

[0011] A great deal of measuring and cutting must be accomplished to suspend the electrical device and deter the swing and twist that can result. The longer threaded rods must, in some of the background art, be attached to the framing channel with fasteners such as nuts and bolts on both sides of the second piece of framing channel to help prevent the device from moving towards the ceiling. Likewise, some kind of fasteners must be used to attach the threaded rods to the first piece of framing channel. This requires much manual labor and time thereby increasing installation costs. In addition to the threaded rod attachments, the actual electrical device or connector must then be attached to the first framing channel to ultimately suspend the device over the floor at the correct location and elevation. There is also the probability that the fasteners will fail to the floor requiring added labor time in acquiring replacement hardware. The failing hardware can also pose a hazard to workers or equipment below.

[0012] Obviously there are many different types of electrical devices that could be suspended from the first framing channel such as electrical boxes, conduit, lights and fixtures, exit signs, and many others dependent upon the user’s needs.

[0013] As one can appreciate, this process can be extremely time consuming and thereby expensive.

[0014] Applicant has developed a device that eliminates a large amount of cutting, fitting and attaching of the framing channel or uni strut to affix a device at the appropriate height and location over the floor.

[0015] The Applicant’s device can accommodate a single threaded rod, a pair of threaded rods or a pair of and s-hooks and jack chain. The disclosed device requires much less measuring and assembly time, eliminates the uni strut with associated fasteners and simplifies the attachment of the electrical device to the applicants disclosed electrical device hanger. The device can thus be more easily located and installed and have the conduit which houses the wire that supplies power to the device affixed. For the foregoing reasons, there is a need for a new Electrical Device Hanger.

[0016] These together with other goals of these embodiments, along with various features of novelty which characterize these embodiments, are pointed out with particularity in the remaining portions of this disclosure. For a better
understanding of these embodiments and the operating advantages, reference should be had to the accompanying drawings and attached descriptive matter.

BRIEF DESCRIPTION OF DRAWINGS

[0017] FIG. 1 shows a front view of one embodiment of the background art method of attachment of a device at a preferred elevation and location.

[0018] FIG. 2 shows a side view of one embodiment of the background art method of attachment of a device at a preferred elevation and location.

[0019] FIG. 3 shows a front view of one embodiment of the Applicant's electrical device hanger attached to a device with dual threaded rods.

[0020] FIG. 4 shows a side view of one embodiment of the Applicant's electrical device hanger attached to a device with dual threaded rods.

[0021] FIG. 5 shows a top view of one embodiment of the Applicant's electrical device hanger.

[0022] FIG. 6 shows a bottom view of one embodiment of the Applicant's electrical device hanger.

[0023] FIG. 7 shows a front view of one embodiment of the Applicant's electrical device hanger.

[0024] FIG. 8 shows a front view of one embodiment of the Applicant's electrical device hanger attached with a single threaded rod.

[0025] FIG. 9 shows a front view of one embodiment of the Applicant's electrical device hanger attached with s-hooks and jack chain.

[0026] FIG. 10 shows a front view of one embodiment of the Applicant's electrical hanger device.

[0027] FIG. 11 shows a side view of one embodiment of the Applicant's electrical hanger device.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0028] Referring to the drawings in detail wherein like elements are indicated by the same reference numerals, there is shown in FIG. 1 a typical background art attachment of a first set of threaded rods 55 attached to a first channel 59. The threaded rods 55 are affixed to the first channel 59 with fasteners 57. The device 12 is attached to the second channel 61 with fasteners 57. A second set of threaded rods 55 attach first channel 59 to second channel 61 with fasteners 57. Also shown is conduit 64 through which electrical wire (not shown) is run which interconnects the power supply located near the ceiling or other location and the device 12 connected to hanger 14.

[0029] As can be appreciated, it is time consuming to affix the device 12 to the hanger 14 as shown in FIGS. 1 & 2. Much cutting, measuring of channel and attaching of fasteners 57 must occur to hang the device 12 as shown in this representation of the background art.

[0030] FIG. 2 shows a side view of the attachment of the hanger 14 of the background art to a device 12.

[0031] FIG. 3 shows the attachment of the applicant's hanger 14 to the device 12. As can be seen from this figure, threaded rods 55 are inserted through second hole 36 and fourth hole 40 in the top 36 of the hanger 14. FIG. 5. The threaded rods 55 extend to the bottom 18 where they are retained in the threads of sixth hole 43 and eighth hole 47. This embodiment also shows the threaded rods 55 securing the device 12 to the underside of the bottom 18 of the hanger 14. Device 12 can have corresponding threads matching the thread of the rods 55.

[0032] In comparing the background art to the configuration in FIG. 3, it can be appreciated the simplicity of this device and cost savings from materials and cost savings in installation time.

[0033] FIG. 5 shows first hole 34 through fifth hole 41 in the top 16 of the hanger. The holes 34, 36, 38, 40 and 41 are clearance holes sized to allow the threaded rod 55 to pass through. First hole 34 and fifth hole 41 in the top 16 of hanger 14 are clearance holes and are sized to allow the passage of an S-hook 50 which can be attached to jack chain 51. FIG. 9.

[0034] Applicant's figures do not show conduit 64 connecting the power supply and the device 12, but it is understood that conduit and the attachment of conduit from power supplies to electrical devices is known in the art. Any manner of attachment of the conduit from the power supply to the device 12 could be utilized in combination with the applicant's hanger 14.

[0035] Second hole 36, third hole 38 and fourth hole 40 in the top 16 of hanger 14 are sized to allow the threaded rod 55 to pass through without resistance but not large enough that the threaded rods 55 have an undesired amount of play. By example and in no way a limitation, second, third and fourth holes 36, 38 and 40 can be clearance holes for a 1/4" threaded rod. Obviously other size threaded rods would require a larger or smaller clearance hole.

[0036] FIG. 7 shows that second hole 36 in the top 16 is collinear with sixth hole 43 in the bottom 18 of the hanger 14 along left center line 30. Likewise, third hole 38 in the top 16 is collinear with seventh hole 45 in the bottom 18 of hanger 14 along center line 28. In the same fashion, fourth hole 40 in collinear with eighth hole 47 in the bottom 18 of hanger 14 along center line 32.

[0037] Sixth, seventh and eighth holes 43, 45, and 47 are threaded to match the thread of the threaded rods 55. This allows the threaded rods 55 to pass through the holes in the top 16 of the hanger 14 and to attach and be retained in the holes in the bottom of the hanger 14 via the interaction of the threads of the rod 55 and the threads in holes 43, 45 and 47.

[0038] As explained above and shown in FIG. 3, device 12 can have holes and threads that align with sixth hole 43 and eighth hole 47 such that threaded rods 55 can retain device 12 against or near the bottom 18 of hanger 14.

[0039] FIG. 3 shows the attachment of the device 12 to the bottom 18 of the hanger 14 where a fastener 57 can be used to attach the device 12, in this example, to the seventh hole 45. While this embodiment shows a nut attached to the fastener 57, it should be appreciated that the fastener 57 shown could be attached to the seventh hole 45 by the interaction of the fastener 57 threads and the threads cut in the seventh hole 45.

[0040] The hanger 14 can be stamped from a sheet steel and have the holes punched and thread and then have the ends welded together to form the shape of the hanger 14. Also notable are top angle 24 between the first side 20 and the top 16, FIG. 3, and top angle 24 between the second side 22 and the top 16. Top angle can be an angle greater than 90 degrees.

[0041] Also notable is bottom angle 26 between first side 20 and bottom 18 and bottom angle 26 between second side 22 and bottom 18. Bottom angle 26 can be less than 90 degrees.

[0042] It should be understood that top angle 24 and bottom angle 26 could also be 90 degree angles or some combination.
of angles which would depend upon the manufacturing method. What is important in these embodiments is that the center lines 28, 30, 32 align with their respective corresponding holes in the top 16 and the bottom 18 of hanger 14.

Hanger 14 could also be manufactured from materials other than sheet steel such as other ferrous and non-ferrous materials. It is anticipated that the hanger 14 could be manufactured from an extrusion where “slices” are cut from the extrusion and the holes drilled and tapped in the configuration as shown and described.

FIG. 8 shows a front view of applicant’s hanger 14 attached to a device 12. In this embodiment, the hanger 14 is attached to both the ceiling or upper attachment, not shown, and the device 12 by a single threaded rod 55. The threaded rod 55 passes through the third hole 38 in the top 16 of the hanger 14 and is affixed to seventh hole 45 in the bottom 18 of hanger 14. As shown threaded rod 55 may also be attached to a matching threaded hole in the device 12. Threaded rod 55 may also have a nut attached affixing the device 12 to the hanger (not shown). FIG. 8 also shows fasteners 57 inserted from the device 12 and into holes 43, 47 to provide additional strength to this junction. Conduit (not shown) is then run from the power supply to the device 12 as is known in the art.

FIG. 9 shows an alternative attachment method of the hanger 14. In this embodiment, a s-hook 50 is attached through second hole 36 and first hole 34 in the top 16 of the hanger 14. A corresponding s-hook 50 is attached through fifth hole 41 and fourth hole 40 in the top 16 of the hanger 14. The s-hooks 50 are then attached to jack chain 51. The jack chain 51 is then attached to the ceiling or upper structure in the ceiling, not shown. It should be understood that the s-hooks 50 could be inserted into the top 16 of the hanger 14 in the reverse, or inserted into first hole 34 and second hole 36 and fourth hole 40 and fifth hole 41 or the opposite of what is shown in this embodiment. Conduit (not shown) is run from the power supply to the device 12 as is known in the art.

While this embodiment shown does not eliminate the rotation and swinging of the device 12, some customers do request this manner of attachment. This embodiment can accomplish the less save time during installation if the device 12 can be affixed directly to the bottom 18 of the hanger 14 with fasteners 57 in threaded sixth, seventh and eighth holes 43, 45, 47 or some combination thereof.

FIG. 10 shows an alternative embodiment of the hanger 14. Hanger 14 is approximately u-shaped. As can be seen, the configuration of the first thru fifth holes 34, 36, 38, 40 and 41 are located in a top ledge 66 and sixth thru eighth holes 43, 45, 47 are located in a bottom ledge 68. In this embodiment there is a third side 23 which connects the top ledge 66 to the bottom ledge 68. Top ledge 66 and bottom ledge 68 are approximately parallel to one another and approximately perpendicular to third side 23 thereby forming the u-shape.

Third side 23 can also have one cutout 70 or more cutouts 70. This embodiment shows two cutouts 70. Cutouts 70 are used to strengthen hanger 14 from twisting and also result in hanger 14 having less weight. Cutouts 70 could also take a different shape and there could be more or fewer cutouts 70 or even no cutouts 70 depending upon the user’s application of hanger 14.

In this embodiment, first thru fifth holes 34, 36, 38, 40, 41 are clearance holes for threaded rod 55 and sixth thru eighth holes 43, 45, 47 are threaded matching the threads of threaded rod 55 as has been previously explained. Likewise as has been previously discussed, the first and second holes 34, 36 and fourth and fifth holes 40, 41 in top ledge 66 could be used to attach s-hooks 50, not shown.

The hanger 14 shown in FIGS. 10 and 11 provides an alternative embodiment for hanging devices 12 as has been previously described. The manufacturing of hanger 14 in FIGS. 10 and 11 may also be cheaper again providing significant benefits to devices shown in the background art.

It will now be apparent to those skilled in the art that other embodiments, improvements, details and uses can be made consistent with the letter and spirit of the foregoing disclosure and within the scope of this application.

What is claimed is:

1. A hanger for suspending electrical devices, the hanger comprising:

   a) u-shaped frame with a top ledge, the top ledge having a first side and a second side, the top ledge attached to a third side;
   
   the third side attached to a bottom ledge, the bottom ledge having a first side and a second side and approximately parallel to the top ledge;
   
   the top ledge and bottom ledge approximately perpendicular to the third side;
   
   the top ledge having a plurality of holes there thru, the holes approximately parallel to the third side;
   
   the bottom ledge having a plurality of holes there thru, the holes approximately parallel to the third side;
   
   at least two of the holes in the top ledge co-linear with two holes in the bottom ledge;
   
   the bottom holes threaded; and
   
   the third side having a cutout.

2. The hanger of claim 1, wherein:

   three holes in the top ledge co-linear with three holes in the bottom ledge.

3. The hanger of claim 1, wherein:

   one hole in the top ledge located midway between the first side and second side.

4. The hanger of claim 1, further comprising:

   the third side having two cutouts.

5. A hanger for suspending electrical devices on a threaded rod, the hanger comprising:

   a) U-shaped frame having a top ledge;
   
   the top ledge connected to a third side;
   
   the third side connected to a bottom ledge;
   
   the top ledge having a first side and a second side;
   
   the top ledge having a first hole near one edge of the top ledge, a second hole located approximately in the center of the top ledge, a second hole located between the first hole and the second hole, a fifth hole located near the second edge of the top ledge and a fourth hole located between the third hole and the fifth hole;
   
   the bottom ledge having a sixth hole located near one edge and a seventh hole located approximately in the center of the bottom ledge, an eighth hole located near the second edge of the bottom ledge;
   
   the second hole and the sixth hole located along a left center line extending through the top edge and through the bottom edge;
   
   the third hole and the seventh hole located along a center line extending through the top edge and through the bottom edge; and
   
   the fourth hole and the eighth hole located along a right center line extending through the top edge and through the bottom edge.


6. The hanger of claim 5, wherein:
the first hole, second hole, third hole, fourth hole and fifth hole are sized to allow the threaded rod to pass there thru.

7. The hanger of claim 5, wherein:
the sixth hole, seventh hole and eighth hole are threaded to match the threaded rod.

8. The hanger of claim 5, further comprising:
the third side has at least one cutout.

9. A hanger for suspending electrical devices on S-hooks attached to jack chains, the hanger comprising:
a U-shaped frame having a top ledge;
the top ledge connected to a third side;
the third side connected to a bottom ledge;
the third side having a first side and a second side;
the top ledge having a first hole near one edge of the top ledge, a third hole located approximately in the center of the top ledge, a second hole located between the first hole and the second hole, a fifth hole located near the second edge of the top ledge and a fourth hole located between the third hole and the fifth hole;

the bottom ledge having a sixth hole located near one edge and a seventh hole located approximately in the center of the bottom ledge, an eighth hole located near the second edge of the bottom ledge;
the second hole and the sixth hole located along a left center line extending through the top ledge and through the bottom ledge;
the third hole and the seventh hole located along a center line extending through the top ledge and through the bottom ledge; and
the fourth hole and the eighth hole located along a right center line extending through the top ledge and through the bottom ledge.

10. The hanger of claim 9, wherein:
the S-hook is attached through the second hole and the first hole of the top ledge and the second S-hook is attached through the fifth hole and the fourth hole of the top ledge.

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