May 20, 1958 S. S. KOLODIN 2,835,464

PIPE HANGER

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FIG. 1.

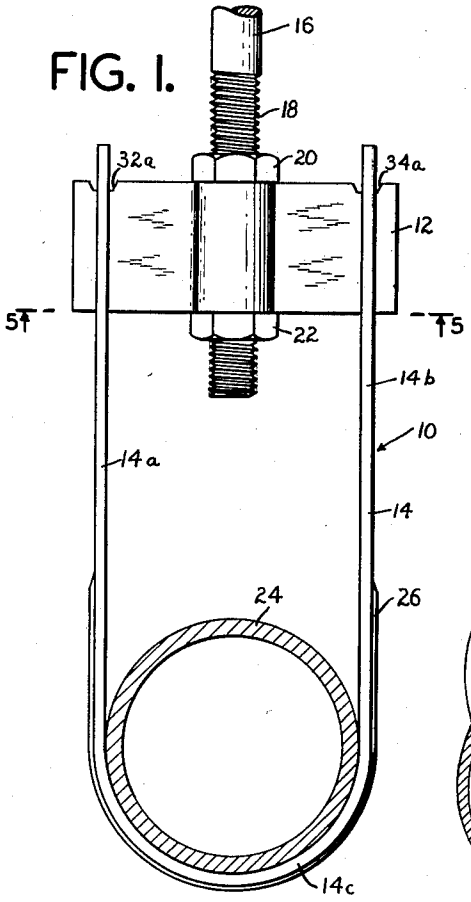


FIG. 2.

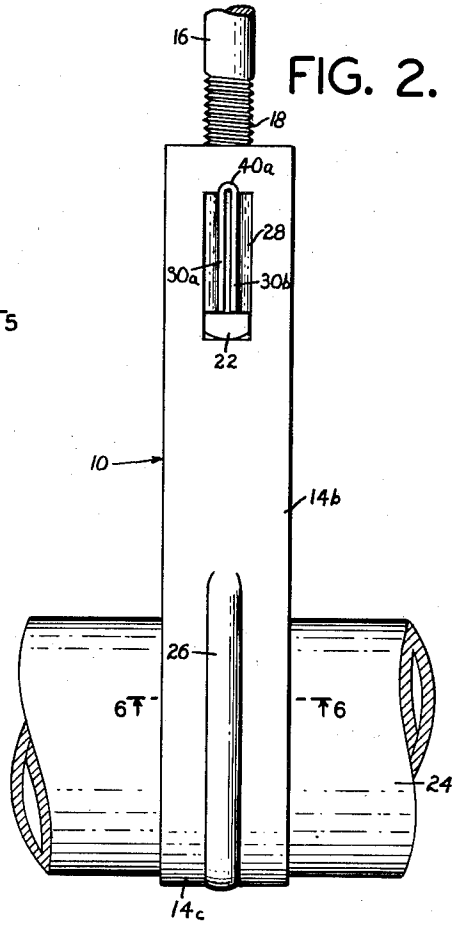


FIG. 3.

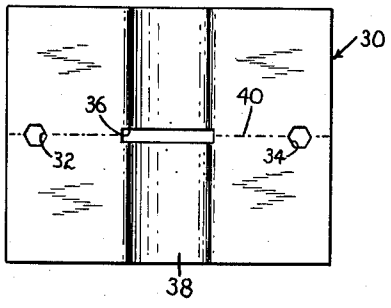




FIG. 4.

FIG. 5.

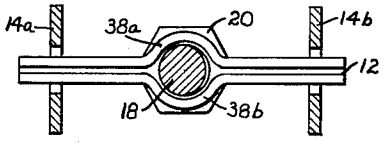
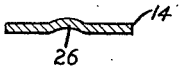


FIG. 6.



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PIPE HANGER

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FIG. 7.

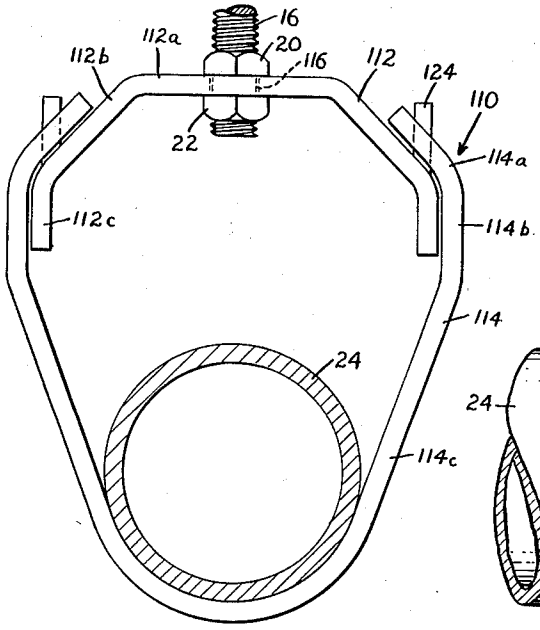
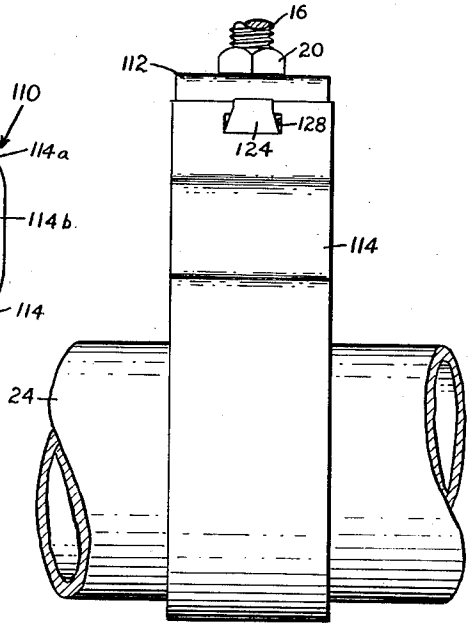


FIG. 8.



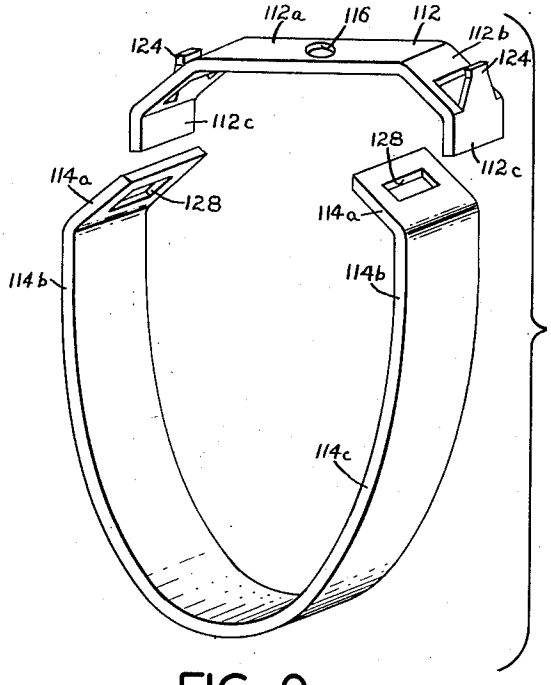


FIG. 9.

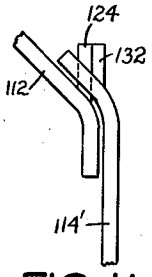
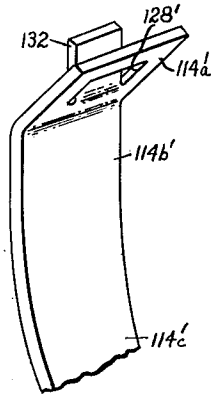


FIG. 11.

FIG. 10.



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PIPE HANGER

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5 Claims. (Cl. 248—62)

This invention relates to pipe hangers.

Conventional pipe hangers consist of an inverted U-shaped upper bar or bridge, a U-shaped strap and a bolt interconnecting the legs of the upper bar or bridge with the arms of the strap. This construction is relatively expensive since the cost of the bolt is out of proportion to the total cost of the other two components. Pipe hangers are used in very large quantities, especially in large apartment houses, factories and office buildings, and a saving of the few pennies that each bolt costs mounts up to a very substantial sum. Furthermore, bolt-type pipe hangers are somewhat awkward to handle and time consuming to install. Moreover, they lack sufficient strength to withstand the unusual stresses which are occasionally encountered.

It is the principal object of this invention to provide a pipe hanger which consists of only two interlocking parts capable of locking together without the use of bolts or any equivalent fastening means.

In the preferred embodiment of this invention, there is a cross bridge which is attached in conventional manner to the vertical bolt which hangs from the ceiling or other structural support. In addition to the cross bridge, there is a U-shaped strap which is adapted to interlock with the bridge and to depend or hang therefrom. The interlocking parts are based upon the principle of the common hook in an uncommon construction and application. The bridge is provided with a pair of notches formed in its upper edge adjacent its two ends. These notches, in effect, convert the bridge into a double ended hook or, stated differently, a double ended member with a hook formation at each end. The strap is provided with a pair of slots formed in registration with each other adjacent the upper ends of its two arms. These slots are adapted to receive the hook-shaped ends of the bridge and to enable the strap to hang from the notched portions of the bridge. Stated differently, the slotted arms of the strap are adapted to hook onto the notched ends of the bridge to support the strap from said bridge.

An important feature of this embodiment of the invention is the vertical position which the bridge occupies. In conventional pipe hangers, the bridge lies in the flat, that is, its wide dimension in the area of its engagement with the vertical ceiling bolt occupies a horizontal plane. In the present invention, the wide dimension of the bridge occupies a vertical plane throughout the entire length of the bridge. Consequently, the pipe hanger which is made in accordance with the present invention possesses great structural strength, exceeding by far the structural strength of conventional pipe hangers of like or corresponding proportions. This is true not only of the bridge element but it is equally true of the strap element. In conventional pipe hangers, the connecting bolt which interconnects the bridge and strap is disposed horizontally and a shearing force is applied thereto between the legs of the bridge and the arms of the strap. In normal use, the bolt is sufficiently strong to withstand such shearing

force. There are occasions, however, when the shearing force becomes abnormal and the bolt fails.

In the present invention, the strap hangs directly from the bridge and no shearing force is to be encountered which corresponds to the shearing force in the bolt-type pipe hangers. The strength of the pipe hanger will be determined solely by the strength of the materials used and in the case of the strap it would be tensile strength which would control.

An important feature of the present invention is the ease with which pipe hangers made in accordance therewith may be installed. The bridge is secured to the vertical bolt which projects downwardly from the ceiling, in conventional manner, and the pipe is now ready to be hung. It is elevated to a position slightly below the bridge, also in conventional manner. The strap is then caused to straddle the pipe and its slotted ends are caused to engage the hook-shaped ends of the bridge and the pipe is then permitted to drop down upon the strap. Once the bridge is secured to the vertical bolt, there is only a single element to handle and attach, namely, the strap. In conventional pipe hangers, there are three elements to handle after the bridge is attached to the vertical bolt, namely, the strap, the horizontal connecting bolt, and the nut therefor. Consequently, it is necessary to elevate the strap until its bolt holes register with the bolt holes of the bridge and it is then necessary to insert the bolt therethrough and to thread the nut thereon.

In a second embodiment of this invention, the bridge is supported in conventional manner from the vertical bolt, that is, the bridge is made to lie in the flat with its wide dimension in a horizontal plane in the area of its engagement with the vertical bolt. The bridge is provided adjacent its two ends with upwardly projecting lugs or hook members. The strap is slotted adjacent the upper ends of its arms to engage said hook members or lugs. Consequently, the same relationship exists as in the case of the first embodiment of the invention, that is, the strap is made to hang directly from hook formations on the bridge. There is no bolt which interconnects these two members.

An important feature of this second form of the invention is the inward bend with which the slotted ends of the strap are provided. This inward bend enables the slotted ends of the strap to overhang the hook formations on the bridge although the arms of said strap, below the bend, are spaced apart from each other a greater distance than the length or horizontal dimension of the bridge. This renders it possible to mount the slotted ends of the strap upon the bridge by simply moving the strap laterally or horizontally relative to the bridge with its said slotted ends elevated above the bridge and then to drop said strap when the slotted ends register with the hook formations on the bridge until said slotted ends are brought into engagement with said hook formations.

The invention is illustrated in the accompanying drawing in which:

Fig. 1 is a side view of a pipe hanger made in accordance with one form of this invention, showing, in section, a pipe supported thereby.

Fig. 2 is another side view thereof, being also a fragmentary side view of said pipe.

Fig. 3 is a plan view of a blank from which the bridge of said pipe hanger is made.

Fig. 4 is an edge view of said blank.

Fig. 5 is a horizontal section taken on the line 5—5 of Fig. 1.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 2.

Fig. 7 is a side view of a pipe hanger made in accord-

ance with a second form of this invention, showing, in section, a pipe supported thereby.

Fig. 8 is another side view thereof, being also a fragmentary side view of said pipe.

Fig. 9 is an exploded perspective view of the two components of said pipe hanger.

Fig. 10 is a modification of the upper portion of the U-shaped member of Figs. 7, 8 and 9.

Fig. 11 is a modification of the shoulder connection of the Figs. 7, 8 and 9.

Referring now to the first form of this invention and to the first six figures of the drawing, it will be seen that pipe hanger **10** consists of two component parts, namely, a bridge **12** and a strap **14**. This pipe hanger is supported from the ceiling or other structural member by a vertical threaded rod or bolt **16**. The lower end of said vertical rod or bolt is provided with screw threads **18** and with a pair of nuts **20** and **22** threaded thereon. It is these nuts which secure the pipe hanger to the vertical rod or bolt and which are adapted to adjust the position of said pipe hanger relative to said rod or bolt.

Strap **14** is a U-shaped member having a pair of substantially parallel arms **14***a* and **14***b* and an arcuate bight or yoke **14***c* joining said arms at their lower ends. It is this bight or yoke on which pipe **24** rests. To provide a measure of stiffness or rigidity and to insure proper spacing of the two arms of the strap, a longitudinally extending bead **26** is formed along said yoke **14***c* and approximately one third of the distance up along arms **14***a* and **14***b*. Fig. 6 is a sectional view through the strap showing the formation of said bead.

Formed at the upper end of each arm **14***a*, **14***b* is a slot **28** which extends longitudinally thereof. This slot is long enough to receive bridge **12** and wide enough also to receive said bridge and also to permit of some relative lateral movement and angular movement to maneuver the strap into engagement with the bridge. By way of illustration, if the bridge is approximately a quarter of an inch thick, slots **28** should be approximately three-eights of an inch wide. Similarly, assuming the bridge to be approximately one inch wide or high, slots **28** should be approximately an inch and an eighth long or high. These dimensions are purely illustrative and they will vary in accordance with individual engineering requirements and the weight and dimensions of the pipes to be supported by said pipe hangers.

Further by way of illustration, strap **14** may be made of one eighth inch thick steel, approximately one inch wide. Since slots **28** are approximately three eighths of an inch wide, the webs on both sides of each slot will each be approximately five sixteenths of an inch wide. The distance between arms **14***a* and **14***b* will depend upon the diameter of pipe **24** and upon whether it is desired to provide a snug fit or not. It may be found necessary to provide a free space between the said arms and the said pipe so as to enable the person installing the pipe hanger to turn the strap about the vertical axis of rod **16** in order to bring the slots **28** into alignment with the bridge **12**. It may be found necessary to turn the strap in this manner in order to mount one of its arms upon one end of the bridge and then to mount its other arm upon the other end of the bridge. Another possibility is to turn the bridge about the vertical axis of rod **16** in order to bring it within the confines of the two arms **14***a* and **14***b*.

Bridge **12** is made from blank **30**. This blank is substantially rectangular in shape and punched into it are two holes **32** and **34** respectively and a slot **36**. These holes may be hexagonal in shape and slot **36** may simply be a slit. In any case, blank **30** is bent centrally thereof to form an arcuately recessed portion **38**. A folding line **40** is also provided in said blank, centrally thereof, and normal to the recessed portion **38**. Holes **32** and **34** and slot or slit **36** are formed in alignment with each other along folding line **40**.

Blank **30** is folded or doubled upon itself upon folding

line **40** to form bridge **12** as shown in Figs. 1, 2 and 5. It will be noted that holes **32** and **34** form notches **32***a* and **34***a* in bridge **12**. It will also be noted that recessed portion **38**, actually two portions **38** on opposite sides of slot or slit **36**, forms a pair of arcuate yokes **38***a* and **38***b* which comprise a collar encircling vertical rod or bolt **16**. Folding line **40** becomes a bight or shoulder **40***a* as shown in Fig. 2. The two halves of blank **30**, on opposite sides of folding line **40** now become a pair of vertical sides **30***a* and **30***b* respectively which are parallel to each other and which may be, if desired, in abutment with each other. Also, if desired, these two sides may be attached to each other by welding, riveting or otherwise. Similarly, bridge **12** may be inverted on vertical rod or bolt **16** so that its bight **40***a* is disposed along its lower edge and the two free edges of sides **30***a* and **30***b* are disposed along its upper edge. In such case, of course, notches **32***a* and **34***a* would be formed in the free edges of said sides **30***a* and **30***b* instead of in bight **40***a*.

By way of illustration, blank **30** may be made of one eighth inch thick sheet steel. It may be about two inches wide and somewhat over two and a half inches long after recess **38** is formed therein. Consequently, when said blank is folded over to form bridge **12**, said bridge will be approximately an inch wide or high and approximately two and a half inches long. Vertical bolt or rod **16** is generally half an inch in diameter and consequently bridge **12** will have a web of approximately one inch long on each side of arcuate portions **38***a* and **38***b*. Since blank **30** is made of one eighth inch thick material, the bridge itself will be approximately a quarter of an inch thick and since the bridge is disposed in a vertical plane its strength will be extremely great.

Referring now to the second form of this invention and to Figs. 7, 8 and 9 of the drawing, it will be seen that pipe hanger **110** consists of two parts, a bridge **112** and a strap **114**. The bridge is a flat bar bent to form a yoke **112***a*, a pair of downwardly sloping shoulders **112***b* and a pair of legs **112***c*. The yoke is a horizontal member and the shoulders are inclined approximately 45 degrees relative thereto. Legs **112***c* project vertically downwardly from the lower ends of the shoulders.

A hole **116** is punched into yoke **112***a* to receive vertical rod or bolt **16** from which the entire unit depends. Nuts **20** and **22** on opposite sides of the yoke adjustably secure the yoke, and hence the entire bridge, to said vertical rod or bolt **16**. It will also be observed that tapered lugs **124** are struck out from shoulders **112***b* and that they project vertically upwardly in parallel relation to each other.

Strap **114** is also a flat bar, but not necessarily as thick or heavy as the material of which the bridge is made. It is bent to form a pair of inclined shoulders **114***a* which are disposed at an angle of approximately 45 degrees to the vertical. Below the shoulders **114***a* is a pair of vertical portions **114***b* and joining the lower ends of said vertical portions is a generally U-shaped portion **114***c*.

The arms of said U-shaped portion are not necessarily perfectly vertical and parallel to each other. Indeed, in the preferred construction, they converge in downward direction to form a relatively snug receptacle or support for pipe **24** as shown in Fig. 7. It will be observed in Fig. 9 that rectangular openings **128** are formed in shoulders **114***a* and these openings are of a size to receive lugs **124** above mentioned. There may be a slight taper in the walls defining said openings **128** to complement the taper of the lugs in order to provide a snug, frictional fit. The object is to prevent accidental disengagement of said strap from said lugs when the weight of the pipe is removed from the strap.

In use, the bridge **112** is secured to bolt **118** by means of nuts **20** and **22** and the pipe is hoisted (by conventional means not shown in the drawing) to a position below the bridge but above its final position illustrated in Fig. 7. The strap **114** is then brought into engagement with said bridge by hooking the shoulders of said strap

upon lugs 124 and bringing said shoulders into abutment with the shoulders of the bridge. Once this is done, the pipe is dropped into the U-shaped portion of the strap as appears in Fig. 7. It will be understood that all this is possible because the distance between the ends of shoulders 114*a* of the strap exceeds the diameter of the pipe and because said shoulders are adapted to overhang and overlap the shoulders of the bridge.

Reference to Figs. 10 and 11 will disclose a modified construction based primarily upon the construction of Figs. 7, 8 and 9. Bridge 112 shown in Fig. 11 is precisely the same bridge which is shown in Figs. 7, 8 and 9, and it will be noted that it is provided with upwardly projecting lugs 124. Strap 114*c'* shown in Figs. 10 and 11 is basically like the strap shown in Figs. 7, 8 and 9, except that its inwardly bent shoulders 114*a'*, which converge in upward direction from sides 114*b'*, are provided with upwardly extending lugs 132 adjacent openings 128' in said shoulders. When the strap is mounted on the bridge, lugs 132 will abut lugs 124 to reinforce lugs 124, as Fig. 11 clearly shows.

The foregoing is illustrative of preferred forms of this invention and it will be understood that modifications may be incorporated therein within the broad spirit of the invention and the broad scope of the claims.

I claim:

1. A pipe hanger which is adapted to be supported by a vertical rod or the like projecting downwardly from a ceiling or other structural support, said pipe hanger comprising a bridge adapted to be supported by said vertical rod and a strap supported by said bridge, said bridge having a flat horizontal yoke portion with a hole formed centrally thereof to receive said vertical rod and being provided with a pair of downwardly bent shoulders at the ends of said yoke diverging downwardly therefrom, said strap comprising a generally U-shaped member whose upper ends are bent inwardly converging in upward direction to conform to the bend of the shoulders of said bridge so as to be supported thereon, said shoulders being provided with upwardly projecting lugs and said inwardly bent upper ends of the strap being provided with openings to receive said lugs in order to lock the strap to said bridge.

2. A pipe hanger in accordance with claim 1, wherein the lugs are struck out of said shoulders and project generally vertically upwardly therefrom, vertically extending lugs being also formed on the inwardly bent upper ends of the strap adjacent the openings therein, and adapted to abut the lugs on the shoulders.

3. A pipe hanger in accordance with claim 1, wherein the yoke occupies a generally horizontal plane and the shoulders are inclined approximately 45 degrees relative thereto, the inwardly bent upper ends of the strap being also inclined approximately 45 degrees relative to the horizontal so that they may rest flat against said shoulders.

4. A pipe hanger in accordance with claim 1, wherein the bridge is provided with a pair of downwardly extending legs at the ends of its said shoulders, the strap being provided with portions immediately below its inwardly bent upper ends which abut said downwardly extending legs of the bridge and are supported thereby against inward distortion.

5. A pipe hanger in accordance with claim 1, wherein the lugs on the bridge are spaced a greater distance apart than the diameter of a pipe adapted to be carried by the strap and the upper inwardly bent ends of said strap are spaced apart a greater distance than the diameter of said pipe.

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