

Sept. 12, 1967

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3,340,653

ASSEMBLY AND GUTTER HANGING DEVICE THEREFOR

Filed May 3, 1965

2 Sheets-Sheet 1

FIG. 1

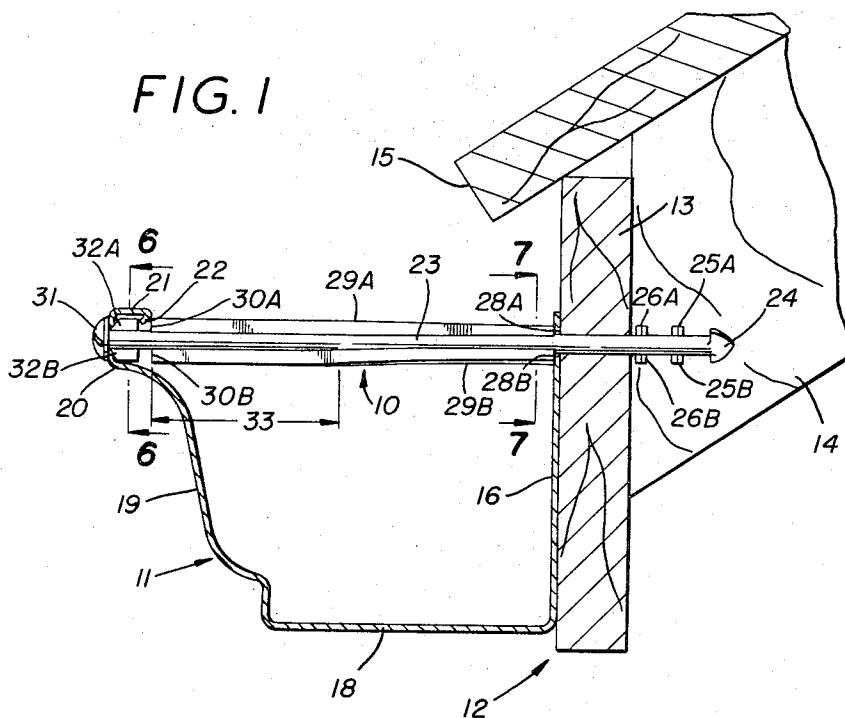
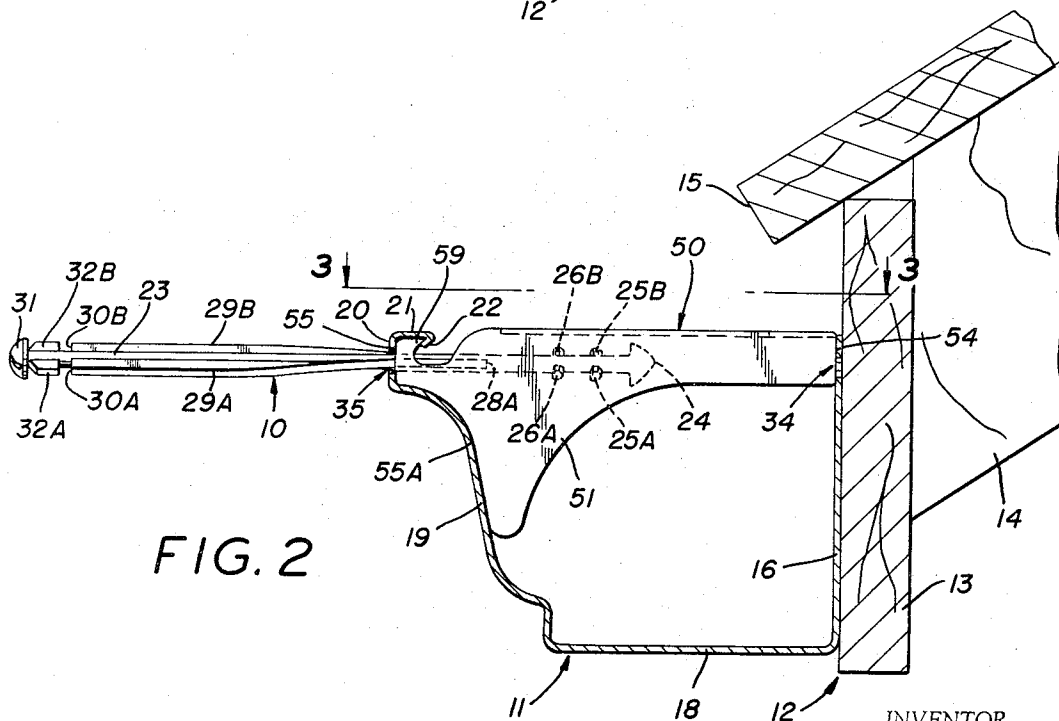


FIG. 2



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2 Sheets-Sheet 2

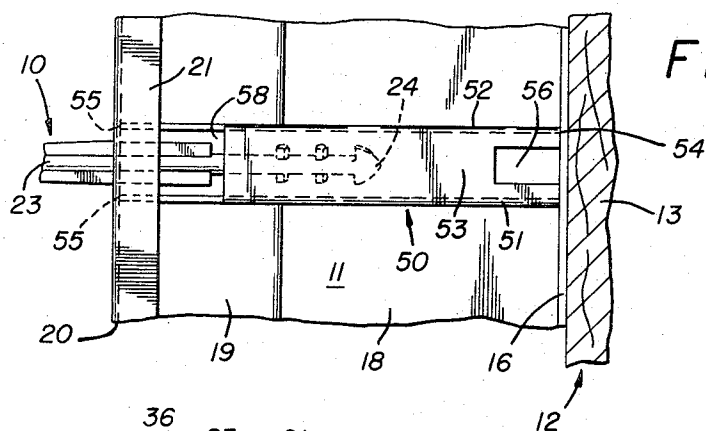


FIG. 3

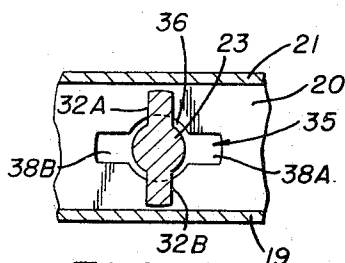


FIG. 6

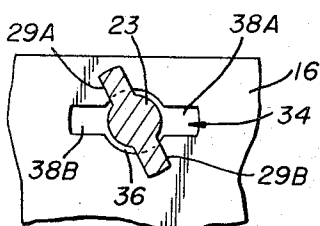


FIG. 7

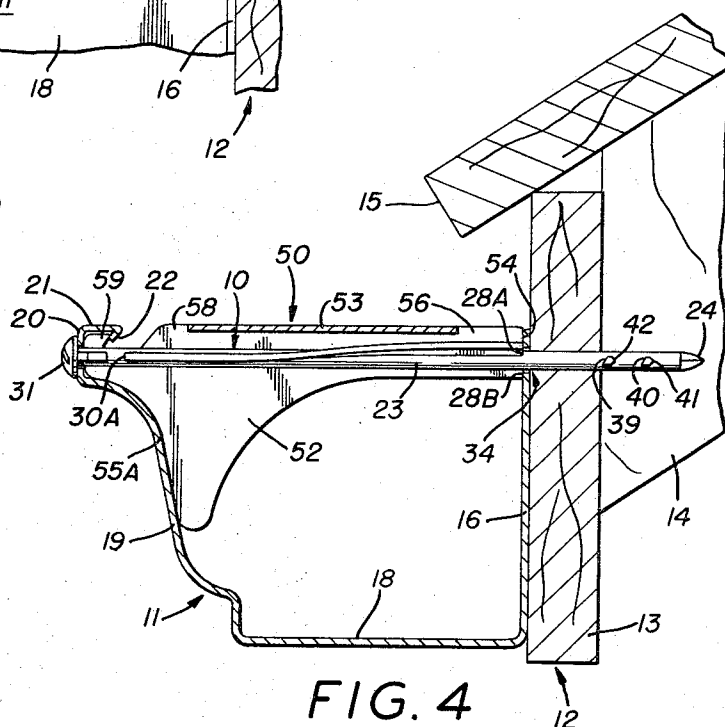


FIG. 4

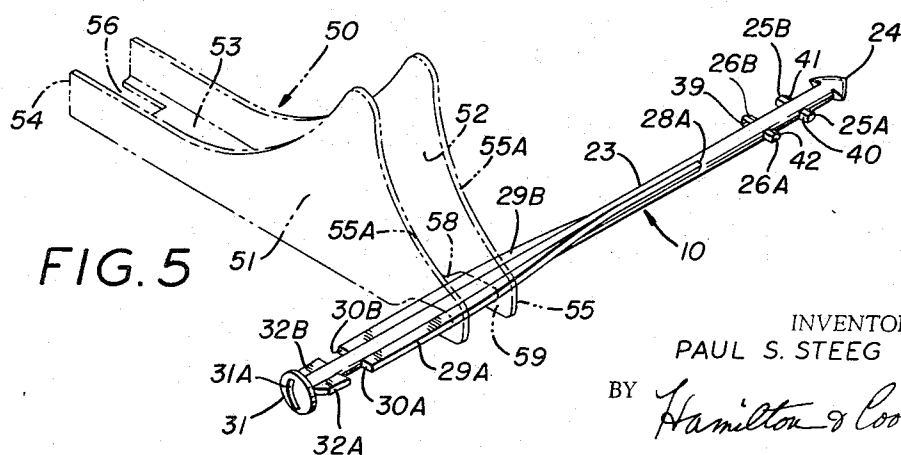


FIG. 5

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3,340,653 GUTTER ASSEMBLY AND HANGING DEVICE THEREFOR

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12 Claims. (Cl. 52—11)

ABSTRACT OF THE DISCLOSURE

A device for hanging gutter spouts to support means on a building and, by the construction of the hanger device, for imparting lateral stability to the gutter itself. The device has a shaft-like body with a sharpened tip on one end and a head on the other end. One or more lugs extend radially of the shaft rearwardly of the sharpened tip lockingly to engage, preferably behind, the support means on which the gutter is mounted. A first shoulder means is spaced rearwardly of the lock lugs so as to maintain the backwall of the gutter against the support means. The head engages the outer surface on the front rim of the gutter and a second shoulder, which also extends radially of the shaft, engages the inward facing portion of the rim.

The present invention relates generally to gutter spouts. More particularly, the present invention relates to a means for connecting a gutter spout in proper proximity to the eaves to receive and carry away rain water in the usual manner. Specifically, the present invention relates to gutter spout hangers which serve to attach the gutter spout to a building and at the same time act as a strut to give lateral stability to the gutter spout.

A gutter spout, or, as it is commonly termed, a gutter, must be supported in two ways. It must be secured to the building in a manner sufficient to prevent its falling when subjected to loading incident to its purpose. For example, the means by which the gutter is attached to the building must be able to support not only the weight of the gutter itself but also the weight of water, leaves, ice or other material which may be deposited therein.

Second, the gutter must have sufficient lateral rigidity to prevent distortion when subject to the weight of the aforementioned interior loadings, including the expansion of the water as it turns to ice, or when subjected to such exterior loadings as occur when a ladder is leaned thereagainst.

Heretofore, myriad hangers have been devised. However, in the main they tend to be either of two distinct types, or a hybrid variety.

One type hanger is that which connects directly onto the fascia board. The fascia board is generally no more than five-quarters dimensional stock, and more often one inch material. Therefore, the holding power of a spike, or nail, is severely reduced by the limited maximum penetration available, unless, of course, the nail extends into the ends of the rafter to which the fascia board is itself nailed. Even this provides a limited penetration on steep roofs. Moreover, the rafter ends are often quite difficult to locate when the mounting holes are pre-punched in the gutter or when the fascia board has been properly painted.

The second type of gutter hanger is often referred to as a "strap hanger." Strap hangers attach to the gutter and extend upwardly therefrom over the eaves and are nailed onto the roof. Inasmuch as gutters are generally mounted after the roofing material has been installed and after at least initial painting of the fascia board, the use of strap hangers requires either that a portion of the roofing be removed for their installation or that they be applied over the top of the roofing material. The former is too expensive and the latter not only extremely unsightly but

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often results in causing the roof to leak where the nails penetrate the roofing material.

Hybrid varieties of roof hangers employ both the direct nailing onto the fascia and the strap hangers, the two forms being combined into a single hanger device.

Lateral rigidity is often imparted to the gutters by incorporating a bracing means into the gutter itself. This is quite expensive, and the braces are not always placed where most needed. Other heretofore known bracing means consist of separate spacers which cooperate with the hangers to impart a modicum of lateral rigidity. These are generally difficult to install, require dexterous manipulation inconvenient to the workmen during installation of the gutter, and, if they are made of sufficient stability to do the job, add unnecessarily to the expense.

It is, therefore, an object of the present invention to provide a gutter hanger which is attachable to the fascia board in such a unique manner that the holding power is not dependent solely upon the frictional engagement between the wood and the penetrating portion of the hanger.

It is another object of the present invention to provide a gutter hanger, as above, which also serves as a reinforcing strut to impart lateral rigidity to the gutter.

It is still another object of the present invention to provide a gutter hanger, as above, which assures that the laterally spaced, longitudinal walls of the gutter will be spaced apart at a predetermined distance.

It is a further object of the present invention to provide a gutter hanger, as above, which can be applied quickly and easily by one workman.

It is a still further object of the present invention to provide a gutter hanger guide for use with the gutter hanger, as above, which maintains the gutter laterally rigid at the location where the gutter hanger is being applied during the time it is being driven into the building on which the gutter is being mounted.

It is a still further object of the present invention to provide a gutter hanger guide which is cooperatively engageable with the gutter hanger, as above, to lock the gutter hanger to the building and is thereafter removable from the gutter hanger and reusable.

These and other objects which will become apparent from the following specification are accomplished by means hereinafter described and claimed.

One preferred embodiment of the gutter hanger and gutter hanger guide are shown by way of example in the accompanying drawings and hereinafter described in detail without attempting to show all of the various forms and modifications in which the invention might be embodied; the invention being measured by the appended claims and not by the details of the specification.

In the drawings:

FIG. 1 is a cross section through a gutter mounted with a gutter hanger constructed according to the concept of the present invention;

FIG. 2 is a view similar to FIG. 1 showing the gutter hanger extending partially through the gutter and with a gutter hanging tool positioned within the gutter to impart lateral rigidity thereto while the hanger is being attached in operative position;

FIG. 3 is a top plan view taken substantially on line 3—3 of FIG. 2;

FIG. 4 is a cross sectional view similar to FIG. 2 with the gutter hanger fully inserted but not locked;

FIG. 5 is a perspective view of the subject gutter hanger depicting the gutter hanger guide in phantom, cooperatively engaged with the gutter hanger for rotation thereof;

FIG. 6 is an enlarged cross section taken substantially on line 6—6 of FIG. 1; and

FIG. 7 is an enlarged cross sectional view taken substantially on line 7—7 of FIG. 1.

In general, a gutter hanger constructed according to the present invention is generally nail-like in appearance. It has a shaft portion with a head on one end and a sharpened tip on the other. Extending radially outwardly of the shaft portion between the head and the tip are particularly spaced shoulders and lock lugs. These radial extensions are placed so that the lock lugs immediately rearwardly of the tip cooperate with the fascia board or rafters to secure the hanger against easy withdrawal. The shoulders and head cooperate with the gutter to provide predetermined spacing between the rim and backwall thereof, as well as assuring the desired lateral stability to the gutter.

Referring more particularly to the drawings for a detailed disclosure of the preferred embodiment, the improved gutter hanger, indicated generally by the numeral 10, is shown, in FIG. 1, mounting the gutter 11 to the building 12.

The building has a fascia board 13 secured to the rafters 14 beneath the eaves 15 which provides a suitable support means for the gutter 11.

The gutter 11 has a backwall 16 the inner surface of which abuts the fascia board 13. The base 18 of the gutter 11 extends outwardly from the backwall 16 away from the fascia board 13 and then turns upwardly into the smooth reverse curve of an ogee 19. The uppermost extent of the ogee 19 terminates in an upwardly extending rim 20 which is spaced outwardly of, and generally parallel to, the backwall 16. A lip 21 extends inwardly from the rim 20 toward the backwall 16 and is generally turned under, as at 22, to form a folded lip. The gutter 11 heretofore described is a standard construction.

The gutter hanger 10 by which the gutter 11 is mounted to the fascia board 13 has a shaft portion 23, the innermost end of which terminates in a tip 24 which is sharpened to facilitate penetration through the fascia boards, and into the end of a rafter 14, if necessary. This tip 24 is preferably of arrow-head shape for reasons more fully hereinafter apparent.

Rearwardly of the sharpened tip 24 a plurality of lock lug means extend radially outwardly of the shaft portion 23. As shown, these comprise two pairs of diametrically extending lock lugs 25A, 25B, and 26A, 26B.

In spaced relation rearwardly of the lock lugs 26 are radially disposed shoulders 28A and 28B formed by the forwardmost portion of the diametrically extending spines 29A and 29B. The lock lugs 26 are spaced forwardly of shoulders 28 sufficiently so that the shoulders 28 engage and firmly retain the backwall 16 against the outer surface of the fascia board 13 with the lock lugs 26 in firm engagement with the rear face of the fascia board. This firm engagement of the lock lugs 26 behind fascia 13 locks the hanger 10 against removal. The manner in which these lock lugs are so positioned will be more fully hereinafter explained in conjunction with the mounting procedure.

It should be noted from the perspective view of the hanger 10 depicted in FIG. 5 that the lock lugs 26A and 26B and the shoulders 28A and 28B are not axially aligned, rather the shoulders 28 are radially offset with respect to the lock lugs, as shown, approximately 45°.

A second pair of radial shoulders 30A and 30B extend diametrically outwardly of the shaft portion 23 in spaced relation forwardly of the head 31 on the rearmost end of the shaft portion 23. As shown in FIG. 1, the head 31 engages the outer surface of the rim 20, and the shoulder 30A engages the innermost extent of the lip 21.

At this point it can be understood that by a predetermined spacing of the lock lugs 26, the shoulders 28 and 30 and the head 31, the hanger 10 not only assures a fixed distance between the rim 20 and the backwall 16, but also imparts rigidity to the gutter.

For the best results, it has been found most desirable to employ a pair of diametrically extending second lock

lugs 32A and 32B extending radially of shaft portion 23. The forward edge of one of the second lock lugs 32A engages the folded lip 22, and the rearward edge of the two second lock lugs 32 engage the inner surface of the rim 20. This relieves the necessity for the lip 21 to support all the exteriorly applied lateral forces and permits a full utilization of the columnar strength of the hanger 10.

With respect to the orientation of the second shoulders 30 it must be noted that they are preferably axially aligned with the lock lugs 26, and, for that matter, are also axially aligned with the second lock lugs 32. The reason for this too will become perfectly clear upon explanation of the mounting procedure.

While the shoulders 28 and 30 may be independently attached to the shaft portion 23, the spines 29 greatly facilitate mounting the hanger 10 in operative position. The rearmost extent of the spines 29, at least for a distance 33 equal to the distance from the shoulders 28 to the tip 24, is axially oriented. After this minimum axial extent is satisfied, the spines 29 may be helically conjoined to the shaft portion 23, as shown. The extent of the helical conjuncture need only be sufficient to disalign the shoulders 28 from the lock lugs 26 so that they are radially inclined, as discussed above.

As shown in FIGS. 6 and 7 a preshaped opening 34 may be provided in the backwall 16 oppositely in identical opening 35 in the rim 20. The openings 34 and 35 depicted have a central circular configuration 36 with diametric slots 38A and 38B. This double keyhole slot readily accepts the cross section of the hanger 10 at any given location along its extent except the head 31 and therefore is most suitable for admission of the hanger therethrough. It is also the best configuration for fulfilling the self-positioning aspect of the hanger 10. Should the gutter not be provided with such openings the arrow-head shaped tip 24 has been found most suitable for forming such an opening on penetration. It is, of course, also quite feasible that the openings would not be completely punched but merely coined as knockouts of the desired shape.

To mount a gutter 11 with a gutter hanger 10, the tip 24 and lock lugs 25 and 26 are passed through the opening 35 in the rim 20. The first shoulders 28, however, cannot enter the opening 35 until the hanger 10 is partially rotated—for the embodiment disclosed the hanger 10 must be rotated 45° about the axis defined by the straight shaft portion 23. After the shoulders 28 enter opening 35 in rim 20 the helically disposed portion of the spines 29 cause the hanger 10 to rotate 45° in a reverse direction so that when the tip 24 reaches the opening 34 in backwall 16 and the lugs 25 and 26 will be properly disposed to pass through the opening 34.

As the tip 24 and lugs 25 and 26 pass through the opening 34, the axially disposed extent 33 of the spines 29 passing through opening 35 in rim 20 maintain a constant orientation of the hanger until the shoulders 28 engage the backwall 16. Inadvertent overpenetration is thus obviated, and with the outer surface of the rim 20 engaging the head 31, the desired separation of the rim and backwall is indicated. When the installer is assured that this disposition is obtained he rotates the hanger 10 sufficiently to lock the shoulder 30A against the lip 21 which also positions the lock lugs 26 behind the undamaged fibers of the fascia 13. This may be done with any suitable tool such as the claw of a claw hammer, or with a special hanger guide hereinafter described. Also a screw driver slot 31A may be provided in the head 31. In those embodiments employing second lock lugs 32 this rotation positions them in locked position between the rim 20 and the folded lip 22. It may be also observed that the rearward surface of the lock lugs 32 are slightly outwardly divergent from the head 31. This facilitates rotation of the hanger even when a bur might extend inwardly from the opening 34, as is highly possible when the opening 35 is formed solely by penetration of the arrow-head shaped tip 24. While it has not been deemed necessary, one may

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helically bevel the rearmost surface 39 of the lock lugs 26 so that with some woods the lugs can more easily engage the rear surface of the facia 13 without damaging additional fibers. Moreover, should the lugs 25 or 26 be embedded in wood, such as the ends of the rafters 14, the beveling of surface 39 on lugs 26 and similarly beveling the surface 40 on lugs 25 provides an inclined plane which may be thought to compress the fibers rather than tearing them so that a firm anchor is established.

It should also be noted that the forwardmost edges 41 and 42 of the lugs 25 and 26, respectively are also sharpened to facilitate penetration of the lugs through the facia 13 when the hanger 10 is being driven into position.

As best seen in FIGS. 2-5, a hanger guide, mounting tool, 50 is of great assistance to the workman when fastening a gutter 11 by a hanger 10. The guide tool 50 has a generally channel-shaped cross section with sidewalls 51 and 52 joined in spaced relation by a web 53 which together form a bridge between the backwall engaging rear edge 54 and the rim engaging front edge 55. For added stability the front edge is coved, as at 55A, to conform to the ogee 19 of the gutter 11. With the mounting tool fitted transversely of the gutter at the location where the hanger 10 is to be driven, sufficient lateral rigidity is imparted to the gutter that even if the preformed openings 34 and 35 are not provided the piercing of the gutter material by the hanger 10 will form them. Irrespective of the manner in which the openings are provided the web 53 has notched recesses 56 and 58 at the inner and outer ends, respectively, to permit the workmen to observe the disposition of the hanger at these critical locations during the mounting operation.

In any event, once the hanger 10 has been fully driven into place, as shown in FIG. 4, the guide 50 can be removed. The hook 59 recessed into the bridge portion of the guide 50 is adapted to engage the spines 29, as shown in FIG. 5, so that the workman may grasp the guide 50 in proximity to the backwall engaging edge 54 and use the guide 50 as a wrench to rotate the hanger 10 from the fully driven position of FIG. 4 into the final locked position depicted in FIG. 1. This hook 59 is also preferably placed in sufficient proximity to the rim engaging edge 55 to be positionable under the folded lip 22, as shown in FIG. 2.

While the disclosed preferred embodiment utilizes spines 29 having a portion helically conjoined to the shaft 23, from the above description it should also be now apparent to one skilled in the art that a hanger constructed according to the concept of the present invention could possibly have spines 29 axially oriented throughout their entire length. However, for such a construction the opening 35 in rim 20 would have to be inclined with respect to the opening 34 in the backwall 16, at least on the same order as the shoulder 28 is inclined with respect to the lock lugs 25 and 26.

The arrow-head shape of the sharpened tip 24 may raise the question in the minds of some who read this specification as to how the hanger 10 is rotated into the locking engagement described above if the tip 24 is buried into the end of a rafter 14. In such a situation it has been found that the tip 24 remains stationary and that section of the shaft portion 23 between the tip 24 and the shoulders 28 takes a permanent set, or twist, upon application of a torsional force by hanger guide 50. And, it has been found that the torsional moment required to twist a typical hanger 10 is of moderate dimension. For example, with a typical hanger 10 in which the shaft portion 23 is on the order of three-eighths of an inch in diameter and fabricated from a mild steel having a yield point unit stress of 30,000 pounds per square inch, the torsional moment required to set the twist would only be approximately 50 inch-pounds.

It should therefore be apparent that the presently taught gutter hanger could be applied with ease by a workman having no more than a hammer and a hanger

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guide 50 so as to be non-withdrawably secured into the building on which the gutter is mounted, to impart lateral rigidity to the gutter so mounted and otherwise accomplish the objects of the invention.

What is claimed is:

1. In combination with a gutter having a backwall presenting an outer surface and an inner surface at least a portion of which is adapted to mount against a support means and a front rim having an outer surface and an inwardly facing portion, a gutter hanger, said gutter hanger having a shaft portion extending through the backwall and front rim, a sharpened tip on the forward end of said shaft portion penetrating into said support means, a head on the rearward end of said shaft portion engaging the outer surface of said rim, lock lug means extending outwardly of said shaft portion and engaging said support means in spaced relation forwardly of said gutter backwall, a first shoulder means spaced rearwardly of said lock lug means and engaging the outer surface of said backwall, a second shoulder means spaced forwardly of said head and engaging the inwardly facing portion of said rim.

2. In combination with a gutter having a backwall presenting an outer surface and an inner surface at least a portion of which is adapted to mount against a support means and a front rim having an outer and inner surface with a folded lip extending inwardly from the rim toward the backwall, a gutter hanger, said gutter hanger having a shaft portion extending through the backwall and front rim, a sharpened tip on the forward end of said shaft portion penetrating into said support means, a head on the rearward end of said shaft portion engaging the outer surface of said rim, first lock lug means extending outwardly of said shaft portion and engaging said support means in spaced relation forwardly of said gutter backwall, a first shoulder means spaced rearwardly of said lock lug means and engaging the outer surface of said backwall, a second shoulder means spaced forwardly of said head and on the opposite side of said rim from said head and engaging said lip, a second lock lug means spaced forwardly of said head and rearwardly of said second shoulder means and engaging between the inner surface of said rim and said folded lip.

3. In combination with a gutter having a backwall presenting an outer surface and an inner surface at least a portion of which is adapted to mount against a support means and a front rim having an outer and inner surface with a folded lip extending inwardly from the rim toward the backwall, a gutter hanger, said gutter hanger having a shaft portion extending through shaped openings in the backwall and front rim, a sharpened tip on the forward end of said shaft portion engaging the outer surface of said rim, lock lug means extending outwardly of said shaft portion, said tip and lock lug means adapted to be extendible through said shaped openings in the rim and backwall with the tip penetrating into and said lug means engaging said support means in spaced relation forwardly of said gutter backwall, a first shoulder means spaced rearwardly of said lock lug means and being radially offset with respect to said lock lug means so as to engage the outer surface on said backwall and a second shoulder means spaced forwardly of said head and engaging the innermost extent of said lip.

4. A combination, as set forth in claim 3, in which the second shoulder means is radially offset with respect to the first shoulder means and said hanger, at least between said first and second shoulder means, being at least partially rotatable to position said second shoulder means into and out of engagement with the innermost extent of said lip.

5. In combination with a gutter having a backwall presenting an outer and an inner surface at least a portion of which is adapted to mount against a support means and a front rim having an outer and an inner surface with a

lip extending inwardly from the rim toward said backwall, a first shaped opening in said backwall, a second shaped opening in said rim oppositely the shaped opening in said backwall, a gutter hanger, said gutter hanger comprising, a shaft portion extending through the shaped openings in said rim and backwall, a sharpened tip on the forward end of said shaft portion, a head on the rearward end of said shaft portion engaging the outer surface of said rim, at least one pair of first lock lugs rearwardly of said tip extending diametrically outwardly of said shaft portion and engaging said support means in spaced relation forwardly of said gutter backwall, a pair of spines extending diametrically outwardly of said shaft portion, at least one of said spines terminating, at its forward extent, in a shoulder spaced rearwardly of the first lock lugs and angularly offset with respect to said first lock lugs engaging the outer surface of said backwall and thereby maintaining said backwall rigidly against said support means, at least one of said spines terminating at its rearward extent in a second shoulder spaced forwardly of the head engaging the lip on said front rim and thereby imparting lateral stability to said gutter, said hanger being at least partially rotatable to position said second shoulder in engagement with said lip.

6. A combination, as set forth in claim 5, in which the second shoulder is axially aligned with said first lock lugs.

7. A combination, as set forth in claim 6, in which at least one pair of second lock lugs extend radially outwardly of said shaft portion in spaced relation forwardly of said head and in spaced relation rearwardly of said second shoulder, said second lock lugs being aligned with said second shoulder.

8. A combination, as set forth in claim 6, in which a portion of the axial extent of said spines are axially conjoined to said shaft portion, said axial conjoined portion extending forwardly of said second shoulder means at least a distance equal to the distance between said first shoulder and said tip.

9. A gutter hanger comprising, a shaft portion, a sharpened tip on the forward end of said shaft portion, a head on the rearward end of said shaft portion, a spine means extending radially outwardly of said shaft portion, the

forward extent of said spine means forming a first shoulder means spaced rearwardly of said sharpened tip, lock lug means extending radially outwardly of said shaft between said sharpened tip and said first shoulder means, said lock lug means being radially offset with respect to said first shoulder means, the rearward extent of said spine means forming a second shoulder means radially offset with respect to said first shoulder means and in spaced relation forwardly of said head, the rear portion of said spine means extending axially along said shaft forwardly from said second shoulder means at least a distance equal to the distance between the first shoulder means and the forwardmost radial projection from said shaft.

10. A gutter hanger, as set forth in claim 9, in which the spine means comprises a single pair of diametrically opposed spines helically conjoined to the shaft forwardly of that extent thereof which is axially oriented.

11. A gutter hanger, as set forth in claim 10, in which the forwardmost radial projection is the tip which is sharpened to the shape of an arrowhead.

12. A gutter hanger, as set forth in claim 11, in which the lock lug means comprises a pair of diametrically extending lugs aligned with the said arrowhead-shaped tip and in which a second lock lug means extends radially outwardly of said shaft between said head and said second shoulder means, said second lock lug means being aligned with said second shoulder means.

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