Title: HINGED BRACKET ASSEMBLY FOR A DRAIN TROUGH

Abstract

A hinged bracket assembly (10) for use in mounting a drain trough (11) beneath the eaves of a building and enabling the trough (11) to be inverted to facilitate the cleaning and servicing thereof. The assembly is of sturdy construction comprised of two major components (12, 13), each of which can be economically fabricated from metal or plastic by molding techniques or by cutting operations applied to extruded structures.
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DESCRIPTION

TITLE: HINGED BRACKET ASSEMBLY FOR A DRAIN TROUGH

(5) TECHNICAL FIELD

This invention relates to an improvement in a drain trough system generally associated with the eaves of a roof of a building, and is more particularly concerned with a device which facilitates the mounting and maintenance of drain troughs.

(10) BACKGROUND ART

Most residential-type houses or dwellings are constructed with pitched roofs, the sloped nature of which prevents the accumulation of water thereon. Beneath the lower extremity of a pitched roof, generally referred to as the eaves, there is positioned a drain trough or gutter, the purpose of which is to catch water which runs off the roof, and channel it to a downspout which leads the water away from the foundation of the house.

(15) In the course of time, such drain troughs tend to accumulate debris such as fallen leaves, which obstructs the trough, thereby rendering it ineffective for its intended purpose. Also, in the course of time, the trough, usually of metal construction, may require maintenance such as scraping and/or painting. The servicing of such troughs for the purposes of cleaning or painting generally requires the use of a ladder, which makes the task difficult and often perilous.

Although a number of methods have been previously disclosed for simplifying the servicing of eaves-mounted
(2)
drain troughs, none have been completely successful in
operation or sufficiently practical to enjoy widespread
commercial utilization. Mechanically modified drain
(5) troughs have been proposed, such as the one disclosed in
U.S. Patent 538,108, issued April 23, 1895, which enables
the trough to be manually tilted or inverted so that its
contents will dump out. However, the specific features of
such systems generally require use of costly non-standard,
(10) specifically constructed drain troughs. Also, their
installation onto the eaves of a house may be so difficult
as to render them impractical. This is particularly the
case with modern houses wherein the roof overhangs by not
more than about two inches the upper peripheral wooden
(15) trim panels of the underlying walls, said panels being
generally referred to as the fascia.

The use of hinged brackets to mount a standard drain
trough to the fascia in a manner permitting inversion of
said trough to discharge its contents has been disclosed
(20) in U.S. Patent 4,014,074.

It is an object of the present invention to provide an
improved hinged bracket for use in mounting a conventional
drain trough to the fascia of a building.

It is another object of this invention to provide a
(25) bracket of the aforesaid nature adapted to permit said
trough to be inverted so as to discharge its contents.

It is a further object to provide a bracket of the
aforesaid nature which, in comparison with prior devices,
is of more sturdy construction, and less costly to fabri-
(30) cate.
These objects and other objects and advantages of the invention will be apparent from the following description.

**DISCLOSURE OF INVENTION**

(5) The above and other beneficial objects and advantages are accomplished in accordance with the present invention by an improved hinged bracket assembly comprising an upper harness member pivotably joined to a lower support bracket member.

(10) The harness member is constructed so as to hold or enclasp a conventional drain trough in a slideably adjustable manner for the preliminary purpose of positioning the trough during installation, and is capable of fixed engagement with the trough to complete the installation. The contour of the harness member is such as to permit the drain trough, when seated within the harness member, to fit closely against the fascia of a building, as in the usual manner of installing a conventional drain trough on houses of current design. The harness member is of integral monolithic construction specifically contoured in a manner permitting its fabrication by molding or by cutting and milling operations applied to a substantially continuous extruded structure. Said extruded structure may be characterized as having a cross-sectional configuration which is constant along its long axis.

(20) The harness member has a generally L-shaped cross-sectional configuration comprised of a rear panel, and a bottom panel perpendicularly disposed with respect to said rear panel. In a preferred embodiment, an elongated rod (30) of circular cross section is positioned forwardly of the
(4) front edge of said bottom panel, being connected thereto by an extension plate integral with said bottom panel. The rod serves as the rotatable internal member of a hinge assembly. In other embodiments, rods may be used which are separate members unattached to said harness or bracket members.

The support bracket member is also of integral monolithic construction specifically contoured in a manner permitting its fabrication by molding or by the removal of selected portions from a continuous extruded structure. The bracket member has a generally L-shaped cross-sectional configuration comprised of a rear panel and bottom panel, said panels preferably having substantially the same widths as the corresponding panels of the harness member. Associated with the front edge of the bottom panel of said bracket member is a pair of spaced apart coaxially aligned tubular bushings, at least one of which is preferably provided with a slot parallel to the axis of said bushings.

(20) The hinged bracket assembly may be assembled by slideably causing the elongated rod of said harness member to enter said bushings while said extension plate passes through the axially aligned slot of the bushings. After said rod is entered within said bushings, sleeve bearings are preferably fitted onto said rod and anchored within said bushings to prevent subsequent passage of said extension plate through said slot. The hinged bracket assembly is attached to the fascia by fastening means acting in association with the rear panel of said support bracket member.
BRIEF DESCRIPTION OF DRAWINGS

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings forming a part of this specification and in which similar numerals of reference indicate corresponding parts in all the figures of the drawing.

Figure 1 is a perspective view of an embodiment of hinged bracket assembly of the present invention showing a portion of a drain trough positioned in upright mode within said assembly.

Figure 2 is a sectional side view of the hinged bracket assembly taken along the line 2-2 of Figure 1, and showing the drain trough positioned in the inverted mode.

Figure 3 is a top view of the harness member of the hinged bracket assembly of Figure 1.

Figure 4 is a top view of the support bracket member of the hinged bracket assembly of Figure 1.

BEST MODE OF CARRYING OUT THE INVENTION

Referring to Figure 1, a hinged bracket assembly 10 of the present invention is shown holding a conventional drain trough 11, not a part of this invention, said trough being positioned in its upright, functional position adapted to catch water falling from the edge of an overhead roof, not shown. The hinged bracket assembly is comprised of a support bracket 12 hingedly engaged with a harness 13. Support bracket 12, having a generally L-shaped configuration, is comprised of vertical rear panel 14, and horizontal bottom panel 15 perpendicularly
joined to rear panel 14 at the lowermost extremity thereof, the widths of said panels being determined by parallel side edges 38. The forward edge of said bottom panel has (5) attached thereto a pair of spaced apart coaxially disposed circular cylindrical bushings 16 and 17, having facing extremities 36 and outer extremities 37 lying in planes perpendicular to said forward edge. One of said bushings has a slot 18 positioned at an elevation above bottom panel 15 and aligned coextensively with the axis of said bushings. Abutment means in the form of tabs 19 extend downwardly from sites on the exterior of said bushings disposed generally below bottom panel 15 and forward of the axis of said bushings. Holes 20 are symmetrically (10) located in rear panel 14 to facilitate attachment of support bracket 12 to the fascia of a building.

The support bracket 12 illustrated in Figures 1, 2 and 4 is of integral monolithic construction and may be fabricated from a continuous extruded structure by cutting (20) said extruded structure transversely at sites corresponding to the desired width of said bracket, and then removing material from the regions 21 and 18 shown in Figure 4.

Harness 13 is comprised of rear panel 22, and bottom panel 23 which emanates perpendicularly from rear panel 22 at the lowermost extremity thereof. The upper extremity of rear panel 22 is provided with a retaining lip 24 which extends downwardly in the direction of bottom panel 23. Said lip 24 traverses the entire width of rear panel 22 (25) and extends downwardly a distance of between about 1/4 inch
and 1/2 inch. An attachment strip 25 extends perpendicularly upward from the forwardmost edge 26 of bottom panel 23 and traverses the entire width of bottom panel 23.

(5) The height of attachment strip 25 is between about 1/4 inch and 3/4 inch. A hole 27 may be provided in strip 25 to facilitate attachment of said strip to drain trough 11 by rivets 28 or equivalent fastening means. An extension plate 29 protrudes forwardly a distance of between about 1/4 inch to one inch from the forwardmost edge 26 of bottom panel 23. The forwardmost edge 30 of plate 29 supports an elongated rod 31 of circular cross section, the axis of which is disposed parallel to the forwardmost edge 26 of bottom panel 23. The width of plate 29, measured between side edges 35 is substantially equal to the spacing between facing extremities 36 of said bushings. The length of rod 31 corresponds to the width of bottom panel 23. The diameter of rod 31 is such as to make a close fit within cylindrical sleeve bearings 34 confined by bushings 16 and 17. Elongated spaces 32 exist between rod 31 and the forwardmost edge 26 of bottom panel 23 on each side of plate 29, the width of said spaces being at least as great as the radially measured wall thickness of bushings 16 and 17.

(25) The harness 13 and support bracket 12 of the hinged bracket assembly of this invention are preferably fabricated from continuous extruded shapes comprised of metals such as aluminum, magnesium and alloys thereof, or thermoplastic resins such as polypropylene, polyvinylchloride, styrene-acrylonitrile-butadiene copolymers, and equivalents.
thereof. The thickness of the several flat portions such as rear and bottom panels, retaining lip and attachment strip may range from about 1 to 4 millimeters. The (5) diameter of rod 31 may range from about 3 to 15 millimeters.

In assembling the exemplified embodiment of the hinged bracket assembly of the present invention, rod 31 of harness 13 is entered into bushing 17 having slot 18.

(10) Plate 29 is caused to pass through slot 18. The entering movement of harness 13 is continued until plate 29 resides in the space 21 between the bushings. In this position the harness can be pivotably moved 180° about the axis of rod 31, and the edges 35 of plate 29 are in sliding abutment with the facing extremities 36 of said bushings. Sleeve bearings, which may be fabricated of metal, plastic or other suitable materials of low frictional characteristics are placed on rod 31 and immovably anchored within said bushings by means of adhesive or other fastening techniques. The primary purpose of the anchored sleeve bearings is to prevent subsequent passage of the extension plate through the slot.

One extreme of said 180° movement is the seated position shown in Figure 1 wherein the bottom panels of (25) the bracket and harness are in abutment. The opposite extreme of pivoted movement is shown in Figure 2, wherein attachment strip 25 is in abutment with abutment tabs 19 extending downwardly from bushings 16 and 17. The assembled hinged bracket assembly is attached to the fascia of a building by use of nails, screws or equivalent
fastening means acting through rear panel 14 of bracket 12, holes 20 being provided for such purpose. The drain trough may be attached to harness 13 by causing the upper rear edge 33 of said drain trough to fit under retaining lip 24, and then fastening the lower front portion of said trough to attachment strip 25. Said fastening may be achieved by a rivet 28 inserted through hole 27 in attachment strip 25, or by other means. In embodiments having no retaining lip or attachment strip, the trough is attached by rivets, adhesives, soldering or other joining means to the rear and bottom panels of harness 13. In some embodiments, rear panel 22 of said harness may possess sufficient flexibility to facilitate engagement with said trough.

In the normal or water collecting mode, the drain trough will be in upright position seated above bracket 12, as shown in Figure 1. When it is desired to clean or service the drain trough, it is inverted to the position shown in Figure 2 wherein harness 13 has been rotated 180°, and bottom panel 23 is in substantially horizontal position. The inversion may be achieved by means of a long pole manually applied to the trough or by pulley means or other mechanical means adapted to act upon the trough or hinged bracket assembly.

While particular examples of the present invention have been shown and described, it is apparent that changes and modifications may be made therein without departing from the invention in its broadest aspects. The aim of the appended claims, therefore, is to cover all such changes and modifications as fall within the true spirit and scope of the invention.
CLAIMS

1. A hinged bracket assembly for pivotally attaching a drain trough to the fascia of a building beneath the edge of a roof thereof comprising:
   a. a harness member of integral monolithic construction having a generally L-shaped configuration comprised of a flat rear panel having straight parallel uppermost and lowermost edges, a flat bottom panel emanating from the lowermost edge of said rear panel, extending perpendicularly from said rear panel and terminating in a front edge, the widths of said rear and bottom panels being substantially equal, an extension plate emanating from the central portion of the front edge of said bottom panel and extending forwardly therefrom, and an elongated rod of circular cross section associated with said extension plate, the axis of said rod being parallel to the front edge of said bottom panel and the length of said rod being substantially equal to the widths of said rear and bottom panels, and
   b. a bracket member of integral monolithic construction having a generally L-shaped configuration comprised of a flat vertical panel having straight parallel uppermost and lowermost extremities, a flat horizontal panel emanating from the lowermost extremity of said vertical panel, extending perpendicularly from said vertical panel and terminating in a forward edge, said vertical and horizontal
panels being of equal widths between parallel side edges, a pair of spaced apart coaxially disposed circular cylindrical bushings emanating from said forward edge, and having facing and outer extremities, and abutment means emanating from said bushings at sites below said horizontal panel,

c. said harness member being positioned with respect to said bracket member in a manner such that said rod is insertively centered within said bushings, and said extension plate is positioned between the facing extremities of said bushings.

2. The bracket assembly of claim 1 wherein the outer extremities of said bushings are flat and coplanar with the side edges of said vertical and horizontal panels of said bracket member.

3. The bracket assembly of claim 1 wherein the width of the rear panel of said harness member is substantially equal to the width of the vertical panel of said bracket member, and the width of the bottom panel of said harness member is substantially equal to the width of the horizontal panel of said bracket member.

4. The bracket assembly of claim 1 wherein said harness member is derivable from an extruded structure.

5. The bracket assembly of claim 4 wherein said bracket member is derivable from an extruded structure.

6. The bracket assembly of claim 1 wherein a retaining lip emanates from the uppermost edge of said rear panel of said harness member, said lip being angled
(12)

toward the bottom panel of said harness member.

7. The bracket assembly of claim 1 wherein an attachment strip emanates from the front edge of the bottom panel of said harness member, said attachment strip extending upwardly from said bottom panel.

(5)

8. The bracket assembly of claim 1 wherein the facing and outer extremities of said cylindrical bushings are flat and disposed in planes perpendicular to the forward edge of said horizontal panel.

(10)

9. The bracket assembly of claim 1 wherein at least one of said bushings has a slot therein positioned at an elevation above said horizontal panel, aligned co-extensively with the axis of said bushings, and having a width sufficient to permit edgewise passage of said extension plate.

(15)

10. The bracket assembly of claim 1 wherein cylindrical sleeve bearings are immovable held within said bushings and are adapted to rotatably engage said rod.
**INTERNATIONAL SEARCH REPORT**

**Classification of Subject Matter**

According to International Patent Classification (IPC) or to both National Classification and IPC:

- Int. Cl. 8 E05D 5/06; E05D 13/06
- US. Cl. 16-389; 52/11

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Documentation Searched other than Minimum Documentation to the extent that such Documents are Included in the Fields Searched

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- "E" earlier document but published on or after the international filing date
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**Certification**

- Date of Actual Completion of the International Search: 26 March 1982
- Date of Mailing of this International Search Report: 12 April 1982

International Searching Authority: ISA/US

Signature of Authorized Officer: A. M. Falik