Feb. 23, 1960 R. S. MARTIN 2,925,976

ADJUSTABLE EAVES TROUGH SUPPORTS

Filed Nov. 25, 1958

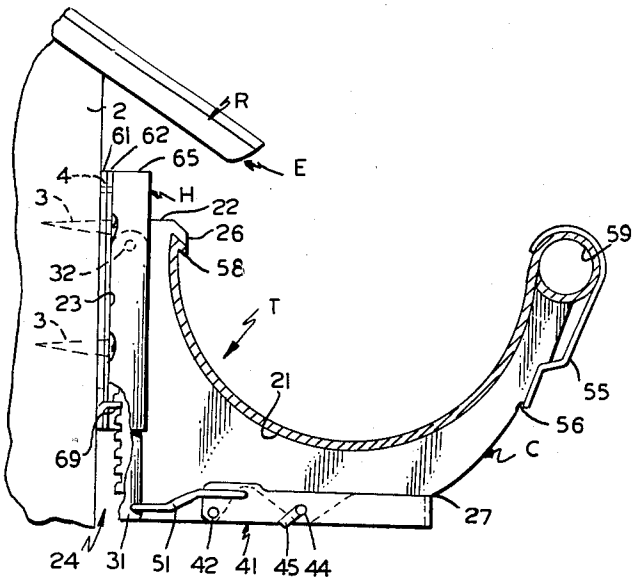



FIG.1

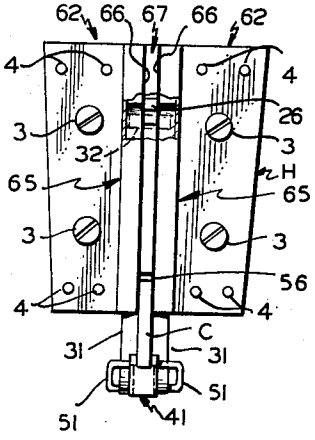



FIG.2

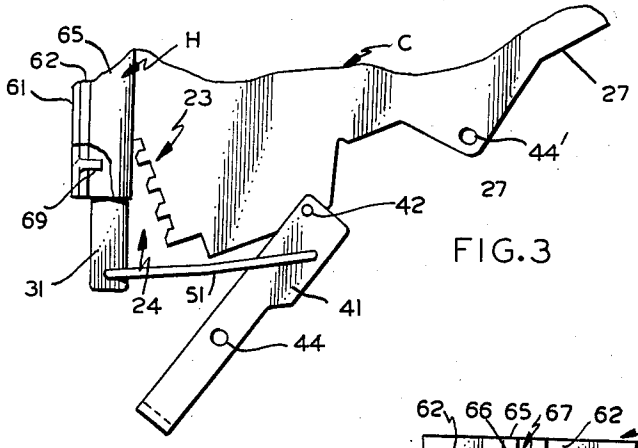



FIG.3

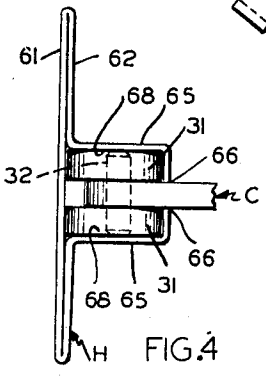



FIG.4

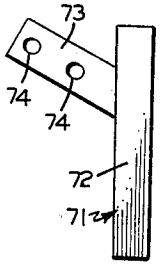



FIG.5

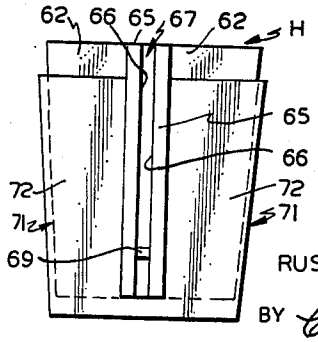



FIG.6

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# ADJUSTABLE EAVES TROUGH SUPPORTS

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6 Claims. (Cl. 248—48.2)

This invention relates to adjustable eaves trough supports; and, more particularly, to such supports having improved characteristics of strength, durability, convenient applicability, ready adjustability, security in retaining adjustments, together with inexpensiveness of manufacture.

It is an important object of this invention to provide a support which may be expeditiously adjusted to establish vertical positionings of an eave trough at any one of a comparatively wide range of heights.

It is a further important object to provide, in such a support, means for very securely maintaining positionings so established, while readily conditionable for permitting such positionings to be revised, should occasion require.

Another object is to provide a support consisting of parts which may be manufactured at minimum expense, as by punching and forming of sheet material, or by using automatic machinery in forming parts of wire.

A still further object is to produce a support of maximum strength and durability, whereby to successfully withstand storm and destructive influences of use, particularly in regions where the support is likely to be subjected to impact of bodies of snow and ice when sliding off from the associated roof.

Another object is to provide a support comprising a holder of such form that it may be readily and quickly applied to a building adjacent to the edge of the roof, together with a trough engaging plate or so-called "circle" which can be readily associaed with and vertically adjusted relative to such holder, and thereupon securely locked in any one of a comparatively wide range of adjusted positionings.

Still other objects of this invention will in part be obvious, and, in part, will be referred to in the ensuing description of the exemplification of this invention which is shown by the accompanying drawing, in which

Figure 1 is a side elevation of a support embodying this invention, as applied to a building, and showing, in section, the edge of an eave trough supported thereby:

Fig. 2 is a partial outer edge elevation of the support of Fig. 1, with portions of certain parts broken away;

Fig. 3 is an enlarged fragmentary view of the support of Figs. 1 and 2, with portions thereof broken away for showing positionings of parts for permitting revision of the adjustment of the heighth of the trough;

Fig. 4 is an enlarged plan view showing the upper edges of the holder, with an associated fragment of the "circle" element;

Fig. 5 is a side view of a bracket, suited for fastening to the side of a rafter or other building portion, and carrying a face plate such as shown in Fig. 6; and

Fig. 6 shows the holder of Fig. 2 mounted in the face plate of the attaching bracket of Fig. 5.

Referring to the embodiment of this invention which is shown in the drawing, the plate-like so-called "circle" element C has a semi-circular channel **21** formed in the upper edge **22**, thereof; said channel being of form suited



for supportingly receiving a trough of desired form, such as the trough T, an end view of which is here shown in cross-section.

The left hand vertical edge **23** of the circle C is disposed at substantially right angles to the plane in which are disposed the upper edges of the channel **21**. Said edge **23** has serrations **24** formed therein, for a purpose which will be presently explained in greater detail.

A downwardly inclined hook **26** is formed in the upper left-hand portion of the circle C, for engaging the inner edge **58** of the trough T, and bars **31, 31** are situated at respective sides of said circle.

A pivot **32** passes through the upper ends of the bars **31, 31**, and through the circle C near the junction of the edges **22** and **23** thereof.

A locking lever **41** is attached to the lower portion of the circle C by a pivot pin **42**, said locking lever being of U-form, and the sides thereof extend along respective sides of the circle C, and the right-hand end of said lever forms an inter-connection between the sides thereof. The upper edge of said interconnection rests against the lower edge **27** of the circle C when said lever is in its normal locking position.

An opening **44** is provided through the locking lever **41** between the free end thereof and its pivot pin **42**, and a corresponding opening **44'** (shown in Fig. 3) is provided in the lower portion of the circle C and is so positioned as to be in alignment with the opening **44** when said lever is in its locking position.

If desired, a pin or a wire **45** may be inserted through these openings for retaining said lever against unintended displacement from its locking position. The ends of a wire so used may be bent over, as suggested in Fig. 1, so as to retain it in position.

A holder H comprises a rear portion **61** and front portions **62, 62**; said front portions comprising wings **65, 65**, the opposing edges **66, 66** of which wings being spaced apart to provide an opening **67** therebetween, for receiving the serated edge **23** of the circle C; the portions of said wings adjacent said edges being spaced from said rear portion **61** to provide the channels **68, 68** for receiving the bars **31, 31**, as best shown in Fig. 4.

Said front portions **62, 62** of the holder H may be formed by bending over parts of the rear portion or plate **61** to provide the vertical edges of said holder (as indicated in Fig. 4), or said front portions may be formed separately from said rear portion **61** and secured thereto, as by the rivets **4** indicated in Figs. 1 and 2. The sidewalls of the holder H are shown in Fig. 2 as converging downwardly, for a purpose which will be hereinafter more fully explained.

A tooth-like projection **69** (best shown in Figs. 1 and 3) is carried by the rear portion **61** of the holder H, and is so formed and positioned that it may be engaged by the serrations **24** when the edge **23** of the circle C is positioned in the opening **67**.

Said projection **69** is preferably formed integral with the rear portion **61** of said holder H, as by having the protruding edge thereof moved out of the plane of said rear portion **61** by stamping or otherwise or said projection might be a separate piece riveted or otherwise secured to said rear portion **61**.

A resilient link **51** connects the lower ends of the bars **31, 31** with the lever **41** in a manner such that, when the element C is positioned in the holder H, clockwise movement of said lever, from its extreme right-hand or locking position, will cause said element to move its serrated edge **24** away from the projection **69**, and such that when said lever is in its said locking position with the upper edge of the end portion thereof resting against the lower edge **27** of said circle, the serrated edge **24** will be pressed against the projection **69** and the then

pull of said link (resultant from its resiliency, and that of the holder H and other parts) will have over-center application to said lever, thereby tending to restrain it against displacement from its locking position.

A spring clip **55** is shown as being applied over the outer rolled or beaded edge **59** of the trough T, and the lower end of said clip is retained in a notch **56** provided therefor in the right-hand edge of the circle C.

The holder H may be attached to a building, as by the use of the nails **3, 3**, as indicated in Fig. 1. If desired, screws or drive screws may be utilized in place of the said nails.

When it is desired to attach supports embodying this invention to buildings having structural characteristics which do not facilitate attachment of the holders H in the manner indicated in Fig. 1, such holders may be attached by the use of fixtures such, for example, as the bracket fixture shown in Figs. 5 and 6; which fixture comprises a face plate **71** and guide or runway wings **72, 72**, within which the holder H may be supported.

In Fig. 5 a strap **73** is shown in association with and extending rearwardly from said face plate **71** at an angle such that, when said strap has been applied to the side of the intended rafter, and secured thereto by nails driven through openings **74, 74** therein, the face plate will be positioned for supporting a holder in suitable relationship to the edge of the associated roof. It will be noted that the side walls of the face plate **71** converge downwardly so that a holder having side walls similarly converging, as shown in Fig. 2, will be suitably supported therein.

In using the embodiment of this invention shown by the drawing and herein described in detail, holders H should be attached to the building in suitable relationship to the edge of the roof, as in the manner indicated in Fig. 1, or by the use of suitable fixtures such, for example, as that suggested by Figs. 5 and 6.

Into the opening **67** of each such holder, the upper end of the serrated edge **24** of a desired one of the circles C should be inserted, and the upper ends of the bars **31, 31**, carried by such circle, should be introduced into the lower ends of the channels **68, 68**, while the locking lever **41** is hanging freely pendant.

The circle C should then be positioned at or about the desired height, and so that one of the depressions in its serrations **24** is receiving the projection **69**; whereupon the lever **41** should be moved to its right-hand or locking position; thereby acting through the link **51** and the bars **31, 31** to press and retain said serrated edge **24** against said projection **69**.

The trough T may then be placed upon the circles, so that its inner edge **58** is under their hooks **26**; and spring clips **55** should then be applied over the outer edge **59** of the trough T, and the lower end of each clip caught in the notch **56** formed in its associated circle.

Thereupon, the locking levers **41**, of all but the circle at one end or the other of the trough, may be swung downwardly, and the various circles so positioned that a desired uniform slant or pitch will be established for the entire length of the trough; each lever **41** being thereafter moved to its right-hand or locking position when its associated circle is at the desired height.

The locking levers may be further secured in their locking positions by passing wires or pins through the openings **44** in these levers and through the corresponding openings **44'** near the lower edge of the associated circles C in alignment therewith. Ends of such wires or pins may then be bent downwardly, as indicated by the wire **45** as shown in Fig. 1, for retaining them against falling out.

Should it be desired to subsequently revise the height positioning of any circle C, this can readily be accomplished after swinging its locking lever **41** downwardly; and when the desired new positioning has then been obtained, the circle can be secured in such new position in the manner already described.

Should the trough T tend to bulge upwardly away from any circle, after such circle has been set at the desired height, the trough may nevertheless be held snugly against such circle by its hook **26** in cooperation with its spring clip **55**; which, respectively, engage the inner and outer edges **58** and **59** of such trough T. Furthermore, any such tendency will not cause any of the circles C to be lifted above their intended settings, because the manner of the engagement of the serrations **24** with the projection **69** is such as to resist upward as well as downward movement of the associated circles.

The importance of preventing the trough T from bulging upwardly arises from the fact that any such bulging is likely to cause formation of a pocket in the trough, such as would be likely to prevent water properly draining therefrom.

From the foregoing it will be evident that eaves trough supports embodying this invention may be very economically manufactured, and that this invention provides a very simple support which (aside from a few rivets, two pivot pins, a wire link and a wire clip, all of which may be inexpensively produced by automatic wire forming machines) consists merely of a circle element and a holder which may be pressed from sheet stock, and two bars which may be cut from rod stock. Furthermore, the production of such eaves trough supports does not require assembling procedure other than attaching the bars and the locking lever to the circle element by means of their pivot pins and applying the link to the locking lever and snapping its free ends into the holes provided in the lower ends of the bar **31, 31**.

While an illustrative embodiment of this invention is shown in the accompanying drawings and hereinbefore described in detail, it should be clearly understood that this invention is not limited to the exact construction illustrated and described, because various modifications in these details, changes in the size, shape, and arrangement of parts may be made, and certain of the parts shown may be advantageously utilized without others thereof, within the scope of this invention as defined by the annexed claims.

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

1. An eaves trough support comprising, in combination, a circle-element having an edge thereof formed for supporting a trough of desired form, an adjoining edge of said element having serrations formed therein, a bar having an end thereof pivotally attached to one side of said element adjacent the junction of aforesaid edges thereof, a locking lever pivotally attached to said element, means operatively connecting said lever to said bar, a holder having an opening therein for receiving said serrated edge of said element and having a portion thereof formed to provide a channel for receiving and permitting longitudinal movements of said bar therethrough, and a tooth-like projection carried by said holder for engagement by the serrated edge of said element when it is in the opening in said holder provided therefor.

2. An eaves trough support in accordance with claim 1 in which the means operatively connecting the lever with the bar comprises a resilient link.

3. An eaves trough support comprising, in combination, a circle-element having an edge thereof formed for supportingly receiving a trough of desired form, means involving the formation of said element for assuring retention of a desired trough of intended form in snug engagement with said edge, said element having serrations formed along another edge thereof and disposed in suitable relation to said first named edge thereof, a bar extending along one side of said element and substantially parallel with said serrated edge thereof, a pivotal attachment securing an end of said bar to said element adjacent to the junction of aforesaid edges thereof, a locking lever

pivotally attached to said element, a link operatively connecting said lever to the free end of said bar, a holder of form suited for receiving therein the serrated edge of said element and having a portion thereof formed to provide a channel for receiving and permitting longitudinal movements of said bar therethrough, said holder comprising a tooth-like projection suited for engagement by the serrated edge of said element when it is received in said holder.

4. An eaves trough support comprising, in combination, a plate-like circle-element having a semi-circular channel formed in an edge thereof, which channel is suited for supportingly receiving a trough of desired form, another edge of said element extending in suitable relation to said first named edge and having serrations formed along at least a portion of the length thereof, said element further comprising a hook for engaging one of the edges of such trough as may be associated therewith, a bar situated at one side of said element and extending substantially parallel to and adjacent to said serrated edge thereof, an end of said bar being pivotally attached to said element near the junction of the aforesaid edges thereof, a locking lever pivotally attached to said element near the edge thereof opposite said first-named edge, a resilient link operatively connecting said lever to the free end of said bar, and a holder for supporting said element, said holder of form suiting it for attachment to a building adjacent its eaves, said holder having an opening therein for receiving said serrated edge of said element and comprising a wing so formed as to provide a channel for receiving and permitting longitudinal movements of said bar therethrough, said holder also comprising a tooth-like projection extending in the direction of said opening for engagement by said serrations when the second-named edge of said element is in said opening.

5. An eaves trough support comprising, in combination, a circle-element having an edge thereof formed for supporting a trough of desired form, another edge of said element having serrations formed therein, bars situated at respective sides of said element and disposed adjacent to said serrated edge thereof, each of said bars having an end thereof pivotally attached to said element near the junction of aforesaid edges thereof, a locking lever pivotally attached to said element, a resilient link operatively connecting said lever to said bars, a holder for supporting said element, said holder comprising wings, the opposing edges of said wings being spaced to provide an opening for receiving the serrated edge of said element therebetween, said wings further being formed and relatively



positioned so as to provide channels for receiving and permitting longitudinal movements of said bars, respectively, therethrough, and a tooth-like projection carried by said holder for engagement by the serrated edge of said element when said edge is situated between the edges of said wings, and said bars are in said channels.

6. An eaves trough support comprising, in combination, a circle-element having an edge thereof formed for supporting a trough of desired form, another edge of said element having serrations formed therein, a bar having an end thereof pivotally attached to one side of said element adjacent the junction of aforesaid edges thereof, a holder having an opening therein for receiving said serrated edge of said element and having a portion thereof formed to provide a channel for receiving and permitting longitudinal movements of said bar therethrough, a tooth-like projection carried by said holder for engagement by the serrated edge of said element when it is in the opening in said holder provided therefore, a locking lever pivotally attached to said element, and a resilient link operatively connecting said lever to the free end of said bar, formation and relative positionings of said bar, said holder, said lever and said link, such that movements of said lever will be so transmitted to said bar by said link that, when said lever is in or adjacent a certain position, said bar will co-act with said holder to urge said element to move its serrated edge into engagement with said projection, and such, that when said lever is in a certain other position, such co-action will urge said element to move its serrated edge away from said projection, relative formation and positioning of said lever and said element further such that movement of said lever, in the direction away from its second named position, will be arrested at a stage thereof appreciably beyond its said first named position, thereby to provide an over-center action for resisting lever displacement from its said arrested stage towards its aforesaid first position.

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