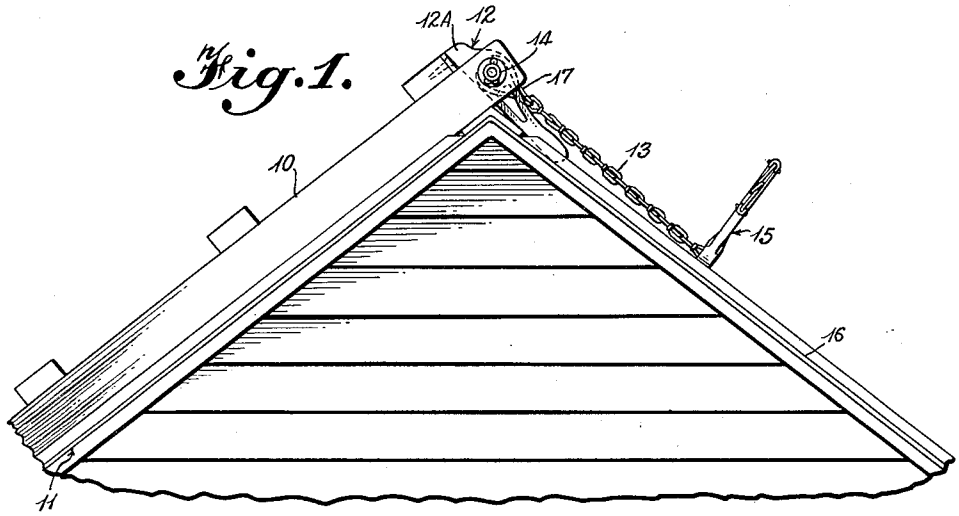
Sept. 12, 1961 B. F. GILES 2,999,290

CLAMPING DEVICE

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Fig. 1.



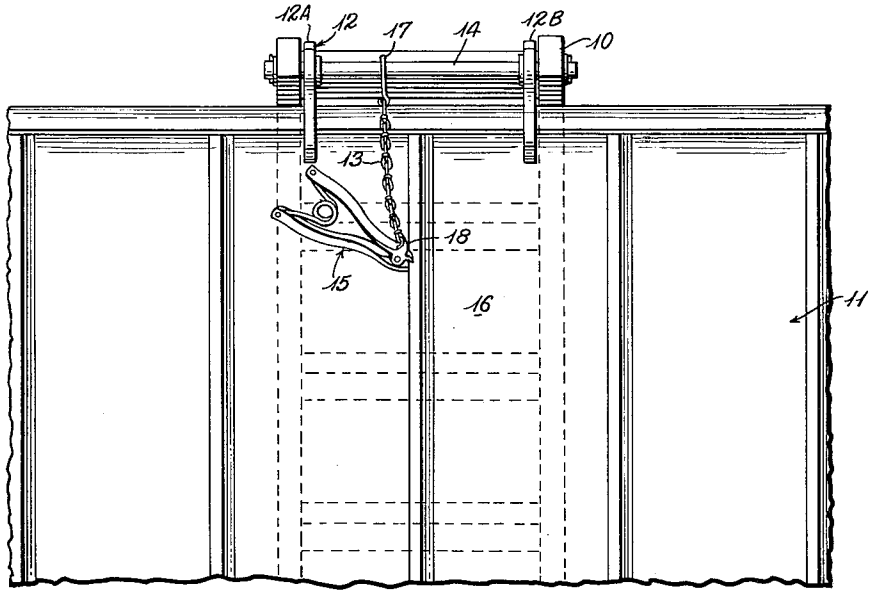


Fig. 2.

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Fig. 5.

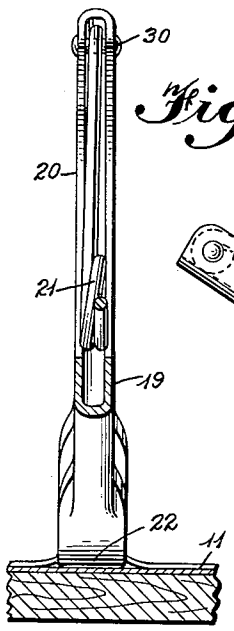


Fig. 3.

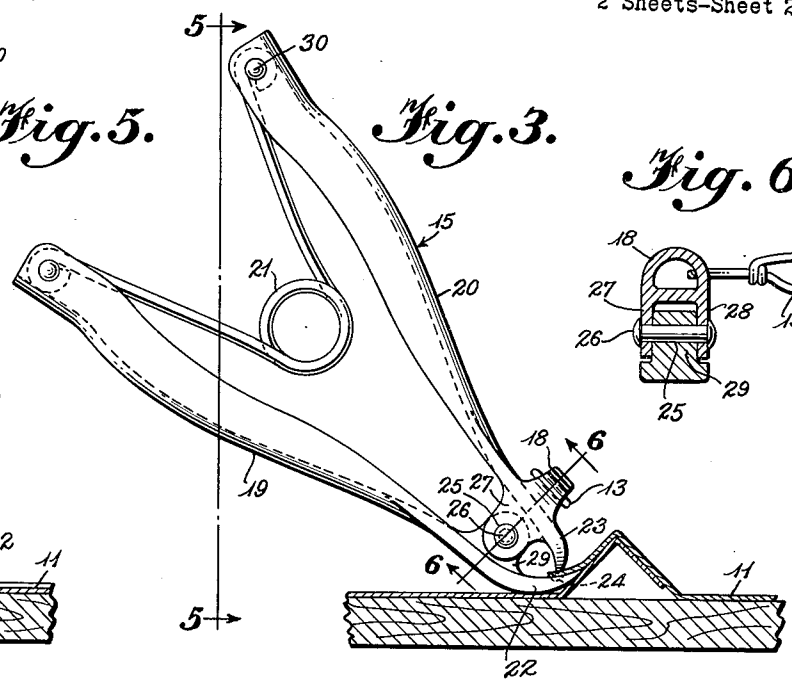


Fig. 6.

Fig. 4.

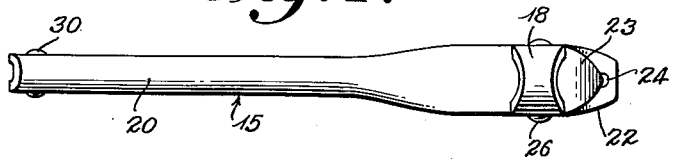


Fig. 7.

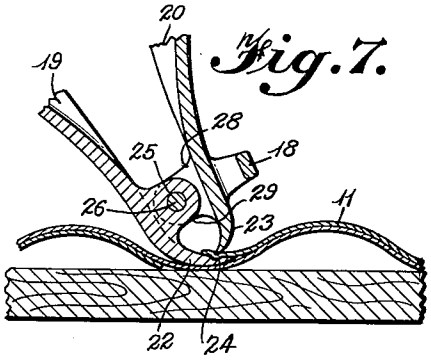
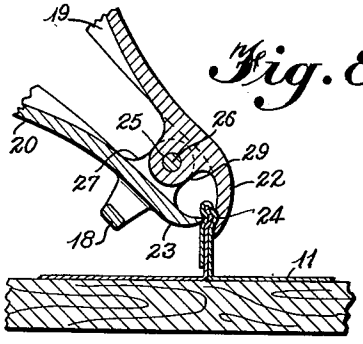


Fig. 8.



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United States Patent Office 2,999,290
Patented Sept. 12, 1961

2,999,290

CLAMPING DEVICE

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Filed July 9, 1957, Ser. No. 670,701
2 Claims. (Cl. 24—252)

This invention relates to an improved clamping device and pertains particularly to a clamping device secured to a ladder for application to a metal roof.

It is well known that it is extremely hazardous to place a ladder on a peaked roof without providing some means for attaching the ladder to the roof. Oftentimes, to decrease the propensity of the ladder to slip or slide off the roof, the ladder is covered on its underside with friction material. Another means incldes the use of one or more claws which are attached to one end of the ladder and fit over the apex or the uppermost portion of the roof. It has been found that the use of friction material is not adequate since it prevents the operator from moving the ladder longitudinally on the roof, since the friction material prevents the sliding of the ladder to a new position. On the other hand, the use of a claw is not satisfactory since as the operator moves about the ladder, the ladder has a tendency to rear upwardly, particularly when the operator is standing near or on the lowest rung.

In order to securely attach the ladder to a roof, this invention contemplates the use of a novel clamp. This clamp is attached by a chain or other flexible means to the upper portion of a ladder. The clamping device has a unique jaw arrangement which permits the clamp to be secured to protruding portions of metal roofs.

It is, therefore, an object of this invention to provide a clamping device which may be clamped to protrusions of peaked roofs.

It is another object of the invention to provide a combination of a ladder with a flexible means attached to a clamping device which may be securely mounted to protrusions on peaked roofs.

It is still another object of the invention to provide a clamping device which has a unique jaw arrangement for clamping to the protrusions on metal roofs.

It is yet another object of this invention to provide a clamping device which is easily attached and removed from protrusions on peaked metal roofs.

Additional objects and advantages of the present invention will become apparent from a detailed consideration of the following description.

In order to more fully understand the invention, the following drawings are provided wherein like symbols refer to like or corresponding parts throughout the several views.

FIGURE 1 illustrates a side elevation wherein a ladder is securely mounted by the clamping device of this invention.

FIGURE 2 is the view as seen from the right side of FIGURE 1.

FIGURE 3 illustrates the clamping device in a clamping relationship.

FIGURE 4 is a top view of the clamping device.

FIGURE 5 is a cross-sectional view taken along lines 5—5 of FIGURE 3.

FIGURE 6 is a cross-sectional view taken along lines 6—6 of FIGURE 3.

FIGURE 7 is a cross-sectional view of the jaw arrangement.

FIGURE 8 is another cross-sectional view of the jaw arrangement.

Now turning to the drawings:

In FIGURE 1 reference numeral **10** refers to a ladder in position on one side of roof **11**. In order to provide means to hold the ladder in place, claw arrangement **12** is provided. The ladder is provided with a chain **13**, one end being attached to pipe **14** which is mounted parallel to the rungs and near the upper portion of the ladder. The claw arrangement **12** is pivotally secured to pipe **14**. The clamping device **15** is attached to the other end of the chain. It is seen from FIGURE 1 that the clamping device is attached to the other side of the roof **11** in clamping relationship with a protrusion on side **16**.

FIGURE 2 illustrates the claw arrangement **12**. It is seen that the claw arrangement **12** consists of two claws, **12A** and **12B**. These claws are rotatably mounted on pipe **14** which runs parallel and which is above the uppermost rung of the ladder. The ends of the claws **12A** and **12B** are positioned so that they lie on side **16** of the roof. The claws are restrained from rotating by the uppermost rung of the ladder. FIGURE 2 shows a ring-like means **17** which is slidably mounted on pipe **14**. Chain **13** is secured to said ring-like means **17**, and as was said in the above, the other end of the chain is secured to aperture lug **18** on said clamping device **15**.

FIGURE 3 shows a clamping device in detail. The clamping device consists of two arms **19** and **20**. The arms are spread apart by biasing means **21**. The jaw arrangement has a beveled flat portion **22** and a pointed portion **23**. The portion **22** terminates in a beveled edge so that the clamping device can be attached to a metal roof by inserting the beveled end of portion **22** beneath a roof seam as shown in FIGURE 7 of the drawing. Flat portion **22** has a small indentation **24** in its concave face and spaced from its beveled edge. It will be appreciated that the pointed jaw is positioned to fit into the indentation. The clamping device is pivoted at **25** by means of a bolt **26**.

FIGURE 6 illustrates the pivoting means in greater detail. The lower portion of the clamping device **20** has a protrusion on one side thereof near the jaw arrangement. This protrusion is bifurcated to provide sides **27** and **28**. The other portion of the clamping device **19** has an ear **29** which is of a suitable dimension to slip between bifurcated portions **27** and **28**. Bolt means **26** is mounted through suitable holes in portions **27** and **28** and through ear **29** in order to complete the pivoting means.

FIGURE 4 illustrates a top view of the clamping device. From FIGURE 4 the view arrangement can be seen. Particularly, it will be appreciated that pointed jaw **23** fits into indentation **24** of jaw **22**.

FIGURE 5 is a cross section of the clamping device which illustrates the mounting means **30** for securing the resilient means **21** to the end portion of side **20** of the clamping device.

FIGURE 7 illustrates the use of clamping device for clamping under a seam of a metal corrugated roof. It is seen that lower jaw **22** slides underneath the seam while pointed jaw **23** actually makes an indentation in the metal seam to render a secure mounting.

FIGURE 8 illustrates the clamping device on another type of metal roof. It is seen therefrom that the folded seam is vertically disposed. The clamping device is merely clamped to the upper portion of said seam.

The above detailed description of the clamping device of this invention has illustrated a preferred embodiment. It is naturally expected that a number of modifications may be made. In connection therewith it is pointed out that resilient means **21** may be of any spring-like material. The spring may be of the type illustrated or may be an outwardly extending helical spring or of any type of spring usually employed in spreading the arms of plier-like arrangements.

The clamping device of this invention may be constructed of any suitable strong metal such as steel or iron and alloys thereof. It will be appreciated that the pivoting means may be reversed so that the bifurcated portion

may be part of side **19** of the clamping device. It is also pointed out that aperture lug **18** may be attached to almost any portion of the clamping device, rather than at the position illustrated. However, the position of aperture lug **18** in the preferred embodiment herein illustrated has proven to be excellent since it is closely allied with the jaw arrangement, thus giving a good hold. The preferred embodiment of the position of the apertured lug is set forth in FIGURES 3 and 6. There, the apertured lug **18** is positioned between arm **20** and pointed jaw member **23** so that the two legs **27**, **28** of the aperture lug are joined, one on each side of arm **20**, at the point of pivotal connection **25** to arm **19**.

The clamping device of this invention can be used on any one of the three metal roofs usually found. In other words, it may be used as in FIGURE 3 where the seam is peaked at a 45° angle; or as in FIGURE 7 where the metal roof is a corrugated roof; or as in FIGURE 8 where the seam is folded and vertically disposed to the roof.

Of particular significance is the fact that jaw **22** is beveled along one end portion. It has been found that the bevelling permits the jaw **22** to be inserted below or underneath the seam portions of the roof.

In order to use the device of the instant invention, the ladder is placed on a peaked roof in the usual manner. The claw arrangement is employed in order to facilitate a preliminary securing of the ladder to the roof. Following this, the user of the ladder climbs the ladder to a point at which the clamping device can be reached and secured to the other side of the roof in a manner as heretofore described. It will be appreciated that by virtue of the fact that the clamping device is flexibly attached through slidable means, the clamping device may be moved with a great deal of freedom.

It will be apparent that many changes and modifications of the several features of the clamping device described herein may be made without departing from the spirit and scope of the invention. It is, therefore, to be understood that the foregoing description is by way of illustration of the invention rather than limitation upon the invention.

What is claimed is:

1. A heavy duty clamping device for securing a ladder on a metal roof comprising two elongated arms, means pivotally interconnecting said arms adjacent one end thereof to define a pair of long portions which act as handles and first and second short arcuate portions which continuously curve inwardly toward each other and act as beak-like interlocking jaw members to grip the marginal edges of closely overlapping sections of the metal roof, the first of said jaw members being wide and terminating in a flat beveled edge for slipping underneath the marginal edges of closely overlapping portions of the metal roof, said first jaw member having a concave face and a circular indentation defined therein spaced from said flat beveled edge and centrally spaced within the width of said first jaw member, said second jaw member being wide and tapering to a single point, said point of said second jaw member being received in the indentation defined in said first jaw member when said jaw members engage, said first jaw member extending beyond the point of engagement with said second jaw member as a flat beveled edge for raising a marginal edge of closely overlapping portions of the metal roof, and resilient means to bias said pair of long portions apart to force said short portions into said beak-like arrangement.

2. A ladder attaching device for supporting a workman on a slant metal roof comprising a heavy duty clamping device for securing said ladder on the metal roof, said clamping device having first and second elongated arms, means pivotally interconnecting said arms adjacent one end thereof to define a pair of long portions which act as handles and first and second short arcuate portions which continuously curve inwardly toward each other and act as beak-like interlocking jaw members to grip the marginal edges of closely overlapping sections of the metal roof, the first of said jaw members being wide and terminating in a flat beveled edge for slipping underneath the marginal edges of closely overlapping portions of the metal roof, said first jaw member having a concave face and a circular indentation defined therein spaced from said flat beveled edge and centrally spaced within the width of said first jaw member, said second jaw member being wide and tapering to a single point, said point of said second jaw member being received in the indentation defined in said first jaw member when said jaw members engage, said first jaw member extending beyond the point of engagement with said second jaw member as a flat beveled edge for raising a marginal edge of closely overlapping portions of the metal roof, and resilient means to bias said pair of long portions apart to force said short portions into said beak-like arrangement, and a fixed apertured lug, positioned on said second elongated arm between the long handle portion and the short arcuate portion thereof so that the two legs of said apertured lug are joined one on each side of said second elongated arm at the point of pivotal connection to said first elongated arm, and means secured to said apertured lug and adapted to attach said clamping device and said ladder.

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