June 6, 1972 H. R. COOPER 3,667,786

FLOOR JOIST STABILIZER

Filed April 27, 1970

Fig. 1

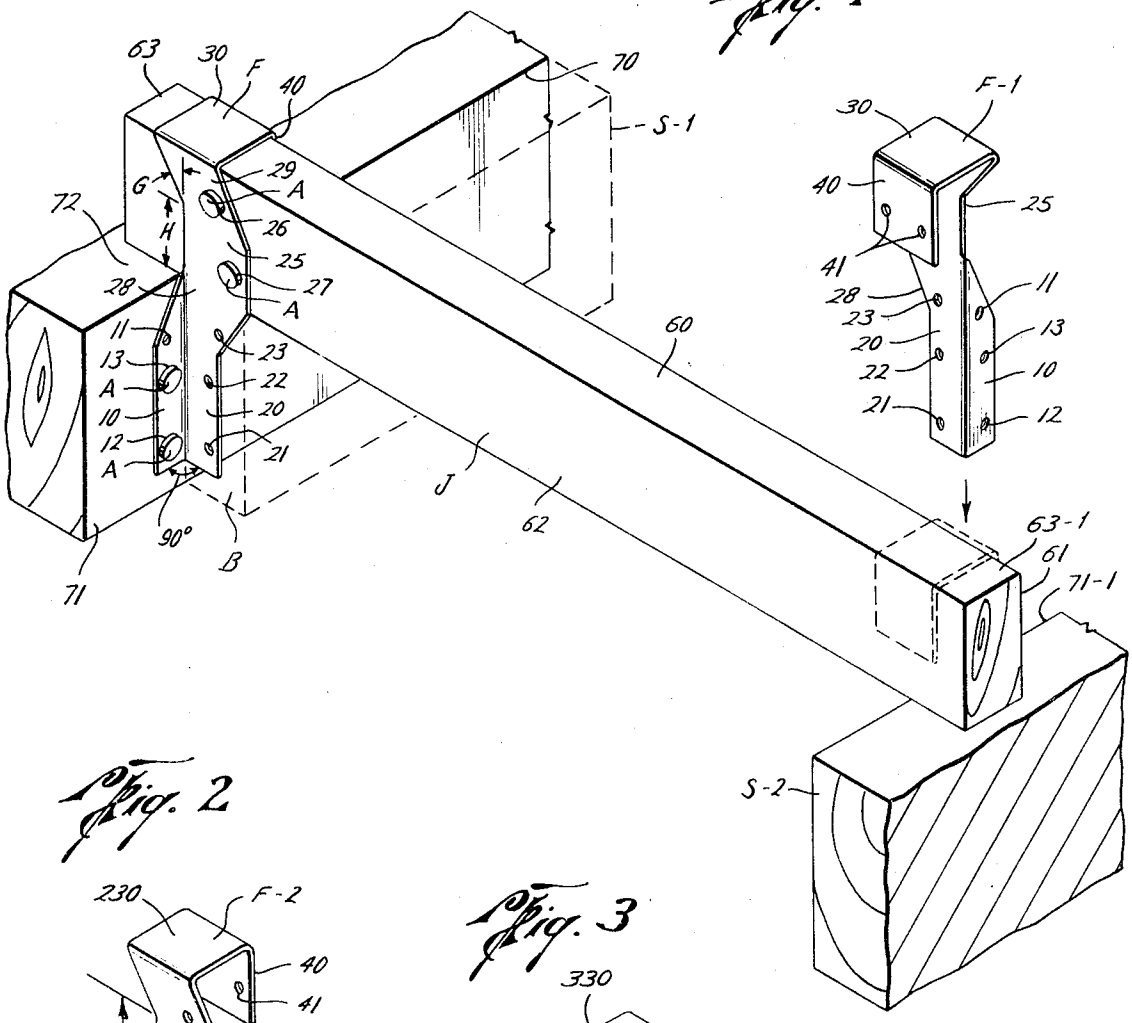


Fig. 2

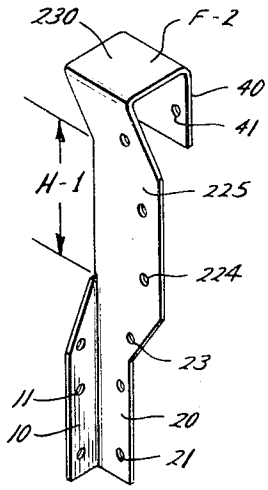
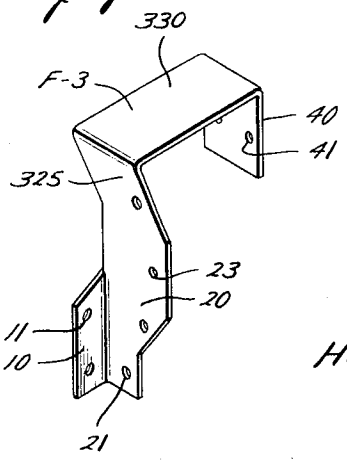


Fig. 3



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FLOOR JOIST STABILIZER

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ABSTRACT OF THE DISCLOSURE

A floor joist stabilizer for affixing a joist to a sill upon which mobile homes and the like are situated to establish a simple strong connection therebetween, preventing twisting movement of the joist with respect to the sill and allowing re-use of the stabilizer. The stabilizer is self-positioning on the joist and therefore does not require hammering or any modification in the field by the user.

BACKGROUND

The present invention relates to the field of floor joist stabilizers.

It was known in the prior art to situate mobile homes semi-permanently (that is, dismounted from the trailer) upon a foundation of two longitudinal wooden rail members, called sills, which were of large cross-section lumber, usually 4 inches x 4 inches or larger. Placed transversely to the two sills and spaced along their length were a plurality of lumber floor joists to provide further support for the mobile home.

So far as is known, the two prior methods of affixing the joists to the sills were toenailing and bolting. Toenailing was accomplished in the usual manner by situating the joist in the proper position on the sill and driving nails into the joist at an angle of approximately 45 degrees from the horizontal through the joist into the sill. Toenailing often did not establish a sufficiently strong connection, because the nails driven in tended to splinter and fracture the ends of the joists, also making it difficult to re-use the joists in another mobile home foundation. Further, the connection formed by toenailing was not sufficiently strong against twisting forces tending to move the ends of the joists along the sills.

The bolting method was accomplished by positioning the joist on the sill, drilling a vertical hole through both the joist and the sill, inserting a bolt through such hole, and attaching washers and nuts to the two threaded ends of such bolts. The nut required beneath the sill in the bolting method was difficult to attach as that end of the bolt was difficult to reach. Also the bolting method required special assembly techniques and tools on location in order to drill the hole in the joist and sill. Also, there was often insufficient contact between the metal bolt and the wooden joist and sill, and thus, the strength of the connection formed was not satisfactory under severe stress conditions. Also, the holes drilled in the joist and sill weakened such joists and sills and limited their re-use.

SUMMARY OF THE INVENTION

With the present invention, a new and improved self-positioning floor joist stabilizer is provided to firmly affix a floor joist to a sill in the foundation of a mobile home without requiring special assembly tools or techniques and also to resist forces tending to move the joist along the upper surface of the sill, yet allowing disassembly and re-use of the sill, joist and stabilizer. The stabilizer can be easily fabricated from a single piece of metal which has essentially an angle iron and a channel member joined in a special relationship. Because the forces involved may be considerable for holding large

joists for mobile homes in position, the metal must inherently be relatively heavy to withstand such forces, thereby making adjustments by hammering the metal to shape in the field difficult, if not impossible.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates two joist stabilizers according to the present invention, one in position affixing a sill and one end of a joist to form a connection and the other removed from another sill and the other end of the joist to illustrate how the joist stabilizer attaches to the joist and sill;

FIG. 2 illustrates a modified joist stabilizer of the present invention, adapted for use with a different size joist than that of FIG. 1; and

FIG. 3 shows another modified joist stabilizer of the present invention, adapted for use with still another size joist.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 of the drawings, a connection established according to the present invention is illustrated consisting of a sill member S, a joist member J, a stabilizer F, and a plurality of affixing means A which join the stabilizer F to the joist J and sill S.

The sill S will be normally fabricated from treated lumber having a large cross section such as four inches by four inches, or larger, and will be disposed either atop bricks, or directly on the ground, for location longitudinally beneath the mobile home. An additional sill member S–1 may be longitudinally affixed to the sill S along a common surface **70** should one sill S not be sufficiently long to support the mobile home. A second sill member S–2 will be longitudinally disposed similarly to the sill S and laterally displaced therefrom so that the sills S and S–2 are disposed longitudinally beneath the mobile home, serving as the foundation for the mobile home.

The joist member J is situated atop the sills S and S–2 in a direction transverse to that of the sills. A plurality of other joist members (not depicted) will be disposed laterally at longitudinally spaced points along sill members S and S–2 to provide further foundation support for the mobile home.

The stabilizer means F of the present invention, made of thin gauge steel or other suitable material, has a first flange **10**, a second flange **28**, a third flange **30**, and a fourth flange **40**. The second flange **28** includes a lower flange section **20** and an upper flange section **25**.

The first flange **10** engages a vertical longitudinal surface **71** of sill member S. A plurality of holes or apertures **11**, **12** and **13**, are formed in the flange **10**, through which suitable affixing means A, for example nails or screws, are passed so as to engage and hold flange **10** against the surface **71** of the sill member S.

The lower flange section **20** forms a right angle in conjunction with the flange **10** and therefore, together, they correspond to a standard angle iron. A plurality of holes or apertures **21**, **22** and **23** are formed through the flange section **20** so that suitable affixing means can be passed therethrough in order to engage the lower flange **20** against a butt end B of the additional sill member S–1, if such additional sill member S–1 is required. The upper flange section **25** is a vertical extension of the lower flange section **20** for a distance H above a horizontal longitudinal surface **72** of sill S on which joist J is situated to thereby provide for a self-positioning of the flange **30** on the upper surface of the joist J. In other words, the stabilizer F may be readily mounted on the joist J with all surfaces in the proper position without any hammering, bending or other alteration of the stabilizer F, even

though the vertical height of the joists J may vary within the limits of the distance H. The upper flange section **25** has a plurality of holes or apertures **26** and **27** therein for receiving suitable affixing means A therethrough to engage and hold the upper flange; section **25** of the stabilizer F against a vertical transverse surface **62** of the joist member J.

A topmost portion **29** of the upper flange section **25** beginning at the distance H above the surface **72** of sill S has been displaced at an angle G from the vertical in order for the third flange **30** to be situated atop an end portion **63** of joist J substantially directly above the sill member S, so that the stabilizer F, by means of the flange **30** riding on end portion **63** of horizontal surface **60** of joist J imposes a substantially vertical force in a direction compelling joist J against sill S. In some situations, the topmost portion **29** is not displaced by the angle G, but instead, extends vertically from the lower flange section **20** along with the remainder of upper flange section **25**. Such modified structure is not as stable as that illustrated, but is often acceptable.

The fourth flange **40** extends vertically downwardly from the horizontal flange **30** and engages a second transverse surface **61** of joist J and has a plurality of holes or apertures (shown at **41** and **42**) therein for the passage of suitable affixing means A, such as nails or screws, to attach such flange **40** to the surface **61** of the joist J.

The upper portion **25** of the second flange **28**, together with the third flange **30** and fourth flange **40**, from a "U"-shaped channel member passing about the surfaces **62**, **60** and **61**, respectively, of the joist member J.

At the other end of joist J, a stabilizer F–**1** is shown in a position before it is attached to the joist J and a second sill member S–**2** to form the connection. When a connection is formed, the stabilizer F–**1** is situated on joist J so that the first flange **10** of such stabilizer F–**1** engages the vertical longitudinal surface **71**–**1** of the second sill member S–**2** on the side of joist J opposite the side of joist J on which flange **10** of stabilizer F is situated. The fourth flange **40** of stabilizer F–**1** is affixed by suitable affixing means (not shown) through apertures **41** and **42** to the vertical surface **62** of joist J engaged by the upper flange portion **25** of stabilizer F, and the upper flange portion **25** of stabilizer F–**1** is affixed to the vertical surface **61** of joist J engaged by the fourth flange **40** of stabilizer F. The third flange **30** engages end portion **63**–**1** of the horizontal surface **60** of joist J imposing a vertical force compelling joist J against second sill member S–**2**.

Situating stabilizers F and F–**1** in this manner so that the upper portions **25** of their second flange surfaces **28** engage opposite vertical transverse surfaces **61** and **62** of joist J creates an increased strength against twisting forces caused when one sill member moves longitudinally with respect to the other, thereby attempting to rotate the end portions **63** and **63**–**1** of the joist J.

FIG. 2 illustrates a stabilizer F–**2** according to the present invention intended for use with a joist having longer vertical surfaces than **61** and **62**, and narrower horizontal surfaces than **60**, of the joist J in FIG. 1. Stabilizer F–**2** is the same as stabilizer F except that the upper flange portion **225** is somewhat longer, a distance H–**1**, than the upper flange portion **25** of FIG. 1, with an additional aperture **224** for use with additional affixing means. The horizontal flange portion **230** is somewhat more narrow than the horizontal flange portion **30** of FIG. 1. The portions of stabilizer F–**2** unchanged from stabilizer F are given the same identifying numbers as those of stabilizer F in FIG. 1.

FIG. 3 illustrates a stabilizer F–**3** according to the present invention intended for use with a joist having somewhat shorter vertical surfaces than **61** and **62**, and somewhat wider horizontal surfaces than **60** of the joist

J in FIG. 1. Stabilizer F–**3** is the same as stabilizer F except that the upper flange portion **325** is somewhat shorter than flange portion **25** of FIG. 1, and the horizontal flange portion **330** is somewhat broader than the horizontal flange portion of FIG. 1. The portions of stabilizer F–**3** unchanged from stabilizer F are given the same identifying numbers as those of stabilizer F in FIG. 1.

Although first flange **10** and lower flange section **20** of second flange **28** have been shown in the drawings as forming a right angle iron, this is merely illustrative of a preferred embodiment of the present invention where joist J is transverse sill members S and S–**2** in a direction perpendicular to their longitudinal axis. If a somewhat longer joist J were used and situated transverse sill members S and S–**2** in some other manner, such as a 45 degree angle of intersection, stabilizer means F could be accordingly modified by varying the angle of intersection formed by first flange **10** and lower flange section **20** so that it corresponded to the new angle of intersection.

The foregoing disclosure and description of the invention are illustrative and explanatory thereof, and various changes in the size, shape, and materials as well as in the details of the illustrated construction may be made without departing from the spirit of the invention.

I claim:

1. A self-positioning floor joist stabilizer for affixing a joist atop and transversely to a sill to provide a foundation for a mobile home or the like, comprising:

a first flange for engaging a sill along a substantially vertical longitudinal surface thereof and having apertures therein for receiving means to affix said first flange to the sill;

a second flange connected to said first flange at an angle with respect to each other for engaging a joist along a vertical surface thereof and having apertures therein for receiving means to affix said second flange to the joist, said second flange comprising:

a lower flange section connected to said first flange;

an upper flange section comprising a vertical extension of said lower flange section;

a topmost portion of said upper flange section displaced at an angle from the vertical in a direction substantially opposite to that of the lower flange section for disposing at least a part of said topmost portion directly over the sill; and

said topmost portion having a lower edge disposed above and spaced a substantial distance from the upper edge of said first flange;

a third flange connected to said topmost portion of said second flange at an angle with respect to each other and generally lying in a plane transverse the plane in which said first flange lies and engaging an end portion of the joist atop a transverse surface thereof at least in part directly above the sill, imposing a force compelling the joist against the sill; and

said third flange being vertically spaced a distance from said lower edge of said topmost portion which is substantially less than the distance said third flange is vertically spaced from said upper edge of said first flange, whereby joists of different thicknesses may be clamped by said third flange without any engagement of said lower edge of said topmost portion with the sill therebelow to thus provide self-positioning of the stabilizer on the joist.

2. The structure of claim **1**, including:

a fourth flange connected to said third flange at an angle with respect to each other and generally lying in a plane substantially parallel that of said second flange for engaging the joist along a second sub-

stantially vertical surface thereof, and having apertures therein for passage of means to affix said fourth flange to the joist.

3. The structure of claim 2, wherein the angle between said first flange and said lower flange section of said second flange is approximately a right angle whereby said first flange and said lower flange section of said second flange form an angle iron; and

said upper flange section of said second flange, said third flange and said fourth flange are positioned with respect to each other so that said second flange and said fourth flange are substantially parallel and intersect said third flange at approximately right angles in a plane substantially perpendicular that of said angle iron, thereby forming a channel member.

4. The structure of claim 1, including a second floor joist stabilizer for affixing the joist atop and transverse a second sill comprising:

a first flange for engaging a second sill along a substantially vertical longitudinal surface thereof and having apertures therein for receiving means to affix said first flange to the second sill;

a second flange connected to said first flange at an angle with respect to each other for engaging a joist along a substantially vertical surface thereof and having apertures therein for receiving means to affix said second flange to the joist, said second flange comprising:

a lower flange section connected to said first flange;

an upper flange section comprising a vertical extension of said lower flange section;

a topmost portion of said upper flange section displaced at an angle from the vertical in a direction substantially opposite to that of the lower flange section for disposing at least a part of said topmost portion directly over the second sill; and

said topmost portion having a lower edge disposed above and spaced from the upper edge of said first flange; and

a third flange, connected to said topmost portion of said second flange at an angle with respect to each other and generally lying in a plane transverse to the plane in which said first flange lies and engaging an end portion of the joist atop a substantially horizontal surface thereof substantially directly above the second sill, imposing a force compelling the joist against the second sill.

5. The structure of claim 4, including:

a fourth flange means connected to said third flange means at an angle with respect to each other and lying generally in a plane substantially parallel to that of said second flange for engaging the joist along a second vertical surface thereof and having apertures therein for passage of means to affix said fourth means to the joist.

6. The structure of claim 5, wherein the angle between said first flange and said lower flange section of said second flange of said second stabilizer is approximately a right angle, whereby said first flange and said lower flange section of said second flange of said second stabilizer form an angle iron member;

said upper flange section of said second flange, said third flange and said fourth flange of said second stabilizer are positioned with respect to each other so that said second flange and said fourth flange are substantially parallel and intersect said third flange at approximately right angles in a plane substantially perpendicular to that of said angle iron, thereby forming a channel member.

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U.S. Cl. X.R.

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