June 13, 1939. B. HILLBERG 2,162,349

BAND CLAMP

Filed March 6, 1937

Fig. 1

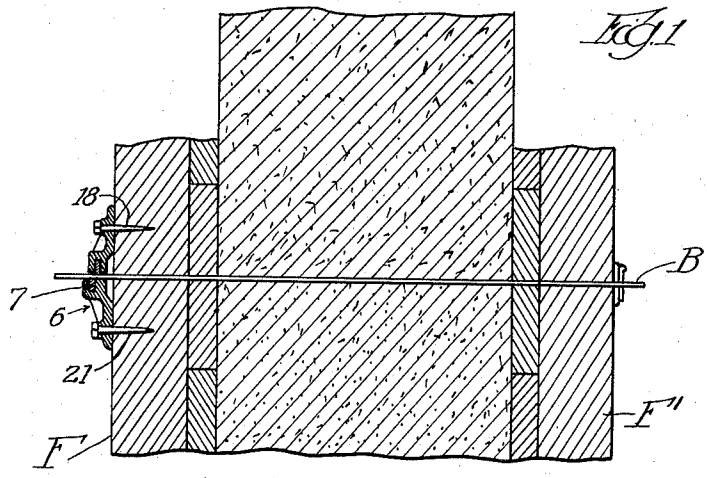


Fig. 3

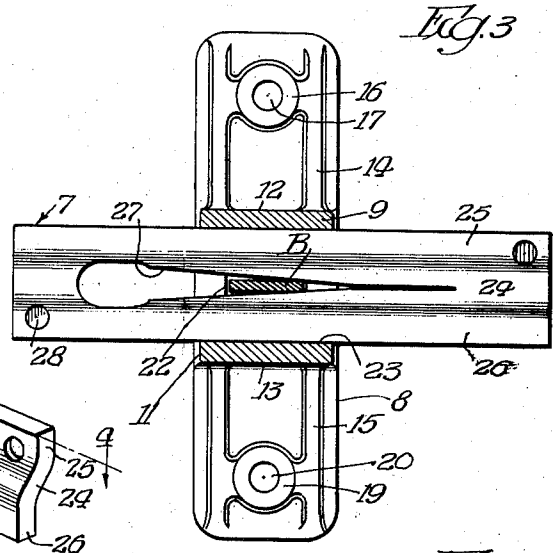


Fig. 2

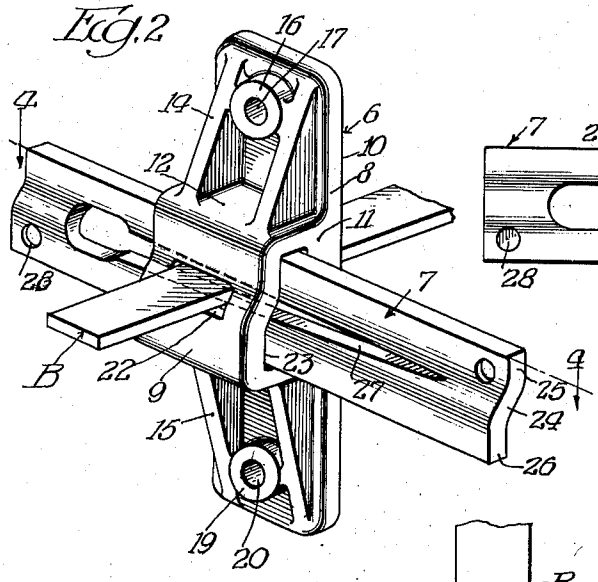


Fig. 5

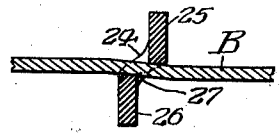


Fig. 4

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2,162,349

UNITED STATES PATENT OFFICE

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BAND CLAMP

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Application March 6, 1937, Serial No. 129,303

6 Claims. (Cl. 24—19)

The present invention relates generally to clamps for use in tying or holding against separation forms for concrete walls or like structures. More particularly the invention relates to that type of clamp which is known commercially as a band clamp, is adapted to be applied to one end of a metallic band extending between and through the forms and comprises (1) an elongated clamping bracket which is adapted to fit against the outer face of the form through which the one end of the band extends, and has a central slot therein for said one end of the band and also has a cross slot intersecting the band slot; and (2) a wedge member which extends through and fits slidably in the cross slot and is adapted when slid or driven in one direction to grip or wedge against the band and thus lock the clamping member to the band and against the contiguous form.

One object of the invention is to provide a band clamp of this type which is an improvement upon, and is more efficient than, previously designed clamps of the same general character by reason of the fact that it is so designed that the band is gripped or locked more securely in the clamping member and the wedge member is so designed that it is not likely to shear or sever the band when it is driven into its operative or wedged position.

Another object of the invention is to provide a clamp of the aforementioned type in which the wedge member is in the form of a metal stamping, has a longitudinally extending, band receiving, V-shaped slot in the central portion thereof, and is adapted when driven into its band locking or wedged position to grip the band between the portions or faces which define the sides of the V-shaped slot.

Another object of the invention is to provide a band clamp of the last mentioned character in which the central portion of the stamping formed wedge member is angularly or obliquely disposed with respect to the upper and lower side portions with the result that the portions or faces which define the sides of the V-shaped slot are laterally offset one with respect to the other and hence are adapted to engage the band at different points and cause bending or deflection of the band in opposite directions when the member is driven into its wedged position.

A further object of the invention is to provide a band clamp of the type and character under consideration in which the elongated clamping bracket is in the form of a metal casting and is so designed and reinforced that it efficiently fulfills its intended purpose and is not likely to fracture or break during use of the clamp.

A still further object of the invention is to provide a band clamp which is generally of new and improved construction and may be manufactured at a low and reasonable cost.

Other objects of the invention and the various advantages and characteristics of the present clamp will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

In the drawing which accompanies and forms a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views:

Figure 1 is a vertical sectional view showing a pair of laterally spaced wall forming forms with a metallic tie band therebetween and a clamp embodying the invention applied to one end of the band;

Figure 2 is a perspective view of the clamp showing in detail the design and arrangement of the clamping bracket and the wedge member;

Figure 3 is a vertical transverse sectional view illustrating the manner in which the band is gripped by the portions or faces of the wedge member which define the sides of the V-shaped slot in the wedge member;

Figure 4 is a horizontal section taken on the line 4—4 of Figure 2 and illustrating the cross-sectional design of the clamping bracket; and

Figure 5 is a detail sectional view illustrating the manner in which the wedge member when driven into its locking or wedged position grips the band and deflects or bends it in opposite directions.

The clamp which is shown in the drawing constitutes the preferred embodiment of the invention. It is of the so-called band variety and is shown in Figure 1 of the drawing in connection with a metallic band B and a pair of wall forming forms F and F^1. The forms are disposed in laterally spaced relation and are adapted to have concrete poured therebetween for wall forming purposes. The band B extends across the space between the two forms and together with the clamp serves to prevent separation of the forms during pouring of the concrete. One end of the band extends through the form F^1 and is anchored to the latter in any suitable manner. The other end of the band extends through the form F and has the clamp applied thereto.

The clamp is of two piece design and consists of a clamping bracket 6 and a wedge member 7.

The clamping bracket 6 is in the form of a metal casting. It is elongated vertically and embodies a rectangular plate-like inner part 8 and a centrally disposed enlargement 9. The part 8 projects above and below the enlargement 9 and has a flat inner face 10, which as shown in Figure 1, is adapted to fit flatly against the outer face of the form F. The enlargement 9 is formed integrally with and projects outwardly from the central portion of the inner plate like part 8 and embodies a pair of flat side faces 11, a substantially flat top face 12, and a substantially flat bottom face 13. The side faces 11 of the enlargement extend in parallel relation and are flush with the side faces of the part 8 of the bracket. The upper end of the part 8 is reinforced by means of a pair of triangular webs 14. These webs are disposed in laterally spaced relation and extend between and are formed integrally with the substantially flat top face 12 of the enlargement 9 and the outer face of the upper end of the part 8. The lower end of the inner plate-like part 8 is reinforced by means of a pair of laterally spaced webs 15. The latter are vertically aligned with the webs 14 and extend between and are formed integrally with the substantially flat bottom face 13 of the enlargement 9 and the outer face of the lower end of the part 8. A substantially cylindrical boss 16 is disposed between the upper ends of the webs 14 and is joined to said webs and the outer face of the upper end of the bracket part 8. A hole 17 extends through this boss and the contiguous portion of the upper end of the bracket part 8 and is adapted to receive a nail 18 for holding the clamping bracket in place on the outer face of the form F. A cylindrical boss 19 with a hole 20 therethrough for a bracket securing nail 21 is disposed between the lower ends of the triangular webs 15 and is attached to and formed integrally with the webs and the outer face of the lower end of the bracket part 8. By employing the hole equipped bosses 16 and 19 the clamping bracket may be readily secured in place by the nails 18 and 21 and by utilizing or employing the webs 14 and 15 the ends of the bracket part 18 are effectively reinforced. The clamping bracket 6 embodies a band receiving slot 22 and a substantially vertically extending cross-slot 23. The slot 22 is centrally disposed with respect to the enlargement 9 and extends between and through the front face of the enlargement and the central portion of the flat inner face 10 of the plate-like inner part 8 of the bracket. It is rectangular in cross-section and, as shown in Figure 1, is adapted to receive the end of the band B which extends through the form F. The inner end of the slot 22, that is, the portion of the slot within the vertically elongated plate-like part 8 of the bracket, is flared, as shown in Figure 4, so as to facilitate insertion of the band into the slot. The slot 22 extends at right angles to the flat inner face 10 of the plate-like part 8 and has slightly greater height and width than the band. In applying the clamping bracket 6 to the band, the band is inserted into the flared mouth or inner end of the slot 22 by manipulation of the bracket. Thereafter the bracket is shifted inwards against the form in order to cause the band to pass through the slot and project beyond the outer face of the enlargement 9 of the bracket. After so positioning or shifting the bracket, a suitable tool, as well understood in the art, is applied to the projecting end or extremity of the band and manipulated so as to force the clamping bracket together with the form inwardly into proper position. After such manipulation the wedge member 7, as hereinafter described, is shifted into a wedged position so as to clamp or lock the bracket to the band. The cross-slot 23 extends transversely through the enlargement 9 and serves as the bearing or slideway for the wedge member 7. It extends through the flate side faces 11 of the enlargement and the central portion thereof intersects the band receiving slot 22. Said central portion of the cross slot is obliquely disposed as far as the upper and lower portions of the slot are concerned and extends at approximately an angle of 45° with respect to the substantially flat top and bottom faces of the bracket enlargement 9. The upper and lower portions of the cross-slot 23 are laterally offset and are disposed respectively above and below the band receiving slot 22. They are arranged in parallel relation and extend at right angles to the top and bottom faces of the enlargement 9. The front face of the enlargement is shaped conformably to the cross-slot 23 and one portion thereof is shallower than the other and is joined to the latter by a centrally disposed oblique face. The shallow part of the enlargement and the oblique face together form a bearing for the tool which is used in tightening the clamping bracket with respect to the band B.

The wedge member 7 is in the form of a metal stamping. It extends horizontally through and fits slidably in the cross-slot 23 and has an angularly disposed or oblique central portion 24 and upper and lower side portions 25 and 26. The oblique central portion 24 fits slidably within the central portion of the cross-slot 23 and extends at approximately an angle of 45° with respect to the upper and lower side portions of the wedge member. Said upper and lower side portions of the member fit slidably in the upper and lower portions of the cross-slot respectively and are offset laterally one with respect to the other. The oblique or angularly disposed central portion 24 of the wedge member is provided with a longitudinally extending comparatively sharp V-shaped slot 27. This slot, as shown in Figure 2 and 3, terminates slightly inwards of the ends of the wedge member. The large end of the slot 27 is oval shaped and is of sufficient height and length that when aligned with the band receiving slot 22 it permits of readly passage of the band therethrough. The small or pointed end of the slot is in the form of a slit. The central portion of the slot is wedge shaped and is adapted when the wedge member 7 is slid horizontally in one direction to receive the band B. The faces of the wedge member which form the sides of the slot 28 extend at right angles to the side faces of the upper and lower side portions 25 and 26 of the wedge member and due to the oblique or angular arrangement of the central portion 24 of the wedge member are laterally offset (see Figure 5). When the band B extends through the slot 27 and the wedge member is driven in such direction that the large end of the slot moves away from the clamping bracket 6 the faces which form the sides of said slot 27 slide into engagement with the top and bottom side faces of the band, as shown in Figure 3. Because of the fact that the slot forming portions of the wedge member are laterally offset, as hereinbefore pointed out, the side faces of the band are gripped at different points and the band is caused to be bent or deflected in opposite directions, as shown in

Figure 5. The face or portion of the wedge member which defines the bottom of the slot 27 tends during sliding of the wedge into its operative position to bend and tilt the superjacent portion of the band upwards and the face or portion of the wedge member which defines the upper side of the V-shaped slot 27 operates during drive of the wedge into operative or wedged position to deflect and tilt the subjacent portion of the band downwards. Because of the bending and tilting action of the slot defining faces or portions of the wedge member the band is securely locked against longitudinal displacement with respect to the wedge member and hence the clamping bracket 6 is held in fixed relation with respect to the band. The ends of the wedge member are punched adjacent to the upper and lower corners thereof so as to form stops 28 for preventing the wedge member from being slid out of connected relation with the clamping bracket 6.

In applying the clamp to the band B, the wedge member 7 is slid or shifted horizontally until the large end of the V-shaped slot 27 registers with the band receiving slot 22 in the enlargement 9 of the bracket. Thereafter the bracket is positioned on the end of the band which projects through the form F, and is slid into abutting relation with the form. When in such position the nails 18 and 21 are inserted respectively in the holes 17 and 20 and are driven into the form F so as to secure the bracket to the form. After securing the bracket in place a tightening tool is applied to the extreme outer end of the band B and manipulated until the bracket and the form F are properly positioned with respect to the band. As soon as the bracket is properly positioned the wedge member 7 is slid horizontally into its operative or wedged position. During sliding of the wedge member into place the faces which define the sides of the V-shaped slot 27 slide into engagement with the top and bottom faces of the band B and bend the band in opposite directions, as hereinbefore pointed out. Upon shift of the wedge member into place the clamp is securely locked to the band. When after pouring and setting of the concrete between the forms F and F^1, it is desired to remove the clamp it is only necessary to drive the wedge member 7 in the reverse direction so as to release the band B. Upon release of the band by the wedge member, the bracket together with the wedge member may be slide out of engagement with the band. By reason of the fact that the band receiving slot 22 in the enlargement 9 of the bracket has slightly greater height than the band B, the bracket may be readily slid out of engagement with the band even though the latter is deflected or bent in a pronounced manner by the wedge member 7.

The herein described clamp may be manufactured at a comparatively low cost. It is extremely durable due to the construction and design of the clamping member 6 and is exceptionally efficient in operation due to the wedging or locking action of the wedge member 7 and the fact that the band is gripped by the wedge-member only.

Whereas the clamp has been described in connection with a pair of wall forming forms F and F^1, it is to be understood that it may be used generally as a band clamp and in connection with other types of forms. It is also to be understood that the invention is not to be restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

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

1. A clamp adapted for application to a band having one end thereof projecting through and beyond a form, and comprising a bracket adapted to fit against the form and provided with a slot therethrough for the projecting end of the band and a second slot extending transversely therethrough and having the central portion thereof intersecting the band slot, and an elongated wedge member extending longitudinally through and slidably mounted in said second slot and having a longitudinally extending V-shaped band receiving slot in the central portion thereof in registry with the band slot of the bracket, and having the faces thereof that define the sides of said V-shaped band receiving slot adapted in response to sliding movement of the wedge member in one direction to grip both side faces of the band with a wedging action and to hold the bracket in connected relation with and against movement relatively to said band.

2. A clamp adapted for application to a band having one end thereof projecting through and beyond a form, and comprising a bracket adapted to fit against the form and provided with a slot therethrough for the projecting end of the band and a second slot extending transversely therethrough and intersecting the band slot, and an elongated wedge member extending longitudinally through and fitting slidably in said second slot and having a longitudinally extending V-shaped band receiving slot therein in registry with said band slot of the bracket, and having the faces thereof that define the sides of said V-shaped band receiving slot laterally offset and adapted in response to sliding movement of the wedge member in one direction to engage and grip the side faces of the band at different points and with a wedge action and to hold the bracket in connected relation with and against movement relatively to the band.

3. A clamp adapted for application to a band having one end thereof projecting through and beyond a form, and comprising a bracket adapted to fit against the form and provided with a slot therethrough for the projecting end of the band and a second slot extending transversely therethrough and having a portion thereof intersecting the band slot and tilted sidewise at an acute angle relatively thereto, and an elongated wedge member extending longitudinally through and slidably mounted in said second slot and having a longitudinally extending V-shaped band receiving slot in the portion thereof which fits within the aforesaid portion of the second slot, and having the faces thereof that define the sides of said V-shaped band engaging slot adapted in response to sliding movement of the wedge member in one direction to grip the side faces of the band at different points and with a wedging action and to hold the bracket in connected relation with and against movement relatively to the band.

4. A clamp adapted for application to a band having one end thereof projecting through and beyond a form, and comprising a bracket adapted to fit against the form and provided with a slot therethrough for the projecting end of the band and a second slot extending transversely therethrough and having the central portion thereof intersecting the band slot and tilted sidewise at

approximately an angle of 45° with respect to the latter, and an elongated stamping formed wedge member extending longitudinally through and slidably mounted in said second slot and having a longitudinally extending V-shaped band receiving slot in the central portion thereof in registry with said band slot of the bracket, and having the faces thereof that define the sides of said V-shaped band engaging slot adapted in response to sliding movement of the wedge member in one direction to grip the side faces of the band at different points and with a wedging action and to hold the bracket in connected relation with and against movement relatively to the band.

5. A clamp adapted for application to a band having one end thereof projecting through and beyond a form, and comprising a bracket adapted to fit against the form and provided with a slot therethrough for the projecting end of the band and a second slot extending transversely therethrough and having the central portion thereof intersected, and is tilted at an acute angle relatively to the band slot and the side portions thereof disposed in laterally offset and parallel relation and at right angles to said band slot, and an elongated wedge member of the same cross-sectional design as said second slot extending longitudinally through and slidably mounted in the latter and having a longitudinally extending V-shaped band receiving slot in the central portion thereof, and having the faces thereof that define the sides of said V-shaped band receiving slot adapted in response to sliding movement of the wedge member in one direction to grip the side faces of the band at different points and with a wedge action and to hold the bracket in connected relation with and against movement relatively to the band.

6. A clamp adapted for application to a band having one end thereof projecting through and beyond a form, and comprising a bracket adapted to fit against the form and provided with a slot therethrough for the projecting end of the band and a second slot extending transversely therethrough and having the central portion thereof intersecting and is tilted at approximately an angle of 45° with respect to, the band slot and the side portions thereof disposed in laterally offset and parallel relation and at right angles to said band slot, and an elongated stamping formed wedge member of the same cross-sectional design as the second slot extending longitudinally through and slidably mounted in said second slot and having a longitudinally extending V-shaped band engaging slot in the central portion thereof in registry with the band slot of the bracket and having the faces thereof that define or form the sides of said V-shaped band engaging slot extending at right angles to the side faces of its side portions, and adapted in response to sliding movement of the wedge member in one direction to grip the side faces of the band at different points and with a wedging action and to hold the bracket in connected relation with and against movement relatively to the band.

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