

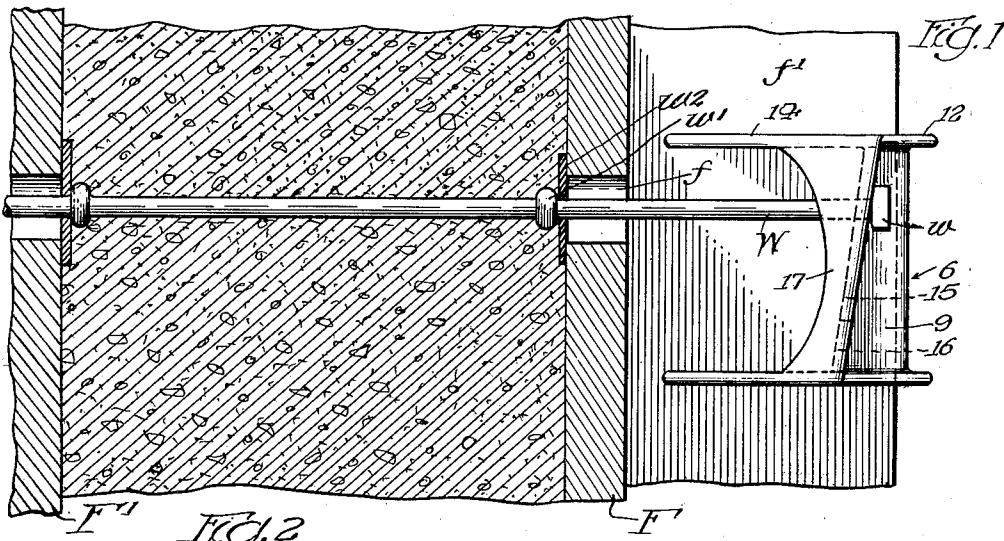
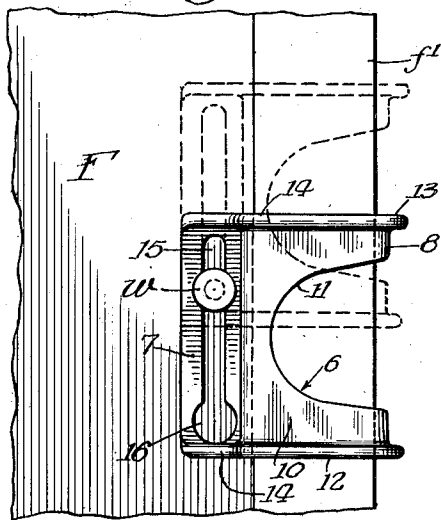
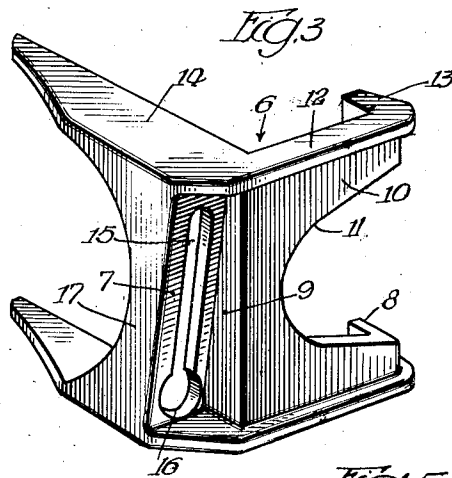
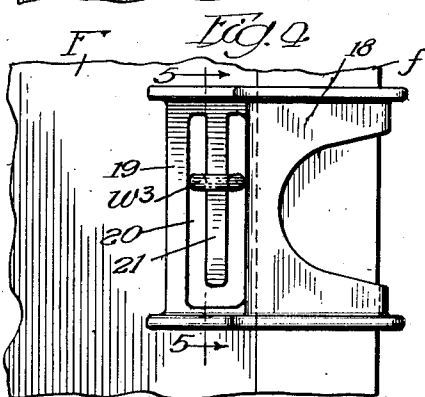
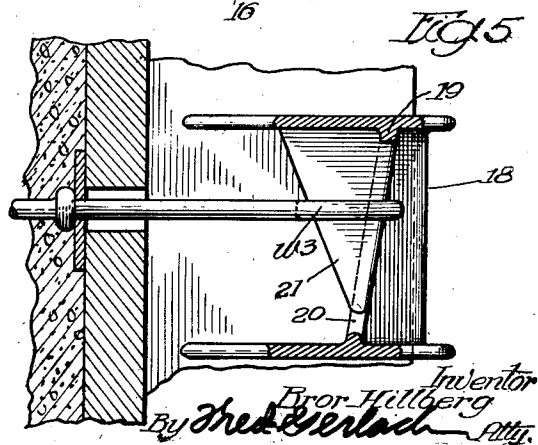
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TIE WIRE CLAMP

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TIE WIRE CLAMP

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The present invention relates generally to clamps for use in tying together and 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 tie wire clamp, is adapted to be applied to one end of a tie wire extending between and through the forms and comprises: (1) a bracket which is designed to fit around, and abut against, a reinforcing beam such as a stud or wale on the outer face of the form through which the one end of the wire extends; and (2) a wedge element which is associated with the bracket and is adapted to coact with an enlargement on the one end of the tie wire in such manner as to urge the bracket into clamped relation with the beam and thus retain or hold the beam equipped form in connected relation with the tie wire.

One object of the invention is to provide a clamp of this type which is generally an improvement upon, and has certain advantages over, previously designed tie wire clamps of the same general character by reason of the fact that it is of one piece or unitary design.

Another object of the invention is to provide a tie wire clamp in which the bracket is of U-shaped design in order to accommodate or receive the reinforcing beam and the wedge element is in the form of an angularly disposed shelf which is formed integrally with one leg of the bracket, has a longitudinally extending slot therein for the end of the tie wire with the enlargement, and operates in response to sliding movement of the bracket on the reinforcing beam to engage the enlargement with a wedge action and to coact therewith in such manner as to clamp the bracket firmly against the beam and thus retain the beam equipped form in fixed or connected relation with the tie wire.

A still further object of the invention is to provide a tie wire clamp which not only is of new and improved construction but also is in the form of a one piece casting and hence may be manufactured at an extremely low cost.

Other objects of the invention and the various advantages and characteristics of the present tie wire 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 letters and numerals of reference denote corresponding parts throughout the several views:

Figure 1 is a vertical section of a pair of laterally spaced wall forming forms with a tie wire therebetween and a clamp embodying one form of the invention applied to one end of the tie wire;

Figure 2 is a front view of the clamp illustrating in detail the construction and arrangement of the bracket and the wedge forming shelf and showing the manner in which the shelf coacts with the enlargement on the adjacent end of the tie wire to urge the bracket into clamped relation with the reinforcing beam when the bracket is slid lengthwise of the beam;

Figure 3 is a perspective of the clamp which is shown in Figures 1 and 2;

Figure 4 is a front view of a clamp embodying a second or modified form of the invention; and

Figure 5 is a vertical section on the line 5—5 of Figure 4.

The clamp which is shown in Figures 1, 2 and 3 of the drawing constitutes one form of the invention. It is essentially of the tie wire variety or type and is illustrated in connection with a tie wire W and a pair of wall forming forms F and F¹. The forms are disposed in laterally spaced relation and are adapted to have concrete poured therebetween for wall forming purposes. The tie wire W 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 tie wire W extends through the form F¹ and is anchored to the latter in any suitable manner. The other end of the tie wire extends through a hole f in the form F and projects outwardly beyond the form and in parallel relation with, and close proximity to, a reinforcing beam f¹, such as a stud or wale on the outer face of said form F. The outer extremity of the end of the tie wire which projects through the hole f is provided with an enlargement in the form of a head w. The hole f in the form F is of sufficient size to permit the head w to pass therethrough in connection with assembly of the tie wire W with respect to the form F. Immediately adjacent the inner end of the hole f the tie wire W is provided with an enlargement w¹ and a washer w². The washer is mounted snugly on the tie wire W and is interposed between the enlargement w¹ and the inner face of the form F. It serves to prevent out-flow of concrete through the hole f in the form F and coacts with the enlargement

w^1 to form a stop shoulder whereby inward movement of the form F with respect to the tie wire W is limited.

The clamp of Figures 1, 2 and 3 is associated with the projecting end of the tie wire W, i. e., the end with the head w . It constitutes a medium for holding the form F against the washer w^2 and thus serves to hold the form F in fixed or connected relation with the tie wire W. As shown in Figure 3 of the drawing, the clamp constituting the first form of the invention is in the form of a one piece metal casting and comprises a bracket 6 and a shelf 7. The bracket 6 is of U-shaped design and is adapted to fit around, and slide on, the outer portion of the reinforcing beam f^1 of the form F. It comprises a pair of side legs 8 and 9 and an intermediate leg 10. The intermediate leg corresponds in width to, and is adapted to abut and fit flatly against, the outer face of the reinforcement beam f^1 , as shown in Figures 1 and 2. It has a central cutout 11 adjacent the side leg 8 for weight reducing purposes and embodies along the end edges thereof integral outwardly extending reinforcing ribs 12. The leg 8 is in the form of a pair of hooks and these extend inwardly and at right angles to the intermediate leg 10 and are designed to fit against, and to slide on, the side face of the reinforcing beam f^1 that is farther from the projecting or head equipped end of the tie wire W. Outwardly extending end ribs 13 in the nature of continuations of the ribs 12 serve to reinforce the hooks constituting the side leg 8. The side leg 9 of the bracket 6 extends inwardly from, and at right angles to, the intermediate leg 10 and is adapted to fit against, and slide on, the side face of the reinforcing beam f^1 that is directly opposite the head equipped end of the tie wire W. It is longer than the side leg 8 and has at the ends thereof outwardly extending ribs 14 for reinforcing purposes. The ribs 14 are coplanar with, and are in the nature of continuations of, the ribs 12. The side legs 8 and 9 are spaced apart by the intermediate leg 10 a distance substantially equal to the width of the reinforcing beam f^1 with the result that they fit firmly against the side faces of the reinforcing beam when the bracket 6 is in place.

The shelf 7 is associated with the side leg 9 of the bracket 6 and constitutes the wedge element of the clamp of Figures 1, 2 and 3. It fits between, and is joined at its ends to, the outer ends of the ribs 14, as shown in Figure 3, and extends at right angles to the leg 9. As illustrated in the drawing the shelf 7 extends at an acute angle with respect to the intermediate leg 10 of the bracket 6 and has a longitudinally extending slot 15. The low end of the slot 15, that is, the end that is farther from the leg 10, has a circular enlargement 16 to permit the head w of the tie wire W to pass therethrough. The main portion of the slot 15 corresponds in width to the tie wire W and is narrower than the head w . It is adapted to receive the projecting end of the tie wire when the clamp is in its operative position. When the clamp is in place the head w of the tie wire W fits against the outer face of the shelf 7, as shown in Figures 1 and 2. When the clamp is driven in the direction of the end of the slot 15 with the enlargement 16 the head w rides toward the outer or high end of the shelf 7 and as a result of the wedge action which is produced the clamp is brought into clamped relation with the reinforcing beam f^1 and serves to hold the form F in clamped relation against

the washer w^2 . In order to reenforce the shelf 7 against bending or fracture in connection with use of the clamp a web 17 is provided. This web is joined to, and projects inwardly from, the outer margins of the shelf 7 and is connected at its ends to the reinforcing ribs 14.

The clamp of Figures 1, 2 and 3 is assembled by first placing the bracket 6 around the outer portion of the reinforcing beam f^1 in such manner that the head w of the tie wire W is in alignment with the enlargement 16 of the slot 15. Thereafter the clamp is shifted inwards in order to bring the head w of the tie wire W through the enlargement 16 into a position wherein it is outwards of the shelf 7. After this operation the clamp is hammered or otherwise driven in the direction of the enlargement 16. During this operation the clamp moves relatively to the projecting or head equipped end of the tie wire and the head rides up on the shelf 7. Because of the angularity of the shelf there is a wedge action which causes the clamp to move inwards into clamped relation with the reinforcing beam f^1 , that is, a position where it holds the form F in firm abutment with the washer w^2 on the tie wire W. When it is desired to dismantle the clamp after pouring and hardening of the concrete between the forms F and F¹ the clamp is driven in the direction of the high end of the shelf 7. This brings the clamp out of wedged relation with the head w and permits it to be removed from the projecting end of the tie wire W. Upon removal of the clamp from the end of the tie wire the form F is released for removal from the concrete wall.

The clamp of Figures 1, 2 and 3 effectively and efficiently fulfills its intended purpose and because it is in the form of a one piece casting it may be produced at a low and reasonable cost. It may be assembled and dismantled with facility and is adapted or designed to be used with like clamps and tie wires. Whereas only a single clamp has been shown it is to be understood that in practice a like or similar clamp may, if desired, be used on the end of the tie wire W that projects through the form F¹.

The clamp of Figures 4 and 5 constitutes a second or modified form of the invention. It is substantially the same as the clamp of Figures 1, 2 and 3 except that it is expressly designed and adapted for use in connection with a tie wire having a hook w^3 at the extremity of its projecting end. As shown in Figures 4 and 5, the modified form of clamp is in the form of a one piece casting and comprises a U-shaped bracket 18 and a wedge type shelf 19. The bracket 18 is the same in design and construction as the bracket 6. The shelf 19 is associated with, and connected to, the long leg of the bracket 18 and is disposed at an acute angle with respect to the intermediate leg of said bracket 18. It functions like the shelf 7 and is provided with a longitudinally extending U-shaped slot 20. The center or intermediate portion of the shelf constitutes a tongue 21 for receiving and engaging slidably the bent portion of the hook w^3 . The central portion of the slot 20 is positioned at the low end of the shelf 19 and permits the hook w^3 to pass through the shelf and be manipulated into hooked relation with the tongue 21. One of the side portions of the U-shaped slot 20 is adapted to receive the main portion of the projecting end of the tie wire and the other side portion of said slot is adapted, as shown in Figure 4, to re-

ceive the intumed or inwardly bent part of the hook w^3 .

The clamp of Figures 4 and 5 is applied or assembled by first manipulating the bracket 18 into straddled relation with the outer portion of the reinforcing beam of the form with which the clamp is to be used and then positioning the clamp so that the curved central or intermediate portion of the slot 20 in the shelf 19 is in alignment with the hook w^3 . Thereafter the clamp is moved inwards in order to bring the hook through the slot in the shelf 19. After this step or operation the clamp is driven in the direction of the low end of the shelf. This causes the hook w^3 to ride up on the tongue 21 and results in clamping of the clamp to the reinforcing beam. When the clamp is in place the unbent part or portion of the hook w^3 is confined within the adjacent side portion of the slot 20 and hence there is no likelihood of the hook being bent open in response to the wedge action which is produced during driving of the clamp into place.

The invention is not to be understood as 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 tie having one end thereof anchored and its other end provided with an enlargement at its extremity and projecting through and beyond a form with a reinforcing beam on its outer face adjacent the projecting end of the tie, and comprising a bracket shaped to fit around, and slide longitudinally on, the outer part of the beam, and an angularly disposed shelf at one side of the bracket having a slot therein for receiving said projecting end of the tie and adapted in response to sliding movement of the bracket in one direction relatively to the beam to engage the enlargement with a wedge action and to coact therewith in such manner as to urge the bracket into clamped relation with the beam and hold the beam and form in connected relation with the tie.

2. A clamp adapted for application to a tie having one end thereof anchored and its other end provided with an enlargement at its extremity and projecting through and beyond a form with a reinforcing beam on its outer face adjacent the projecting end of the tie, and comprising a U-shaped bracket shaped to straddle and slide longitudinally on the outer part of the beam, and an angularly disposed shelf connected to, and projecting outwardly from, one of the side legs of the bracket, provided with a longitudinal slot therein for receiving said projecting end of the tie, and adapted in response to sliding movement of the bracket in one direction relatively to the beam to engage the enlargement with a wedge action and to coact therewith in such manner as to urge the bracket into clamped relation with the beam and hold the beam and form in connected relation with the tie.

3. A clamp adapted for application to a tie having one end thereof anchored and its other end provided with an enlargement at its extremity and projecting through and beyond a form with a reinforcing beam on its outer face

adjacent the projecting end of the tie, and comprising a U-shaped bracket shaped to straddle, and slide lengthwise of, the outer part of the beam and having one side leg thereof longer than the other, and an angularly disposed shelf connected to, and projecting radially from, the root portion of the long side leg of the bracket, provided with a slot therein for receiving said projecting end of the tie, and adapted in response to sliding movement of the bracket in one direction relatively to the beam to engage the enlargement with a wedge action and to coact therewith in such manner as to urge the bracket into clamped relation with the beam and hold the beam and form in connected relation with the tie.

4. A clamp adapted for application to a tie having one end thereof anchored and its other end provided with an enlargement at its extremity and projecting through and beyond a form with a reinforcing beam on its outer face adjacent the projecting end of the tie, and comprising a bracket shaped to fit around, and slide lengthwise of, the outer part of the beam, and an angularly disposed shelf connected to, and projecting outwardly from, one side of the bracket and having formed therein a longitudinal slot adapted to receive said projecting end of the tie and having at its low end an enlargement to permit of insertion therethrough of the enlargement at said extremity of the projecting end of the tie, said shelf being adapted in response to sliding movement of the bracket in one direction relatively to the beam and after insertion of the tie enlargement through the enlargement at the low end of the slot to engage said tie enlargement with a wedge action and to coact therewith in such manner as to urge the bracket into clamped relation with the beam and hold the beam and form in connected relation with the tie.

5. A one piece cast metal clamp adapted for application to a tie wire having one end thereof anchored and its other end provided with a head at its extremity and projecting through and beyond a form with a reinforcing beam on its outer face adjacent the projecting end of the tie wire, and comprising a U-shaped bracket shaped to straddle, and slide longitudinally on, the outer part of the beam, and an angularly disposed shelf connected to, and projecting laterally from, one of the side legs of the bracket and provided with a longitudinal slot adapted to receive the projecting end of the tie wire and embodying at its low end an enlargement for permitting the head of the tie wire to pass therethrough, said shelf being adapted in response to sliding movement of the bracket in the direction of the enlargement to engage the head with a wedge action and to coact therewith in such manner as to urge the bracket into clamped relation with the beam and hold the beam and form in connected relation with the tie.

6. A clamp adapted for application to a tire wire having one end thereof anchored and its other end provided with a hook at its extremity and projecting through and beyond a form with a reinforcing beam on its outer face adjacent the projecting end of the tie wire, and comprising a bracket shaped to fit around, and slide longitudinally on, the outer part of the beam, and a tongue connected to, and spaced laterally from, one side of the bracket and having an angularly disposed outer edge adapted to receive the hook

of the tie wire and further adapted in response to sliding movement of the bracket in one direction relatively to the beam to engage the hook with a wedge action and to coact therewith in such manner as to urge the bracket into clamped relation with the beam and hold the beam and form in connected relation with the tie.

7. A clamp adapted for application to a tie wire having one end thereof anchored and its other end provided with a hook at its extremity and projecting through and beyond a form with a reenforcing beam on its outer face adjacent the projecting end of the tie wire, and comprising a U-shaped bracket shaped to straddle, and slide lengthwise of, the outer part of the beam, and

an angularly disposed shelf connected to, and projecting laterally from, one side of the bracket and provided with a longitudinally extending U-shaped slot adapted to receive the hook of the tie wire and arranged so that the central portion thereof is disposed at the low end of the shelf and permits the hook to pass therethrough, said shelf being adapted in response to sliding movement of the bracket in one direction relatively to the beam to engage the hook with a wedge action and coact therewith in such manner as to urge the bracket into clamped relation with the beam and hold the beam and form in connected relation with the tie.

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