June 25, 1940. F. LA GROTTA 2,205,662

FORM TIE

Filed Jan. 4, 1938

Fig. 1.

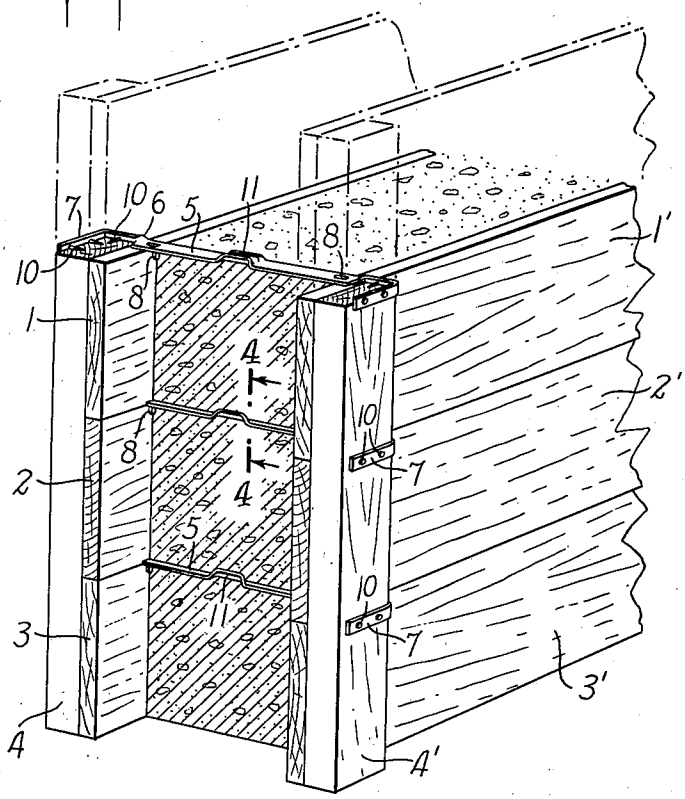


Fig. 4.

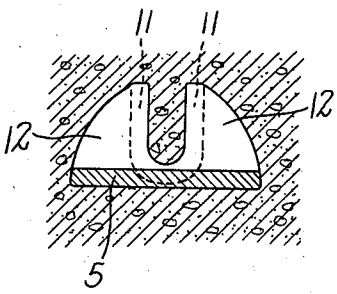


Fig. 2.

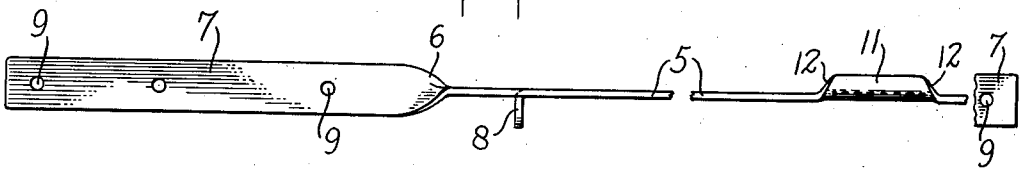
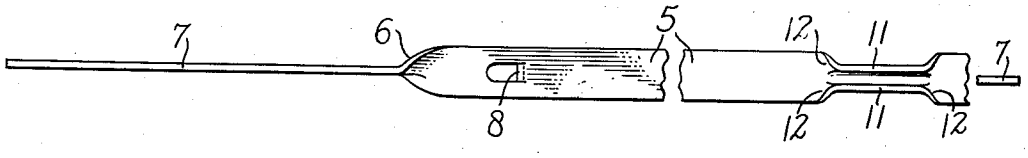


Fig. 3.



INVENTOR
Frank La Grotta
BY
Blair, Curtis, Dunner & Hayward
ATTORNEYS

Patented June 25, 1940 2,205,662

UNITED STATES PATENT OFFICE

2,205,662

FORM TIE

Frank La Grotta, New York, N. Y., assignor to Conver Steel & Wire Co. Inc., New York, N. Y., a corporation of New York

Application January 4, 1938, Serial No. 183,243

2 Claims. (Cl. 25—131)

This invention relates to a form tie.

It is the practice, in constructing concrete walls, such as retaining or foundation walls, to erect a form of spaced boards which are held in position by various means, and to pour the concrete within the form thus erected.

One method of erecting such a form involves the tying together of the opposing boards by form ties, which, after the concrete is set, remain within the concrete, the protruding ends of which are, during the pouring and setting of the concrete, engaged with the form, being twisted, or cut off, upon the removal of the form.

This removal of the ends of the form ties and of the forms from the ties, loosens the ties within the concrete so that, in effect, a passage is created through the concrete wall at each tie, which passage is increased in size by the oxidation of the metal tie. This increase in size, of course, increases the possibility of water seeping from the outside to the inside of the wall. The present invention seeks to eliminate this disadvantage in that provision is made to prevent the loosening of the tie within the wall as the forms are removed and as the ends of the tie are removed.

In the drawing:

Figure 1 is a form of tie embodying my invention, the same being applied to a form and the concrete being shown as poured;

Figure 2 is a side elevation of such a tie;

Figure 3 is a plan view of the same; and

Figure 4, a section at line 4—4 of Figure 1.

Referring now to the drawing, the form is created by erecting a series of boards 1, 2, 3, 1', 2', 3', which, of course, may be of any desired number, depending upon the extent of the wall to be erected. These boards are arranged in spaced relation and substantially horizontally. Studdings 4, 4' are arranged vertically on the outsides of the form boards and throughout the horizontal length of the form.

In order that the form boards may be held in proper position and yet removed after the concrete of the wall is set, form ties are extended between the studdings 4, 4' and are secured thereto. These ties lie between the boards of the form, as illustrated in Figure 1.

In the form of the tie that constitutes this invention, the intermediate portion 5 is substantially flat and has its end portions twisted at 6 so that projections 7 lie in planes at right angles to the intermediate portion 5. Spaced substantially the thickness of the form boards from the point of twist 6 at each end of the intermediate portion 5 of the tie, are lugs 8 which may be struck from this intermediate portion and are adapted to project downwardly so as to engage the inner surface of the form boards.

The extensions 7 are provided with apertures 9 for the reception of securing members, such as nails. In using this form of tie, after the opposing boards 3 and 3', for instance, have been erected and the studdings 4, 4' have been put in place, the form tie is placed as illustrated in Figure 1 so that the lugs 8 engage the inner surfaces of these form boards 3 and 3'. The extensions 7 of the tie are then bent around the studdings and secured thereto, as for instance, by nails 10. It will be noted that the edges of the form boards lie within the spaces between the points of twist 6 and the lugs 8 so that because of these lugs and of the securement of the extensions of the tie to the studdings 4 or 4', the form boards are absolutely positioned.

The intermediate portion of the form tie is crimped, forming what I shall term longitudinal flanges 11 and transverse anchors 12.

When the concrete wall is poured the form ties will be imbedded in the concrete and will completely surround the intermediate portion of the tie. This concrete will at the crimp of the intermediate portion form what will amount to a combined dam and lock. In other words, the cooperation between the said concrete and this crimped portion will prevent the movement of the tie longitudinally within the concrete and at the same time, will form a dam to prevent any moisture following the tie.

After the concrete is set, the studdings 4, 4' of the form boards, may be removed in the usual manner, as for instance, by prying them loose from the ties, and the protruding ends of the ties may then be twisted off, a procedure which is usually followed. Normally the removal of the form boards and the studdings and the twisting off of one end of the tie has a tendency to cause the tie to move in one direction, and when the form boards and studding on the opposite ends of the tie are removed, it has a tendency to move the tie in the opposite direction. This loosens the tie within the concrete since the only bond between the concrete and the tie is caused by the adhesion of the two aligned parallel surfaces. The result of this is that a passageway is formed from the outside to the inside of the wall. The water or moisture follows this passageway and finds its way onto the inner surface of the wall. This passageway is increased in size as the exposed tie gradually oxidizes.

The provision of the crimped portion in the intermediate portion of the tie of the present invention obviates this disadvantage since the anchors 12 contacting with the said concrete prevent the movement of the tie in either direction and cooperate with the longitudinal flanges 11 to effectively accomplish this result. Moreover, these flanges 11 and anchors 12 cooperating with the surrounding concrete, form what may be termed an intermediate dam unit which absolutely breaks the continuity of the tie from one surface to the other of the wall and obviates even the slightest possibility of moisture following through from one surface to the other of the wall. Referring to Figures 2, 3 and 4 it is to be noted that the crimping of the tie to form the flanges 11 is such that the anchor members 12 extend abruptly transversely of the body 5, and it is to be noted also that in this crimping the bottom of the channel formed by the flanges 11 is raised above the upper plane of the body 5. This is particularly shown in Figure 4 of the drawing. Thus there is no single continuous surface or edge that extends from end to end of the body portion 5 of the tie. The side edges are interrupted as shown in Figure 3. The bottom face is interrupted, as shown in Figure 2, and the top face is interrupted as shown in Figure 4. The side edges are interrupted by the raising of the flanges 11. Thus the raising of the bottom of the channel formed by the flanges 11 above the upper surface of the body 5 of the tie prevents the creeping of the moisture continuously along the upper surface from the outer to the inner side of the wall. That is because this surface is interrupted. Likewise the creeping of the moisture along the bottom surface, where the creeping would be less, is prevented by the interruption of the bottom surface. The same is true of both of the edges of the body because these are interrupted by the production of the flanges 11. Thus the crimped portion of the tie intermediate its ends performs the dual function of providing means for preventing the lateral or longitudinal movements of the tie and also for preventing the creeping of the moisture from the outside to the inside of the wall in which the tie is incorporated.

While I have illustrated and described a particular embodiment of my invention, I do not wish to be limited to the details thus illustrated, except insofar as such limitation is necessitated by the claims.

I claim:

1. A form tie having end portions and a flat intermediate portion, flanges formed on the intermediate portion and extending outwardly from one face thereof to form a relatively narrow channel, and walls extending transversely of the body of the tie, the bottom of the channel being raised above the plane of the adjacent surface of the tie whereby the continuity of said surface of the tie is interrupted.

2. A form tie having end portions and a flat intermediate portion, the flat portion being crimped between its ends to form a channel member, the side members of the channel member being inset from the edges of the intermediate portion of the tie, the bottom of the channel member being located above the adjacent plane of the intermediate portion of the tie and the end portions of the flanges extending abruptly transversely of said intermediate portion.

FRANK LA GROTTA.