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2,656,581

CONCRETE FORM TIE

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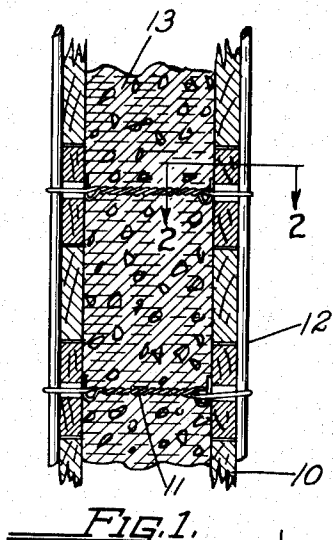


FIG. 1.

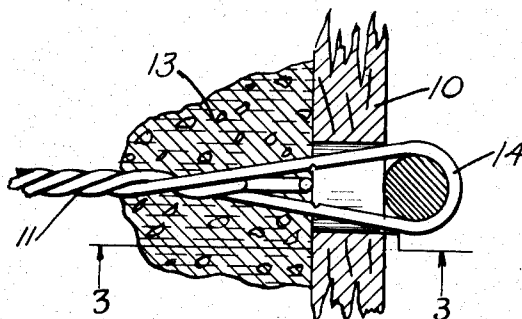


FIG. 2.

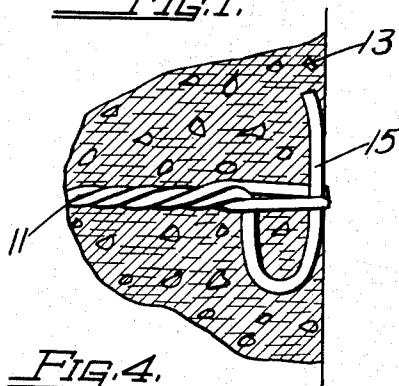


FIG. 4.

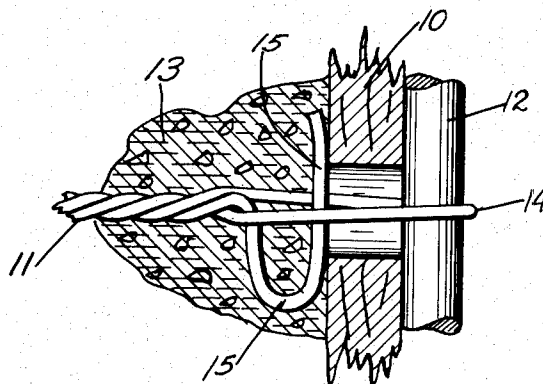


FIG. 3.

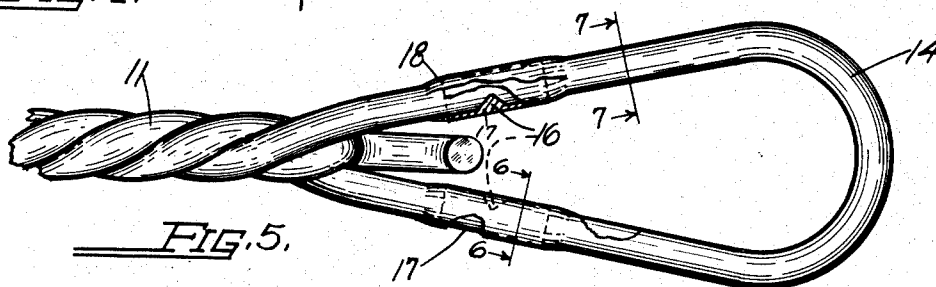


FIG. 5.

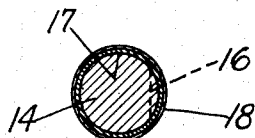


FIG. 6.

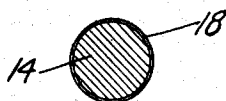


FIG. 7.

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CONCRETE FORM TIE

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4 Claims. (Cl. 25—131)

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This invention relates to improvements in concrete form ties and has reference to an improvement of ties terminating in loops for the reception of upright tie rods positioned on the outside of the forms.

Concrete form ties of the type to which this invention relates are shown in U. S. Patents 1,692,166 and 1,692,167.

The manner in which ties of the type to which this invention relates are used is well known and will not be described in greater detail than necessary for the purpose of explaining the present improvement.

When ties of the type to which this invention relates were first employed it was customary, after wrecking the form by first cutting the loops of the ties that encircle the vertical tie bars and then removing the sheathing, to cut the projecting ends of the ties flush with the concrete wall surface by means of suitable nippers.

The practice today is to cut the tie loops as usual, remove the sheathing and then break the tie wires by twisting or bending, either flush with the surface or a short distance within the concrete wall thus leaving the surface of the wall entirely free from sharp ends left by the clipping operation.

In order that the ties can be broken at any point either flush with the wall surface or a short distance within the wall the wire forming the loop must be nicked at the point where the break is desired, the wire will then usually break at such nicks.

Owing to the fact that concrete will adhere quite strongly to the clean metal tie surfaces the ties do not always break at the point where they have been nicked but sometimes a considerable distance within the concrete wall and in such cases frequently considerable quantities of concrete is broken loose during the tie trimming operation.

It has been found that if the ties are provided at each nick with a coating of non-drying paint or non-drying material which prevents the raw concrete from coming into direct contact with the clean metal surface of the tie adjacent the nicks, the wire of which the ties are made, can be twisted in the concrete and will always break at the nicks even when the nicks are so small that they do not appreciably affect the tensile strength of the wire.

It is the object of this invention to subject tie wires of the type above referred to, to a treatment that will prevent the concrete or other plastic from adhering to the tie surfaces at the points

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where they are provided with nicks, to thereby assure that the wires will break at the desired points.

In order to explain the invention so that it can be readily understood reference will now be had to the accompanying drawing in which the invention has been illustrated and in which:

Figure 1 is a vertical section through a typical concrete wall form showing the concrete form ties in place;

Figure 2 is a section, to a somewhat enlarged scale, taken on line 2—2, Figure 1;

Figure 3 is a section taken on line 3—3, Figure 2;

Figure 4 is a section, similar to the one shown in Figure 3, and shows the parts after the end loop has been broken off;

Figure 5 is a view to a greatly enlarged scale, showing the position of the break nicks, and the manner in which the material is protected from adhering to the concrete and the manner in which the adhesion preventing coating is protected against injury during shipment and handling.

Figure 6 is a section taken on line 6—6, Figure 5 and shows the two coatings that surround the wire at the point where it is nicked and adjacent to the nicks, and

Figure 7 is a section taken on line 7—7, Figure 5 and shows the single protective coating.

Referring now to the drawing, reference numerals 10 designating the sheathing of a concrete wall form, in the drawing the sheathing has been shown as formed from boards but other material such as plyboards may, of course, be used. The tie wires have been designated in their entirety by numeral 11 and the vertical tie bars by numeral 12 while the concrete has been designated by numeral 13.

It will be observed that the form tie has a central section comprising three wires twisted to form a cable. The ties comprise each a single length of wire provided at each end with a loop 14 for the reception of the tie bars 12; the ends of the wire terminate in hooks 15 of the shape generally used for latching doors and for gates and serve as stops for the sheathing, as shown in Figures 2 and 3. The form sheathing is provided with holes through which the loops extend. Tie bars 12 pass through the loops as shown in Figure 1 and positively prevent the form from spreading.

After the form has been built it is filled with concrete or some other plastic material in the usual way and left undisturbed until the con-

crete has set sufficiently to make it safe to remove the sheathing. The form is usually wrecked by first cutting the loops and removing the tie bars after which the sheathing is removed. When the sheathing has been removed the ends of the ties project beyond the surface. It has been the custom to cut the wires close to the outer surface of the wall by means of suitable nippers. After the ties have been cut the wall surface bristles with the sharp ends of wires which are objectionable.

The objections to cutting the wire and leaving many sharp points was soon recognized and resulted in the practice of nicking the two sides of the tie loops at points either exactly flush with the concrete wall surface or a short distance within the wall. Instead of cutting the wire with nippers it was then twisted and/or bent until it broke. The break would ordinarily occur at the nicks unless the hardened concrete which adhered to the clean metal surface of the ties prevented it. It was found that the concrete frequently covered the wire at both sides of the nicks and formed a strong bond with the wire and this prevented the twisting torque from being exerted at the point of the nicks. Attempts to break the wire usually resulted in breaking loose quantities of hardened concrete leaving a wall surface having an objectionable pitted appearance.

Applicant found that when the tie wires were coated or covered with a thick undrying paint like material over the nicked portion and to such a distance outwardly therefrom that concrete could not come in contact with any bare metal surface outwardly from the nicks; the wires would invariably break at the nicks even when these were some distance within the concrete. The coating prevents the concrete or other plastic from coming into contact with any bare wire surfaces outwardly of the nicks and the wire can therefore turn in the concrete and the twisting torque will be transmitted to the nicked parts and cause the wires to break there.

The non-drying paint should extend inwardly from the nicks a short distance only so that the concrete will hold the wire from turning on the inward side of the nicks. When the wire is thus protected from coming into direct contact with the concrete at any point outwardly of the nicks it will break at the nick even when this is positioned a considerable distance within the concrete. By the expedient explained above the nicks although very small will determine the exact point of breakage even when located within the concrete.

At this point it will be pointed out that word "inside" is used to indicate the direction towards the middle point of the tie and the word "outwardly" to designate the direction towards the loops or ends of the ties.

Ties are often shipped long distance and may not be used for weeks and even months after they are manufactured.

The coating must therefore be such that it will remain soft until used. Since form ties require much handling there is the ever present danger that the coating may be accidentally wiped off before use. There was also the objection that the workman may get his clothes soiled or his hands smeared by the soft paint.

To assure that the soft paint layer will not accidentally be wiped off and that it will not smear the hands of the workmen or their clothes it is necessary to cover the soft layer with a layer that will dry hard and smooth when exposed to the

air. There are many materials suitable for this purpose among which may be mentioned ordinary varnish, shellac, quick drying enamel, etc.

After the soft layer has been applied the ends of the ties are dipped in the varnish or other material to such a depth that the soft coating is completely submerged after which the ties are left undisturbed until the protective or seal coat has dried.

Referring now once more to the drawing the nicks have been designated by numeral 16, soft or non-drying paint by numeral 17 and the seal or protective cover has been designated by numeral 18. Coating 18 would not have to extend over the whole loop but since it can be most conveniently and cheaply applied by dipping the ends into the coating material it covers the entire loop. When another method has been developed the seal coat may be omitted from the bight.

Attention is called in particular to the fact that the nicks are on the inside of the loop wires instead of either on the upper or lower side. The reason for positioning the nicks in the plane of the loop is that during shipment and handling the loops are often subjected to bending forces and if the nicks were on the upper or lower sides the wires might break due to such bending by positioning the nicks in the plane of the loops the danger of starting breaks when the loop portions are bent is eliminated. The nicks have been shown on the inside of the loop but may be on the outside.

Our method is to place a minor scar or nick in the tie which does not destroy the strength of it in the least as far as the tensile strength is concerned. But relying almost wholly upon a non-hardening pliable coating which covers the tie from the nick to the face or surface of the wall. This distance may be from $\frac{1}{4}$ " to $1\frac{1}{2}$ " distant. Then by simply twisting the wire and since the concrete does not adhere or cause pressure upon the wire it will therefore twist off inside the wall at the minor scar or nick in the tie making it possible to pull out that portion of the tie and leave the rest of the tie unexposed in the wall.

There are many kinds of nonhardening pliable paint and plastics that may be used and as an example the following are mentioned. Asphalt emulsion solution soluble in water or oil, plastic prepared paint and certain types of prepared gum rubber paints.

There are, of course, other materials that can be used, the requirement being that they must prevent the concrete from adhering to the metal. Graphite is an excellent material and can be mixed with any of the other materials mentioned above. The second or seal coat is merely for protecting the plastic coat.

When such ties are used the nicks may be positioned an inch or more within the concrete and the wire will break at the nicks because that portion outside of the nicks is protected from the concrete by the plastic coating.

What is claimed as new is:

1. A form tie for use in connecting spaced sheathings for concrete mold forms, comprising a metal tie member adapted to connect the spaced sheathings and extend through openings in the sheathings, that part of the tie between the sheathings having a nick at the point where the tie is to be broken after the concrete has set and the sheathings removed, means for preventing concrete in plastic form from contacting the metal of the tie between the nick and the adjacent inner sheathing surface comprising, a

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coating of non-drying plastic material covering the nick and that part of the tie outwardly from the nick to the adjacent surface of the form sheathing, said coating forming a plastic layer that allows the part of the tie beyond the nick to be turned in the concrete and cause the tie to break at the nick, and a protective covering of varnish type material enclosing the plastic covering.

2. A form tie of the type terminating in elongated loops adapted to pass through openings in concrete form sheathing and to receive a tie bar located on the outside of the sheathing, in which the material forming the loop is provided with nicks at the points where the tie is to be broken after the concrete in the form has set and the sheathing removed, and in which that part of the tie from the nicks to the adjacent surface of the sheathing is covered with a plastic layer of non-hardening material which serves as a spacer between the concrete and the metallic surface of the tie outwardly from said nick, whereby, after the concrete has set and the form sheathing has been removed the tie can be broken at the nicks by applying a twisting force to the exposed end.

3. A concrete form tie in accordance with claim 2 in which the plastic layer is enclosed by a layer of varnish type material that hardens in contact

with air, said second layer sealing the first layer from contact with the air and serves also to guard the workman's hands from coming in contact with the plastic layer.

4. A tie for plastic forms of the type composed of a plurality of lengths of wire twisted together to form a cable having a loop at each end thereof, in which the wire forming the loop is nicked at the points where the loop is to be broken and in which the wire at the points where the nicks are located and outwardly therefrom is covered with a non-hardening plastic material that shields the metal surface from coming in contact with the surrounding molded plastic thereby preventing it from adhering to the portions of the wire loop outwardly from the nicks whereby a twisting force applied to the wire outwardly from the nicks will be transmitted to the nicks causing the wire to break at those points.

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References Cited in the file of this patent
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