Dec. 25, 1962 W. J. LUYBEN 3,069,743

CONCRETE FORM TIE

Filed July 1, 1960

Fig. 1

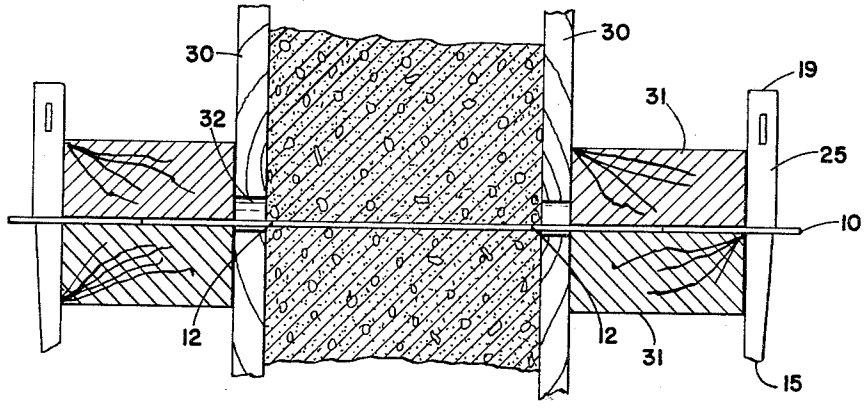
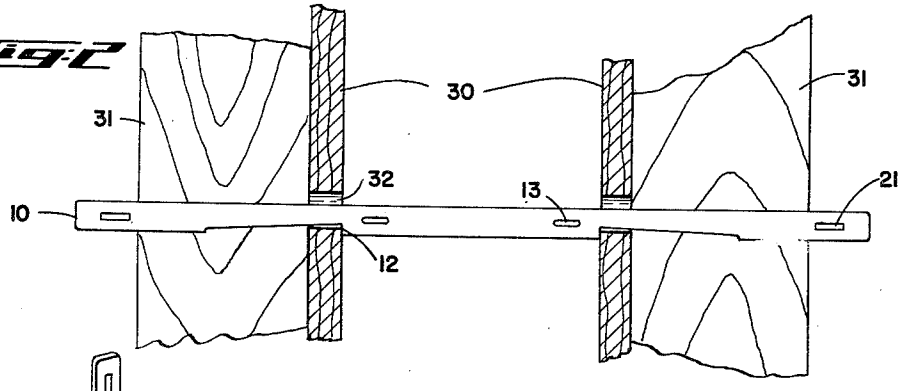


Fig. 2



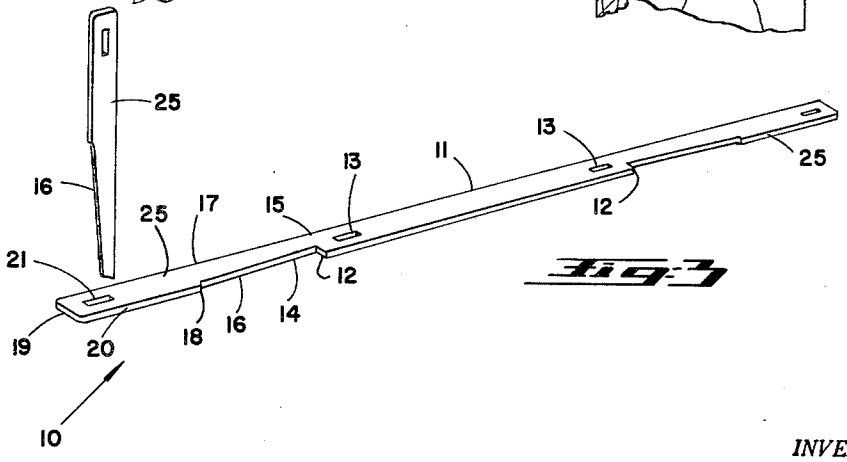


Fig. 3

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3,069,743

Patented Dec. 25, 1962

3,069,743

CONCRETE FORM TIE

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Filed July 1, 1960, Ser. No. 40,383
2 Claims. (Cl. 25—131)

This invention relates to improvements in ties used for maintaining the proper spacing of panels in concrete forms for walls and the like.

Such ties usually have opposite ends projecting through holes in the form panels and extending between pairs of closely spaced walers which are arranged to prevent spreading of the panels under the pressure of the concrete when the latter is poured into the wall space between the panels. The ends of the ties are equipped to receive special wedges engaging the outer surfaces of the walers or other stiffening members employed. The ties are also usually equipped with spacing elements to hold the form panels apart before the concrete is poured and it is common practice further to provide the ties with reduced neck portions whereby the ends of the ties may be broken off beneath the surface of the concrete after the concrete has hardened.

The provision of these various desirable features has made the presently available form ties a relatively expensive item in connection with the construction of concrete walls. The broken ends constitute a waste and the wedges themselves are such an item of expense that small contractors not regularly engaged in wall construction often rent them to save the purchase price.

The general object of the present invention is, therefore, to provide form ties and wedges of the type described which can be manufactured and sold at lower cost than conventional ties and wedges.

Other objects are to provide an improved form tie which incurs less waste for the contractor, to provide a form tie which eliminates the necessity for purchasing or renting wedges, and, specifically, to provide a form tie in which the broken ends themselves are utilized as wedges.

The present tie is so designed that each end which is broken off when the forms are stripped provides a wedge for use with a new set of form ties on a later job. Thus, after the first job, the contractor is automatically supplied with wedges from portions of the tie which had previously been considered as waste. This advantageous result is accomplished by tapering the end portions of the tie to wedge shape, the small end of the wedge forming the break point where the end is broken off when the forms are stripped. This eliminates the purchase or rental of wedges and reduces the total expense of the ties in a continuing operation.

The foregoing and other objects and advantages will become aparent and the invention will be better understood with reference to the following description of the preferred embodiment illustrated on the acocmpanying drawing. Various changes may be made, however, in the details of construction and all such modifications within the scope of the appended claims are included in the invention.

In the drawing:

FIGURE 1 is a vertical cross sectional view, showing the present tie in a concrete form after the wall has been poured;

FIGURE 2 is a sectional view on a horizontal plane, showing the form in the process of erection preparatory to receiving the concrete; and

FIGURE 3 is a perspective view of the present tie, showing how a broken end is used as a wedge.

Referring first to FIGURE 3, the present tie **10** comprises a flat metal bar having a center spreader portion

11 extending between a pair of outwardly facing shoulders **12**. The configuration of this center portion is not important except that it preferably includes some retention means to lock it in the concrete, such as openings **13**.

Each shoulder **12** constitutes one side of a notch **14** which reduces the cross section of the bar to provide a weakened break point **15** at the point of greatest depth of the notch which is at shoulder **12**. The other side of the notch is formed by a tapered edge **16** which extends for a considerable distance outwardly from shoulder **12** at a suitable wedging angle relative to the straight back edge **17**. The wedge surface preferably ends at a point **18** some distance from the end **19** to leave an end portion **20** of uniform width which, for convenience of manufacture, is the same width as center portion **11**. End portion **20** is equipped with a rectangular hole **21** having a length slightly less than the width of end portion **20** to receive the wedge **25**. Wedge **25**, it will be observed, is the end of another tie which has been broken off at the point **15**.

Referring now to FIGURE 2, the numeral **30** designates a pair of upright form panels between which concrete is to be poured to form a wall. These panels are stiffened and prevented from spreading apart by pairs of horizontal walers **31**. Round holes **32** are bored in the panels **30** between the walers **31** to receive the tie **10**. Shoulders **12** engage the inside surfaces of the panels to hold them apart a distance slightly less than the intended thickness of the wall. The ends of the tie project from between the walers **31** with the inside edges of holes **21** spaced slightly beyond the outside surface of the walers.

Wedges **25** inserted in the holes **21** prevent the spreading of the form panels when the concrete is poured, as shown in FIGURE 1, the distance between the inside edges of holes **21** determining the thickness of the wall. The pressure of the concrete against panels **30** forces walers **31** back against the wedges, spreading the panels **30** apart to a spacing slightly greater than the distance between shoulders **12**. This locates the break points **15** beneath the surface of the concrete so that no part of the metal tie projects from the finished wall after the ends have been broken off.

In stripping the form, wedges **25** are first removed and then the ends of the ties may be broken off through the holes **32** by bending them back and forth horizontally in the space between the walers **31**. The ties are preferably hardened, at least in the regions of the notches, to facilitate such breaking. When the ends of all the ties have thus been broken off, they offer no obstruction to the stripping of the forms. As many of the broken ends of the ties may be saved as may be necessary for future work. The present wedges also have the further advantage that they cannot rotate on the tie rods and become accidentally disengaged therefrom before the rods are tensioned by the pouring of the concrete, as frequently happens with certain conventional wedging arrangements.

In the illustrated embodiment, the panels **30** are plywood panels and the walers **31** are 2" x 4" lumber. The distance between abutment shoulder **12** and the inside end of hole **21** is sufficiently greater than the combined thickness of panel **30** and width of waler **31** to locate break point **15** under the surface of the concrete as above mentioned when green lumber is used for the walers. If the walers shrink from drying before the concrete is poured, the break points will be submerged to a slightly greater depth in the concrete and the wall will be slightly thicker whereby no objectionable dimensional variation occurs. It will be apparent that the present ties, in appropriate dimensions, may also be used in forms with vertical studs instead of horizontal walers and in forms without either

studs or walers. The present ties are not limited to wood form construction, however.

While the shape of the tie bar is susceptible to certain variations, the particular configuration of the preferred embodiment permits it to be stamped economically from flat strap or band stock. The present configuration also permits bars of different lengths for different wall thicknesses to be stamped from the same dies. This is accomplished by stamping each end in a separate operation. In this way, the length of the center portion **11** does not affect the stamping operation. This method entails no extra work because the stamping die may be made to form the ends of two different bars simultaneously. Thus, two stamping operations form two ties as would be the case if each tie were completely formed in a single stamping operation.

A desirable dimensional relationship to be observed is that the length of hole **21** should be equal to the width of the wedge at approximately its mid-point between its small end **15** and its large end **19** so that its back edge **17** will have a substantial bearing length on opposite sides of the tie bar in FIGURE 1.

Having now described my invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

1. A tie for concrete forms and the like comprising a flat strip of metal of straight edged rectangular cross-section having rectangular wedge engaging apertures adjacent each end; form engaging shoulders formed within the cross-section of the body of the strip, each shoulder facing outwardly toward its own adjacent end of the strip, the bottoms of said shoulders being joined to the full cross-section of the strip by outwardly directed bevels, the slope of said bevels being at a suitable wedging angle relative to a straight back edge, the width of the cross-section of said strip at said shoulders being less than the length of said wedge engaging apertures and said strip being frangible at said shoulders.

2. A tie for concrete forms and the like comprising a flat strip of metal of substantially rectangular cross-section having wedge engaging apertures adjacent each end; form engaging shoulders formed substantially within the cross-section of the body of the strip, each shoulder facing outwardly toward its own adjacent end of the strip, the bottoms of said shoulders being joined to the full cross-section of the strip by outwardly directed bevels, the slope of said bevels being at a suitable wedging angle relative to the opposite edges, the width of the cross-section of said strip at said shoulders being less than the length of said wedge engaging apertures and said strip being frangible at said shoulders.

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