April 2, 1940. M. E. KEMPER 2,195,928

TIE FOR CONCRETE FORMS

Filed Aug. 26, 1938

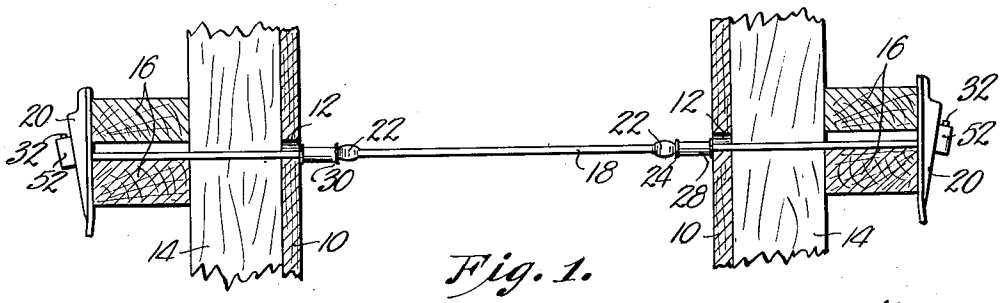


Fig. 1.

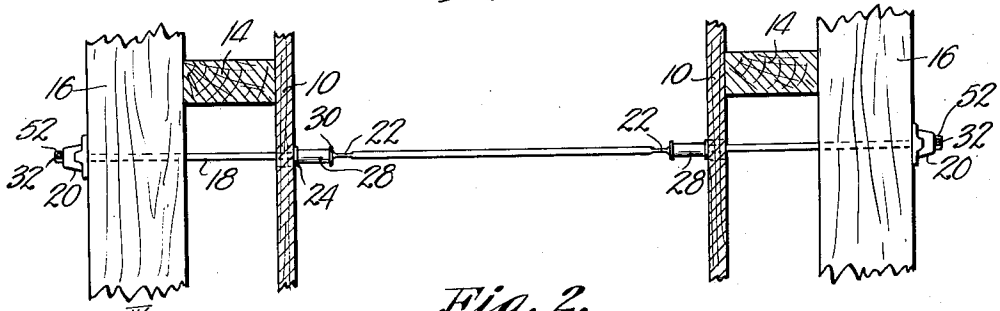


Fig. 2.

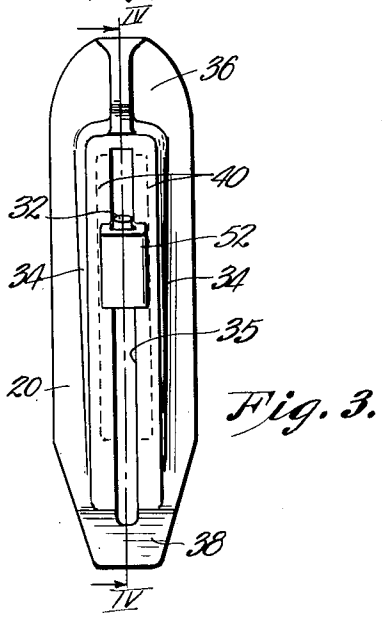


Fig. 3.

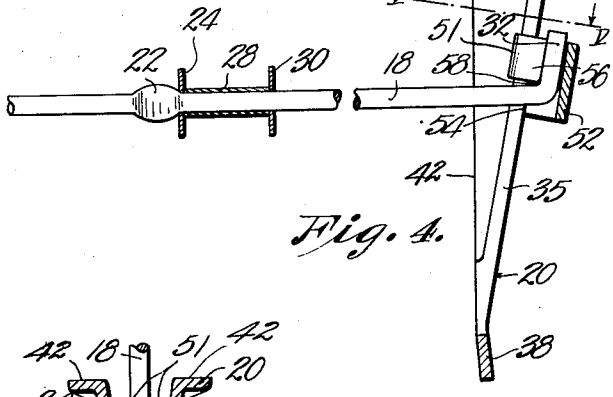


Fig. 4.

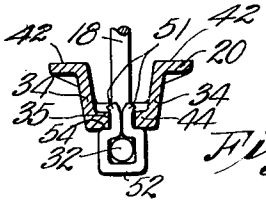


Fig. 5.

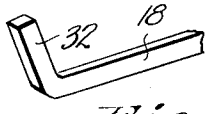


Fig. 7.

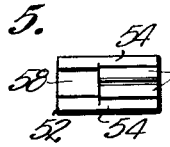


Fig. 6.

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TIE FOR CONCRETE FORMS

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6 Claims. (Cl. 24—126)

This invention relates to a form tie for concrete forms and is particularly directed to a rod tie and wedge clamp wherein the tie can be twisted off back of the form wall face without removing the forms.

The principal object of the present invention is the provision of a tie for concrete forms provided with a tie rod having a transversely angled end portion and a rider sleeve adapted to be fitted on the angled portion of said rod to serve as a bearing against a securing wedge, and also to serve to prevent a straightening out of said rod when a tensil pull is exerted longitudinally of said rod.

Other objects of this invention is the provision of a tie for concrete forms that is simple and economical in construction, easily and quickly applied and removed and adapted to be easily fabricated to accommodate any size of form lumber or wall width.

Reference will now be had to the drawing wherein:

Figure 1 is a vertical sectional view of a portion of a concrete form showing the invention applied thereto.

Fig. 2 is a plan view of the parts as seen from looking down on Fig. 1.

Fig. 3 is an elevation of the wedge and connecting parts.

Fig. 4 is a sectional view taken on line IV—IV of Fig. 3.

Fig. 5 is a sectional view taken on line V—V of Fig. 4.

Fig. 6 is an inside elevation of the rider sleeve.

Fig. 7 is a perspective view of a portion of a tie rod made of square material.

Referring to the drawing and particularly to Figs. 1 and 2, a portion of a form for a concrete wall is shown comprising the side walls 10 which usually extend in parallel spaced apart relation. These walls may be made of wooden or metal members. When using wood superposed, horizontally extending boards may be used or when it is desired to obtain a smooth concrete wall structure panels of laminated wood may be used, as shown. When the form walls are built with superposed boards or when the panels are wale high the tie rod can be laid in the joints of the boards or panels, however when the panels are longer than the wale heights the holes 12 are drilled through the panels to receive the tie rods. Positioned outside of and against said side walls is a stud 14 to which the walls are secured, usually by nailing. Horizontally disposed, spaced apart wales 16 are secured against studs 14 and are adapted to receive tie rods 18 therebetween, as shown in Fig. 1.

A wedge clamp 20 is adapted to bear against the outer faces of the wales 16 and secure the tie rod in a fixed position relative thereto. The tie rod 18 is preferably made of a material having a relatively high tensil strength and low tortional strength such as high carbon steel, to insure the form walls against spreading and at the same time to permit separation of the rod within the concrete wall by twisting.

In the construction of a concrete wall it is desirable to provide smooth wall surfaces with no metal parts exposed thereon, and it is therefore desirable to sever the tie rods within the wall structure, remove a portion of the rod and grout the small holes formed by the rods. This is accomplishd by flattening the rod 18 to form a bight 22 at a predetermined point spaced inwardly from the outer concrete wall surface. This bight 22 serves to weaken the tortional strength at this particular part of the rod without materially effecting the tensil strength, furthermore, the flattened portion when positioned in the hardened cement prevents rotating the rod during the twisting operation.

While a round tie rod or wire has been shown, it is very evident that square such as shown in Fig. 7, or other shaped wire might also be used. The position of the bight 22 relative to the inner surface of the form wall is determined by spacing means mounted on rod 18, which consists of a washer 24 resting against bight 22 and serving as an abutment for a sleeve 28 mounted on the rod and engaging a washer 30 which is adapted to rest against the inner surface of the form wall. When the concrete is poured, it will not contact that portion of the rod covered by the sleeve 28 thereby making it possible to rotate that portion of the rod located in the wall between the bight and the adjacent outer surface of the wall. This sleeve is preferably made of a material that is easily removed after the rod has been severed at the bight. A fibrous material has been found to be very suitable for the purpose. By using a cylindrical sleeve of sufficient strength any tie rod of any cross sectional shape may be fitted into the sleeve.

The outer end portions 32 of rod 18 are bent transversely at an angle to the body of the rod. For reason hereinafter set forth the angle of the portions 32 to the body of the rod is obtuse, but may be varied to any desired degree.

During the pouring of the concrete a great tensil strain is exerted on rod 18 and since the

end, angled portions 32 thereof are intended to take this strain, it becomes necessary to provide means whereby this angled portion will not straighten out to release the strain. For this purpose the following structure is provided. The wedge clamp 20 comprises a member longitudinally slotted at 35 to form parallel walls 34 joined together at their opposite ends by loops 36 and 38 respectively. Said walls 34 are provided with parallel track surfaces 40 which diverge outwardly and inwardly relative to the inner bearing surfaces 42 of said clamp. The surfaces 40 extend to the slot 35 and constitute the outer surface of the ledges 44 which extend inwardly from walls 34.

Referring to Figs. 3 and 4, it will be noted that the end portions 32 of rod 18 are fitted into a rider sleeve 52 having bearing surfaces 54 through its entire length which rest on track surfaces 42 while inturned flanges 56 extend through slot 35. These flanges 56 are slightly divergent at their extremities 51 to prevent removal of the sleeve 52 outwardly from the tracks 40, also they extend from one end of the sleeve to a point spaced apart from the other end thereof, thereby leaving a portion open at 58 to receive the rod 18. The action of this rider sleeve is as follows. When the parts are assembled and in the operative position as shown and described, and tensil strain is put on rod 18 by the pressure of the concrete, when poured, then the end portion will tend to return to its original position in alignment with the body of the bar. The rider sleeve 52 now comes into action and since the sleeve surfaces 54 are contacting tracks 40 and the line of pull of rod 18 is intermediate the ends of surfaces 54 there can be no possible longitudinal tilting of the sleeve, furthermore, the outer end of rod portion 32 cannot move relative to the sleeve. When so anchored the tensil pull on the rod cannot pull the rod from the socket and an excessive load will cause the rod to fracture rather than straighten.

It is apparent that with the structure shown the wedge clamp 20 with the rider sleeve 52 mounted for movement thereon, is adapted to receive the bent end portion of the tie rod 18 and hold it securely against a straightening action when a tensil strain is exerted on the tie rod when the soft cement is poured.

It will, of course, be understood, that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of applicant's invention, which, generally stated, consists in a device capable of carrying out the objects above set forth, in the novel parts and combinations of parts disclosed and defined in the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a tie for concrete forms, a wedge clamp having spaced apart, inclined tracks; a rider sleeve slidably mounted on said tracks; and a tie rod extending between said tracks, and an angled end portion of said tie rod positioned in said rider sleeve to secure the tie rod against a straightening action when a tensil strain is exerted thereon.

2. In a tie for concrete forms a wedge clamp having spaced apart inclined tracks; a rider sleeve secured to said wedge clamp and adapted to be adjusted along said tracks; and a tie rod having a transversely disposed, relatively short end portion positioned in said rider sleeve whereby the tie rod positioned to extend between said tracks is secured against straightening action when a tensil pull is exerted on the body portion of the tie rod.

3. In a tie for concrete forms a wedge clamp longitudinally slotted and having an inclined track at each side of said slot; a rider sleeve mounted for adjustment along said inclined tracks; and a tie rod having the end portion bent transversely to the body of the rod, said tie rod being positioned to extend through the slot of said wedge clamp with the transversely disposed end portion thereof positioned in said rider sleeve whereby said tie rod will retain its bent form when a pulling force is exerted longitudinally of the body of said tie rod.

4. In a tie for concrete forms a wedge clamp longitudinally slotted and having an inclined track at each side of said slot; an elongated rider sleeve having planar surfaces throughout its length contacting said tracks and having an integral portion thereof extended through said slot formed to prevent removal of the rider sleeve from said wedge clamp; and a tie rod having an end portion thereof positioned transversely of the body thereof, said rod being positioned to extend through said wedge clamp slot with its transverse end portion positioned in said sleeve whereby said rod will be securely held with relation to said wedge clamp when a pulling force is exerted longitudinally of the body of said rod.

5. In a tie for concrete forms a clamping member; a rider sleeve adjustably carried by said clamping member and having a tubular opening disposed at an acute angle to the face of the form wall; a tie rod having an end portion positioned transversely of the body of the rod and positioned in the tubular sleeve opening with the body of the rod disposed at substantially right angles to the face of the form wall.

6. In a tie for concrete forms a wedge clamp longitudinally slotted and having an inclined track at opposite sides of said slot; a rider sleeve having parallel planar surfaces throughout its length, resting on said tracks, and having flanges extending from one end portion of the sleeve to a point spaced apart from the other end thereof adapted to pass through said wedge slot, said sleeve also having its inner side portion open intermediate said flanges and the end of the sleeve; and a tie rod having an end portion thereof positioned transversely of the body of the tie rod, said rod being adapted to extend through the wedge clamp slot, and the open side of said sleeve with the transverse end portion of the rod positioned in said sleeve, whereby said rod will be securely held with relation to said wedge clamp when a pulling force is exerted longitudinally of the body of said rod.

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