Sept. 19, 1939. T. C. SCHENK 2,173,698

FORM TIE CLAMP

Filed Oct. 4, 1938

Fig. 1.

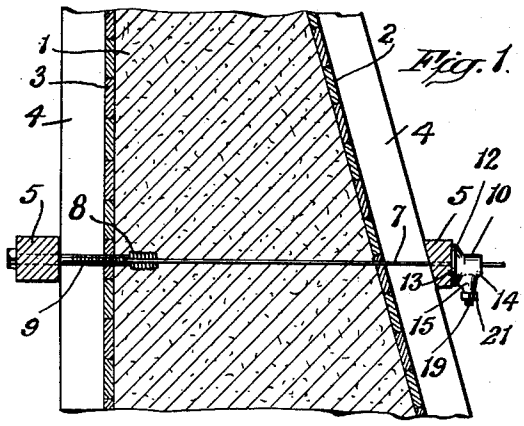


Fig. 2.

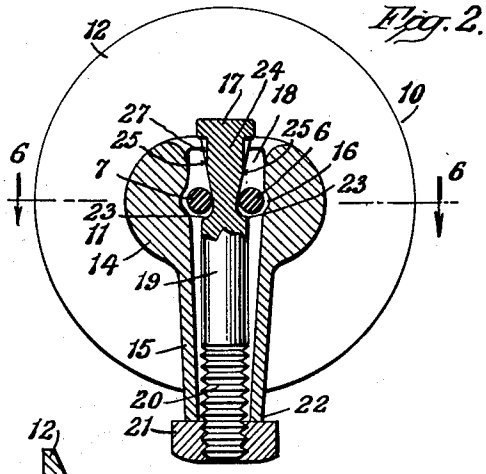


Fig. 3.

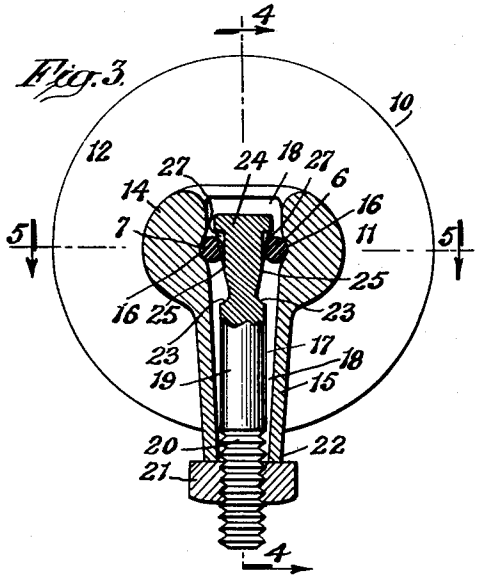


Fig. 4.

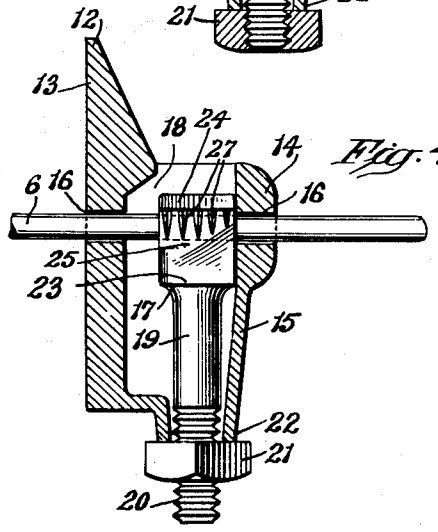


Fig. 5.

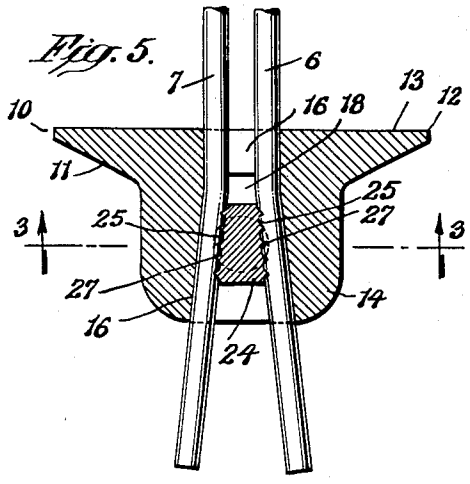
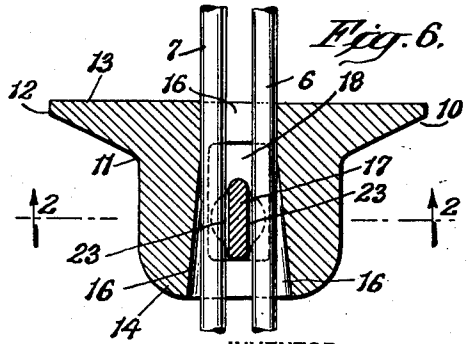


Fig. 6.



INVENTOR

Tamis C. Schenk

BY

Harry Razinsky

ATTORNEY

Patented Sept. 19, 1939

2,173,698

UNITED STATES PATENT OFFICE

2,173,698

FORM TIE CLAMP

Tamis C. Schenk, New York, N. Y., assignor to Richmond Screw Anchor Co., Inc., Brooklyn, N. Y., a corporation of New York

Application October 4, 1938, Serial No. 233,177

2 Claims. (Cl. 24—136)

This invention relates to form ties usually employed for holding together forms used in concrete work. The object of the invention is to provide means by which the operative length of the tie may be regulated for accommodation to concrete structures of various sizes or thicknesses.

More particularly, the invention contemplates the provision of a form tie consisting of several spaced parallel rods between which, at one end thereof, is a helix or spiral intended for the reception of a lag screw, the rods near their other ends receiving, at a selected position of adjustment thereon according to the width of the concrete structure to be formed, a clamp of novel construction through which the rods extend and which spreads the rods apart with a wedging action so that the clamp may be firmly, yet removably, fixed upon the rods at any selected position and thus the effective or operative length of the form tie be regulated accordingly.

In the accompanying drawing, wherein an embodiment of the invention is shown, Fig. 1 is a sectional view through a concrete structure, showing the improved form tie and clamp therefor in position; Fig. 2 is a sectional view through the clamp, the view being taken on the line 2—2 of Fig. 6, looking in the direction of the arrows; Fig. 3 is a sectional view similar to that of Fig. 2 except that the clamp is shown in the position of gripping and spreading the rods, the view being taken on the line 3—3 of Fig. 5, looking in the direction of the arrows; Fig. 4 is a sectional view on the line 4—4 of Fig. 3, looking in the direction of the arrows; Fig. 5 is a sectional view on the line 5—5 of Fig. 3, looking in the direction of the arrows; and Fig. 6 is a sectional view on the line 6—6 of Fig. 2, looking in the direction of the arrows.

In the drawing, 1 indicates the concrete structure which is formed by being poured between the form boards 2 and 3, the boards being secured to the vertical beams or uprights 4 reinforced by the horizontally extending beams 5. The form tie which extends between the form boards at the opposite sides of the form and holds the same in properly spaced relationship, consists of a pair of lengthy, spaced, parallel rods 6 and 7 between the ends of which is located a helix or spiral 8 attached between the rods by being welded or otherwise secured thereto. As will be seen at the left side of Fig. 1, the helix 8 is so located that it is disposed inwardly from the face of the concrete wall, and it is engaged by a lag screw 9 which is threaded into it to the required extent according to the desired spacing of the form boards.

Adapted for adjustable fitment upon the other ends of the rods 6 and 7 is a clamp 10. The clamp is adapted to be fitted upon the rods at any selected position according to the thickness of the concrete structure so that a standard length of form tie is adapted for use in the erection of concrete structures of different wall thicknesses. The clamp is provided with a housing or body portion 11 formed at one end with a disk portion 12 having a flat outer face 13 adapted to rest against the face of the beam 5 or other portion of the form structure. Extending rearwardly from the disk 12 is an integrally formed hub portion 14 having a downwardly extending part 15. Extending through the housing from the flat face 13 thereof through the outer end of the hub portion 14 is a slot 16 having its walls diverging toward the rear end of hub 14, as seen in Fig. 6, and through which the rods 6 and 7 extend and in which a wedging action is applied to the rods by means of a wedge member or spreader 17.

The wedge member or spreader 17 is adjusted vertically, or transversely of the slot 16, through a passage 18 which has a contracted open upper end at the top of the hub portion 14, and is open at its lower end at the bottom of the boss 22 on the portion 15 of the housing. Wedge member 17 is formed with a cylindrical shank 19, threaded at 20 for the reception of a nut 21 operative against the end of the boss 22. When the nut 21 is turned in the proper direction, it will act to draw the wedge down through passage 18 and apply a spreading action against the rods 6 and 7 to wedge them against the tapered walls of slot 16. At the upper end of the shank portion 19, the wedge is provided with the shoulders 23 in which the rods 6 and 7 initially rest before a tightening action is applied to the wedge by rotation of the nut 21, the parts being at this time in the positions shown in Figs. 2 and 6. Above the shoulders 23 is located the integrally formed flattened head 24, the side faces 25 of which are inclined as shown in the drawing so that they spread the rods 6 and 7 outwardly against the sides of the slot 16 when the wedge is drawn downwardly in the passage 18 by rotation of the nut 21. The surfaces 25 also converge toward the front of the wedge, or in other words in a direction toward the face 13 of the housing.

Near the upper end of the head 24, the side surfaces 25 of the wedge are each provided with a series of teeth 27, or are otherwise serrated or roughened so that when the wedge has been

drawn downwardly to its normal limit the teeth or roughened surfaces of the wedge will bite into and thus firmly engage a substantial portion of the rods 6 and 7, as illustrated in Fig. 5 and prevent any possibility of longitudinal slippage of the rods relative to the wedge.

Briefly, the operation of the device is as follows:

When the thickness of the concrete wall to be poured, and resultantly the spacing of the form boards, has been determined, the clamp is slid on the rods of a form tie to the required extent, and a lag screw inserted in the helix 8 and turned sufficiently therein to hold its position. At this time the wedge 17 is in an elevated or raised position, as shown in Fig. 2, with the rods 6 and 7 near or against the shoulder portions 23 of the wedge. The nut 21 is then turned to draw the head of the wedge down into the wider portion of the passage 18 and the inclined side surfaces 25 of the wedge acting against the rods spread the rods apart and bind or wedge them against the tapered sides of the slot 16, wedging them securely in the slot. The turning of the nut 21 is continued until the teeth 27 on the angular side surfaces 25 of the wedge securely grip and bite into the rods. At this time the rods are wedged securely in slot 16 and under normal working conditions, the clamp will not slip. The lag screw 9 may now be tightened up for the required extent, and the tie rod is then in position ready for the pouring of the concrete.

If an abnormal longitudinal strain or pull is, for any reason, imposed upon the rods 6 and 7, the clamp will not slip or lose its position, but instead a greater wedging action will be imposed by the wedge on the rods due to the forwardly tapered shape of the side surfaces 25 and the fact that the passage 18 in which the wedge is located is of sufficient size to permit the wedge to incline forwardly, or in a direction toward the flat face 13. When the wedge will so incline within the passage 18, it will impose a greater spreading action on the rods between which it is located. It will thus be apparent that the wedge is capable of applying a wedging action by its movement in two directions, namely, when it is drawn directly downwardly and by a forward tilting action within passage 18 under abnormal stress or longitudinal pull imposed on the rods.

After the concrete is poured and hardens sufficiently, the lag screw is removed, the projecting parts of the rods are cut off, the clamp is removed for further use and the aperture left by the lag screw is filled with concrete.

With the arrangement disclosed, it will be clear that a clamp is provided which is readily adjustable on the tie rods at any desired point thereon; which will enable tie rods of uniform length to be employed for the construction of concrete walls of various thicknesses, and which will firmly and positively hold its position on the rods under the most severe conditions of service.

What I claim is:

1. A clamp for concrete form ties comprising, a fastener having a base, said fastener being provided with openings arranged transversely of each other, one of said openings passing through the base, the walls defining the openings extending in convergent relation, in one instance toward the base and in the other instance transversely of said opening through the fastener, a clamping element loosely mounted within the fastener and extending longitudinally of one of said openings and transversely of the other, and means on said element to actuate the clamping element to gripping position.

2. A clamp for concrete form ties comprising, a fastener having a base, said fastener being provided with two openings arranged transversely of each other, one of said openings passing through the base, the walls defining the openings extending in convergent relation, in one instance in a direction toward the base and in the other instance, transversely of said opening through the fastener, a clamping element loosely mounted within the fastener and extending longitudinally of one of said openings and transversely of the other, said clamping element being provided with tapering surfaces for wedging a pair of rods in one of said openings and for applying increased wedging action when said clamping element is moved angularly with respect to the longitudinal axis of the opening through which it extends, and means on said clamping element to actuate it to gripping position.

TAMIS C. SCHENK.