Nov. 28, 1933. S. S. COLT 1,937,109

RETAINING MEANS FOR CONCRETE POURING FORMS

Filed June 30, 1933

Fig. 1

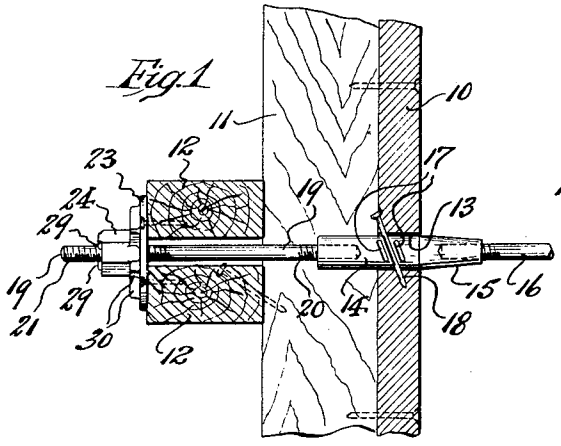


Fig. 3

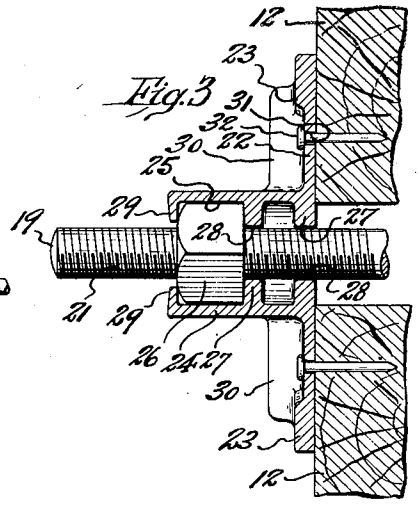


Fig. 2

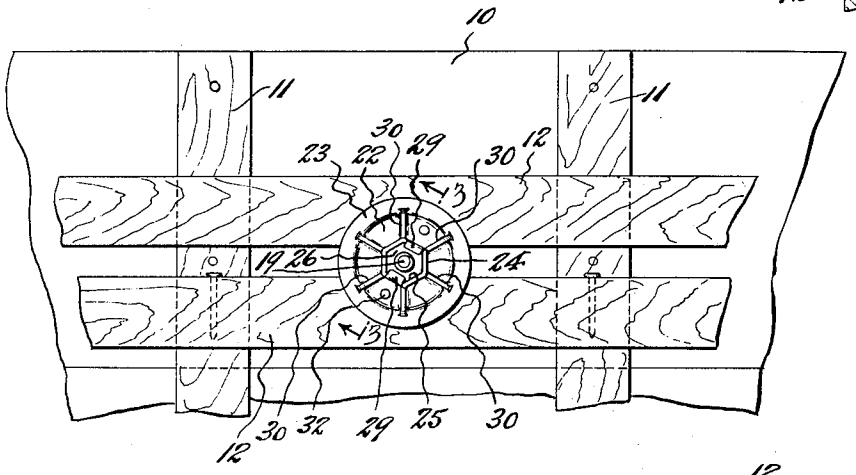


Fig. 4

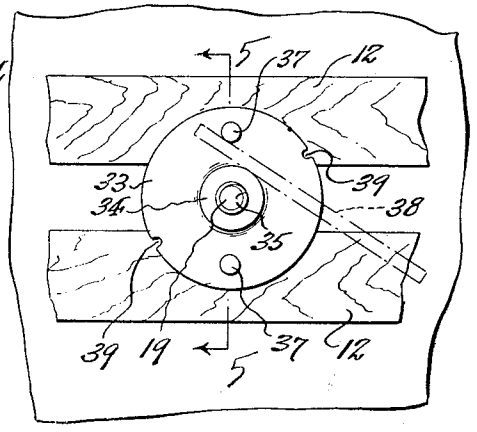
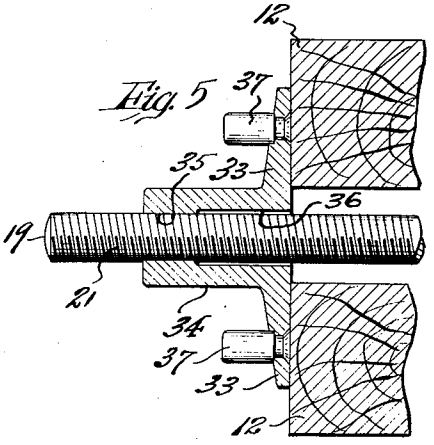


Fig. 5



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RETAINING MEANS FOR CONCRETE POURING FORMS

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7 Claims. (Cl. 25—131)

This invention relates to improvements in retaining means for concrete pouring forms; and the invention has reference, more particularly, to means for retaining spaced form walls or similar form parts in position and firmly braced subject to the pouring of concrete thereinto.

This invention has for its principal object to provide in combination with form supporting and tying means, a novel, inexpensive and efficient external keeper means for locking up the form supporting and tying means in assembled relation to the form wall structure; and the invention has for a more specific object to provide an external keeper means capable of cooperative use with ordinary machine nuts as applicable to the external end members of the form supporting and tying means; in this latter connection, the invention has for a further object to provide a keeper means wherein the base flange is strongly reenforced by a novel arrangement of reenforcing elements integral therewith, so that a minimum weight of metal is required to provide a keeper means of great strength and durability, with the result that the cost of production of the keeper means may be brought down to a minimum.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

Illustrative embodiments of this invention are shown in the accompanying drawing, in which:—

Fig. 1 is a fragmentary transverse section taken through an external wall of a concrete pouring form, and showing in one form, in combination with the supporting and tying means therefor, the novel external keeper means of this invention; Fig. 2 is an exterior face view of the same; and Fig. 3 is a fragmentary vertical section, taken on line 3—3 in Fig. 2, but drawn on an enlarged scale.

Fig. 4 is an exterior face view of a modified form of the external keeper means; and Fig. 5 is a vertical section thereof, taken on line 5—5 in Fig. 4, but drawn on a somewhat enlarged scale.

Similar characters of reference are employed in the aforesaid views, to indicate corresponding parts.

Referring first to Figs. 1 to 3 inclusive of the drawing, the reference character 10 indicates a form wall having applied to the exterior face thereof the usual uprights or battens 11 across which extend the horizontal walers 12, the latter being ordinarily arranged in pairs, the members of which are usually spaced apart one above the other.

Entered through an opening 13 provided in the form wall 10, is a tie-rod coupler 14 having its conical end 15 disposed to project into the form interior. Said conical end 15 is internally threaded to operatively engage the end of a tie-rod 16 which extends from the opposite wall, or any other part of the form, across the interior of the latter, and which serves to space the wall 10 relative to the opposite wall or other form part, so as to hold the same against both internal collapse and external displacement. One or both sides of said coupler 14 are provided with guide channels 17, preferably downwardly and inwardly inclined as shown, whereby fastening means 18, such as nails or staples, can be passed downwardly therethrough and driven into the form wall 10, thus not only holding the coupler 14 against inward or outward displacement relative to the form wall, but also holding said coupler 14 against turning about its axis once it is assembled in operative relation to the form wall and tie-rod.

The external locking means engageable with the coupler 14 ordinarily comprises a threaded link-rod or bolt-shank 19, which is threaded at its inner end, as at 20, to screw into the outer end portion of the coupler 14 to project exteriorly therefrom, and so as to extend outwardly between the walers 12. The outer end portion of said link-rod or bolt-shank 19 is provided with screw threads 21 engageable by the keeper means, which when connected therewith and screwed home will straddle and abut the outer faces of the walers 12 so as to tightly press home the latter, together with the uprights or battens 11, against the outer face of the form wall, thereby securely locking up the form parts and the supporting and tying means therefor in operative assembled relation ready to receive the pouring of concrete. In preferred form, the keeper means comprises an abutment flange or plate 22 of circular or any other desired peripheral shape, the marginal portions of which are thickened to provide a peripheral reenforcing portion 23. Centrally disposed to project from the outer face of said abutment flange or plate 22 is a hollow box 24 of polygonal cross sectional shape and open at its outer end. As shown this box 24 is of hexagonal shape to provide, at its outer end portion, a receiving chamber 25 to conform to and receive a hexagonal machine nut 26 adapted to be screwed upon the threads 21 at the outer end of the link-rod or bolt-shank 19. It will be understood that the box 24 and its chamber 25 may be shaped to conform to other shapes of machine nuts, such e. g. as square or octagonal shapes. At its inner end said box is provided interiorly with one or more transverse partitions 27 having smooth bore guide openings 28 to easily slide over the outer threaded end of the link-rod or bolt-shank 19 so as to guide the latter into quick and easy thread engaging relation to a nut 26 supported within the chamber 25 at the outer end of the box 24. To retain the nut 26 operatively related to the keeper member and seated and enclosed

within the holding chamber 25 thereof, the outer margins of the chamber walls are provided with a plurality of clinching lugs 29 which, after the nut 26 is entered in the holding chamber 25, are turned or bent inwardly and clinched over the outer face of nut 26, as shown; thus retaining the keeper member and nut in cooperative assembled relation. The outer contour of the box 24 conforms to that of the nut 26, and consequently when the keeper member and nut are engaged and retained together in assembled relation, the device may be easily and quickly applied to and turned relative to the link-rod or bolt-shank 19 so as to screw home thereon. To further reenforce the keeper member, and especially to distribute strains and stresses set up therein when screwing the device home onto the link-rod or bolt-shank 19, a plurality of radial reenforcing ribs 30 extend outwardly from the exterior of the box 24 over the outer face of the flange or plate 22 to the marginal reenforcing portion 23 of the latter, these ribs 30 being integrally cast in connection with these parts of the keeper device. The flange or plate 22 is provided at one or more points intermediate the box and its periphery with nail passing openings or perforations 31.

In the use of the keeper device, after the coupler 14 is in place and the link-rod or bolt-shank 19 connected therewith to project outwardly therefrom and between the walers 12, the keeper device with the machine nut assembled therewith, is applied to the end of the link-rod or bolt-shank 19. Owing to the provision of the smooth bore guide means at the inner end of the device, the end of the link-rod or bolt-shank 19 is led immediately into proper starting engagement with the internally threaded opening of the machine nut 26 carried in the chamber 25 of the box 24, thus avoiding fumbling and delay in screwing on the keeper member, and also avoiding any likelihood of crossing threads with risk of injury thereto. When the keeper means is screwed home by hand onto the link-rod or bolt-shank 19 so that its abutment flange or plate is brought into contact with the walers 12, a suitable wrench may be applied to the polygonal sides of the box 24 so as to forcibly turn home the keeper means into tight and secure abutment with exterior side structure of the form wall. In practice, the machine nut 26 fits somewhat loosely in the chamber 25 of the box 24 so that some slight allowance of play between the nut and the box is possible. This is of considerable importance since it allows the keeper device to accommodate itself to any inequalities in the surfaces of the walers without tendency to cant, bent or twist the link-rod, coupler or other parts of the supporting and tying means, and consequently relieves the latter parts from undue lateral stresses and strains. After the keeper device is set, any tendency to relax or back up on the link-rod or bolt-shank 19, and thus loosen from its desired holding or locking relation to the form wall structure, may be prevented by driving one or more nails 32 through the openings 31 of the abutment flange or plate 22 into the walers 12.

The novel keeper device, in the form above described, is very inexpensive, and may be used over and over again. It may be made of cast metal, and requires little or no machining, thread-cutting or like expensive operations, since it is adapted to utilize stock machine nuts. In the event of any injury to the nut per se, it is an easy and inexpensive matter to remove the same, and replace with a good nut. By virtue of the novel arrangement of reenforcing elements provided in connection with the flange and box of the device, the mass of metal required for the device may be reduced to a minimum without sacrifice of that strength and durability requisite for the purposes intended.

Referring to Figs. 4 and 5 of the drawing, I have shown a modified form of keeper means, which comprises an abutment flange or plate 33, having a centrally disposed outwardly projecting boss or barrel 34. At its outer end the bore of the barrel is internally threaded at 35 to directly screw onto the outer portion of the link-rod or bolt-shank 19. Leading into the barrel from its rear end is a smooth bore portion 36 which serves as a guide to direct the link-rod or bolt-shank end into starting relation to the internally threaded portion of the barrel. The outer contour of the barrel may be made of any shape desired. Riveted or otherwise secured to the abutment flange or plate 33 are one or more studs 37 spaced away from the exterior sides of the barrel. In applying this type of keeper device and thereupon tightening the same home on the link-rod or bolt shank 19, a lever member, as shown by broken lines at 33, may be inserted between a side of the barrel 34 and a stud 37, so as to be fulcrumed by the former into engagement with the latter, whereby leverage can be applied to turn the device on the link-rod or bolt-shank to tightly screw down the same against the walers 12. One or more peripheral notches 39 are provided in the marginal portions of the abutment flange or plate 33 through which holding nails (not shown) may be passed and driven into the walers to prevent accidental backing off of the keeper device once it is assembled in place.

It will be obvious that the outer end of the barrel 34 may be chambered to receive a machine nut, in the manner set forth in the first described structure, instead of providing the internal screw threads, as above mentioned.

It will also be obvious that the chambered nut receiving box 24 of the first described keeper means may be given a cylindrical or any other non-polygonal exterior conformation, and then studs, such as the studs 37 of the second described keeper means provided for cooperation therewith to receive actuating application of a lever for turning the device relative to the link-rod or bolt-shank 19.

Having thus described the invention, I claim:—

1. In combination with a form retaining means including a coupler and a threaded link-rod exteriorly projecting therefrom, a keeper means provided with an abutment flange and means to engage the threaded outer end of said link-rod, said keeper means having means to guide said link-rod end to the thread engaging means.

2. In combination with a form retaining means including a coupler and a threaded link-rod exteriorly projecting therefrom, a keeper means provided with an abutment flange and means to engage the threaded outer end of said link-rod, said keeper means having means to guide said link-rod end to the thread engaging means, and means engageable by a turning tool for turning said keeper means home on said link-rod.

3. In combination with a form retaining means including a coupler and a threaded link-rod exteriorly projecting therefrom, a keeper means comprising an abutment flange, a central box outwardly projecting from said flange and provided at its outer end with means to embrace a machine nut, a machine nut lodged in said embracing means, the latter being shaped to

conform to said nut whereby turning movement is transmitted therethrough to said nut, a guide means at the inner end of said box to guide said link-rod into thread engaging relation to said nut, and means to retain said nut against displacement from said box.

4. In combination with a form retaining means including a coupler and a threaded link-rod exteriorly projecting therefrom, a keeper means comprising an abutment flange, a central box outwardly projecting from said flange and provided at its outer end with means to embrace a machine nut, a machine nut lodged in said embracing means, the latter being shaped to conform to said nut whereby turning movement is transmitted therethrough to said nut, and means to retain said nut against displacement from said box.

5. In combination with a form retaining means including a coupler and a threaded link-rod exteriorly projecting therefrom, a keeper means comprising an abutment flange having a peripheral reenforcement, a central box integral with and outwardly projecting from said flange, said box having a polygonal exterior conformation and an open chamber at its outer end to conform to and receive a machine nut, a machine nut seated in said chamber, means at the outer end of said box to retain said nut against displacement from said chamber, and reenforcing ribs extending radially from said box and integrally with and across the outer side of said flange.

6. In combination with a form retaining means including a coupler and a threaded link-rod exteriorly projecting therefrom, a keeper means comprising an abutment flange having a peripheral reenforcement, a central box integral with and outwardly projecting from said flange, said box having a polygonal exterior conformation and an open chamber at its outer end to conform to and receive a machine nut, a machine nut seated in said chamber, means at the outer end of said box to retain said nut against displacement from said chamber, and reenforcing ribs extending radially from said box and integrally with and across the outer side of said flange, said flange having an opening for the passage of a fastening means therethrough and into a form wall structure.

7. In combination with a form retaining means including a coupler and a threaded link-rod exteriorly projecting therefrom, a keeper means comprising an abutment flange having a peripheral reenforcement, a central box integral with and outwardly projecting from said flange, said box having a polygonal exterior conformation and an open chamber at its outer end to conform to and receive a machine nut, a machine nut seated in said chamber, means at the outer end of said box to retain said nut against displacement from said chamber, and reenforcing ribs extending radially from said box and integrally with and across the outer side of said flange, said box having open guide means at its inner end to receive and guide the exterior threaded end of said link-rod into thread engaging relation to said nut.

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