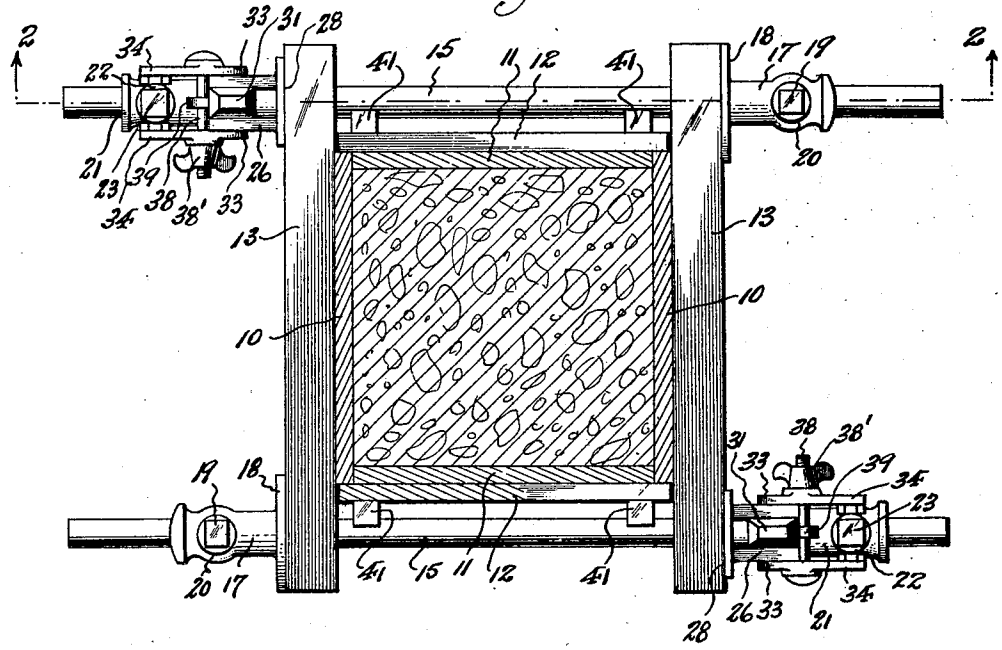
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MEANS FOR LOCKING UP CONCRETE POURING FORMS

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Fig. 1



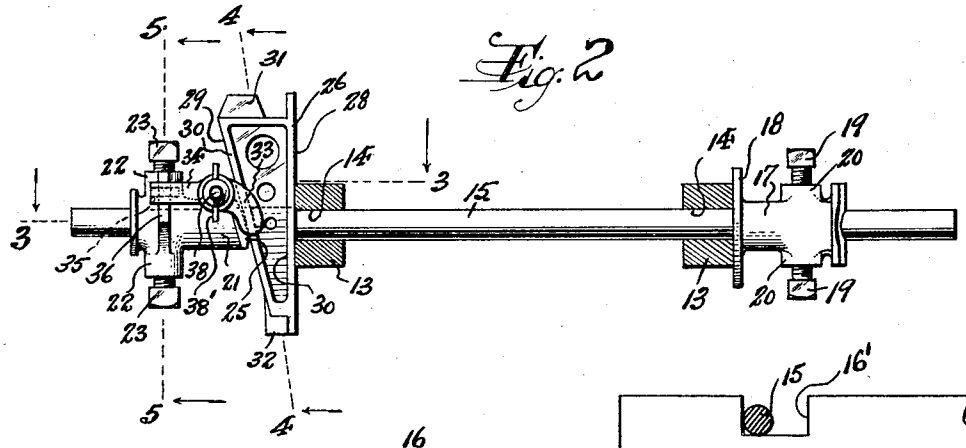


Fig. 2

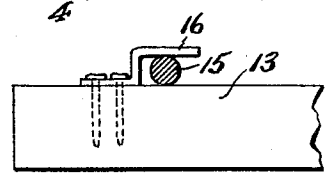


Fig. 6

Fig. 7

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Fig. 3

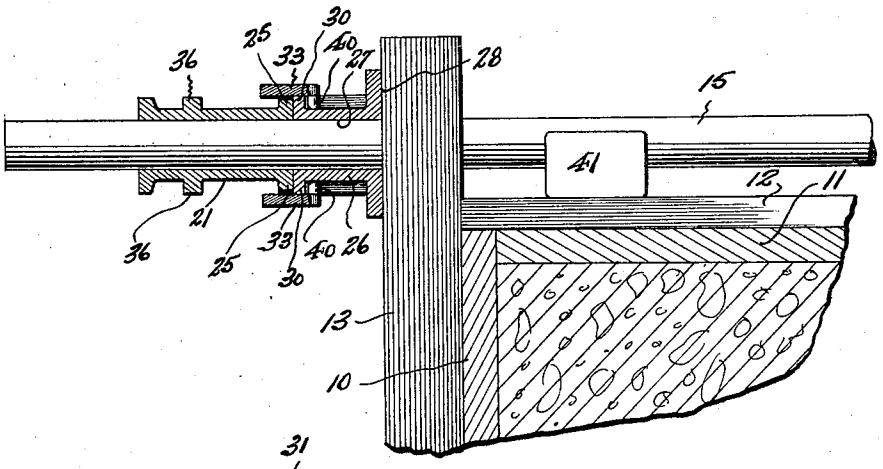


Fig. 4

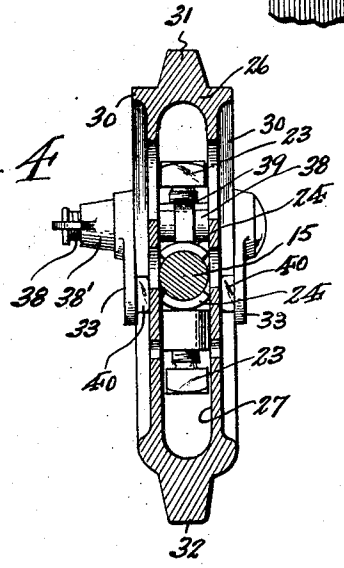
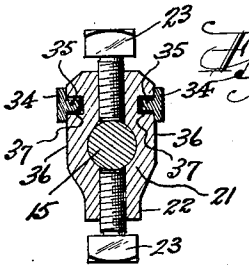


Fig. 5



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UNITED STATES PATENT OFFICE

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MEANS FOR LOCKING UP CONCRETE-POURING FORMS

Application filed July 11, 1928. Serial No. 291,855.

This device relates to adjustable clamping devices for retaining the walls of concrete pouring forms in desired assembled relation.

The invention has for its principal object to provide a novel arrangement of adjustable clamping devices in combination with tie-rods, said clamping devices including tightening wedges cooperatively arranged therewith, and further including means for securely retaining said tightening wedges against displacement from adjusted form locking position.

The invention has for a further object to provide, in a form locking apparatus, tie-rods having adjustable clamping devices including tightening wedges, said tie-rods being capable of extension through retaining baulks whereby the clamping devices and their wedges serve to draw said baulks into form wall retaining position.

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

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a plan view of one arrangement and construction of the adjustable clamping devices of this invention operatively related to assembled form walls, the latter being shown in horizontal section; Figure 2 is a vertical section on line 2—2 in Figure 1 but showing the clamping devices in elevation; Figure 3 is a fragmentary horizontal section taken on line 3—3 in Figure 2; Figure 4 is a vertical cross section taken on line 4—4 in Figure 2, but drawn on an enlarged scale; Figure 5 is another vertical cross section taken on line 5—5 in Figure 2 and also drawn on an enlarged scale; Figure 6 is a fragmentary detail view showing a modified method and means for operatively asociating the tie-rods and clamping devices with retaining baulks; and Figure 7 is a fragmentary detail view showing another modified method of associating the tie-rods with retaining baulks.

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

Referring to the drawings, the reference character 10 indicates one set of form walls and 11 indicates the other set of form walls which are arranged at right angles to the walls 10 to extend intermediate the same as shown; this arrangement of form walls is adapted to provide a mold or form of rectangular cross section, such as would be employed in pouring concrete piers, columns and similar structures. The form walls 11 are preferably provided with transverse battens 12 at suitable spaced intervals throughout their lengths.

To retain a rectangular form of the kind above mentioned in position, baulks 13, such as suitable lengths of 2x4 timbers, are arranged to extend transversely in abutting relation to the exterior sides of the form walls 10. These baulks 13 are of a length greater than the width of the form so that the free end portions of the same project beyond the corners of the form. Said free ends of the baulks 13 may be bored to provide openings 14 through which tie-rods 15 may be extended so as to pass exteriorly parallel to the form walls 11. An alternative to providing the baulk ends with the perforations or openings 14 is shown in Figure 6 of the drawings, and consists in providing clips 16 in connection with one of the horizontal faces of the baulks. Said clips are firmly secured in place and serve to receive the tie-rod which is arranged beneath the clip and between the same and the adjacent face of the baulk. Another alternative relation of tie-rod and baulk end is shown in Figure 7. In this latter arrangement the baulk 13 is provided with a notch 16′ in one of its horizontal faces to recive the tie-rod so that baulks may be easily and quickly assembled in place between the clamping means on the tie-rod and an adjacent form wall 10. Arranged on one end of each tie-rod is a sleeve or collar 17 having at its inner end an annular flange 18 to bear against the outer face of one baulk; this sleeve or collar 17 is provided with a pair of oppositely arranged set screws 19 which are threaded through internally threaded bosses 20 so as to bite against opposite sides of the tie-rod 15, where-

by the sleeve or collar is securely held on the tie-rod against displacement.

The tie-rods equiped with the sleeves or collars 17 are extended through the perforations or openings 14 of the baulk ends (or through the clips 16 or notches 16′ as may be desired) until the flange 18 abuts the adjacent baulk, with the free end of the tie-rod 15 extending beyond the outer face of the opposite baulk. Slidably mounted on said free end of the tie-rod 15 is an abutment block or collar 21, the same being provided adjacent to its outer end with internally threaded oppositely extended bosses 22 in which are engaged set screws 23. When the abutment block or collar 21 is set up toward the adjacent baulk 13, the set screws 23 are tightened so as to bite on opposite sides of the tie-rod 15, thus firmly and securely locking the abutment block or collar against outward displacement from the tie-rod 15. The inner end of said abutment block is provided with a forward extension 24 of reduced diameter and is further formed on each side of said reduced extension with laterally extending abutment shoulders 25. The reference character 26 indicates a wedge member which is designed for extension and movement between the abutment shoulders 25 and the face of the adjacent baulk 13. This wedge member 26 is so formed as to possess a longitudinal slot 27 through which the tie-rod 15 may extend; the arrangement being such that the side portions of the wedge straddle the tie-rod and the reduced extension 24 of the abutment block or collar 21, said reduced extension being preferably cut away at its sides, as shown more particularly in Figure 4 of the drawings, so that, when the wedge member is arranged in its operative position, it is free for vertical movement but is retained by the sides of the reduced extension 24 against rotative displacement. The vertical plane face 28 of the wedge is disposed to abut the outer face of the adjacent baulk 13, while the inclined plane face 29 of the wedge thrusts against the abutment shoulders 25 of the abutment block or collar 21. The said wedge member 26 is provided at its exterior side faces with countersunk depressions conforming generally to the peripheral shape of the wedge, whereby peripheral lateral flanges 30 are provided, the purposes of which will be subsequently disclosed. To permit driving of the wedge member 26, by means of blows of a hammer or other suitable striking instrument, and in such manner as not to injure or deform the wedge, the latter is provided at its wide end with a striking anvil or boss 31 which is capable of receiving and withstanding blows applied to the wedge when driving the same home to tightened position, as will be subsequently more fully explained. In like manner, a striking boss or anvil 32 is provided at the lower end of the wedge which receives the blows applied thereto when releasing the wedge from tightened position.

A novel means is provided in connected relation to the abutment block or collar 21 and arranged to cooperate with the wedge member 26 for the purpose of gripping and locking the wedge to hold the same in tightened form locking position. This means comprises a pair of jaw plates 33 having tail pieces 34 provided on their inner faces with longitudinal fins 35. Provided on opposite sides of the abutment block or collar 21 are vertical ribs 36 having notches 37 therein to receive the fins 35 of said tail pieces 34, all whereby said jaw plates 33 are retained against displacement from assembled relation to the abutment block or collar 21. Extending through the jaw plates 33 is a bolt 38 which also passes through a perforate ear or lug 39 integrally formed on the upper side of said abutment block or collar 21. The free threaded end of the bolt 38 is provided with a wing-nut 38′ which, when tightened, serves to draw the jaw plates 33 toward one another and into active gripping position. Said jaw plates extend over the peripheral flanges 30 of the wedge member 26 and are provided at their extremities with inwardly and laterally projecting gripping spurs 40 which are adapted to engage the depressed side faces of the wedge member within the peripheral flanges 30.

When the tie-rods with their clamping devices have been assembled in connection with laterally opposed ends of the baulks 13, so that the assembled parts embrace and encircle the form walls as shown in Figure 1, the thus assembled devices may be quickly brought into tightened holding or locking engagement with the form walls by driving down the wedge members 26. To effect this operation the jaw plates 33 are released by loosening the wing-nut 38′ whereupon the wedge member 26 is driven downwardly by blows struck upon the striking boss or anvil 31. As the wedge moves downwardly it trusts against the shoulders 25 of the thrust block or collar 21 and consequently tends to draw the rod outwardly whereby the sleeve or collar 17 at the opposite end of the tie-rod is pulled tightly up against the adjacent baulk 13, thereby in turn pulling the baulk firmly toward and against the adjacent form wall. At the same time the thrust of the wedge is transmitted to the other baulk 13 upon which it impinges, so that that baulk is thrust inwardly and tightly against the adjacent opposite side of the form walls. When the wedge has been driven home to the desired degree of tightness, the operator merely tightens up the wing-nut 38′ whereby the jaw plates, which straddle the wedge member 26, are drawn toward one another so that their gripping spurs 40 are caused to bind or bite tightly against opposite sides of the wedge member 26, thus

securely locking the wedge member against upward displacement from its desired tightened condition. It will thus be apparent that, after both tie-rods with their clamping and wedge tightening devices have been set to operative holding position, the baulks 13 will be securely held in embracing relation to the form walls so that the latter are efficiently retained against any possible displacement when pouring concrete into the form. To further assure the proper disposition and retention of the form walls 11 against a possible loosening, wedges 41 of either wood or metal may be driven between the tie-rods 15 and the battens 12 of said form walls 11, as shown more especially in Figure 1 of the drawings.

From the above description it will be obvious that the present invention provides a very simple and easily manipulated form clamping mechanism which comprises a minimum number of parts, but which, owing to the possibility of utilizing wedges in the tightening operations, is capable of the most careful and accurate adjustment for holding or locking the form walls in assembled relation one to the other.

Another advantage of the construction which affords considerable convenience in use is that not only do the jaw plates with their gripping spurs adequately serve to retain the wedges against loosening once they have been set up in desired tightening position, but also these jaw plates, when slackened sufficiently, permit movement of the wedges for loosening or releasing the same while nevertheless holding the wedges in assembled relation to the abutment block or collar 21, so that the same cannot be lost when the form clamping device is dismantled and carried around from place to place. This latter advantage is due to the fact that the gripping spurs engage the depressed side faces of the wedge within the limits of the surrounding peripheral flanges 30 whereby the latter are permitted to act as keepers for retaining the wedge against separation from the abutment block or collar 21.

I am aware that many changes may be made in the above-described structures as well as in the details of the construction of the same, without departing from the scope of this invention as described in the foregoing specification, and as defined in the appended claims. Hence, I do not limit my present invention to the exact arrangements and combinations of the several devices and parts as set forth in the foregoing specification, nor do I confine myself to the exact details of the construction of said parts as illustrated in the accompanying drawings.

I claim:—

1. In a form locking apparatus, the combination with a tie-rod, of an abutment block slidably adjustable thereon, means for retaining said abutment block in adjusted fixed relation to said tie-rod, a wedge member slidable relative to said abutment block, and an independent releasable means carried by said abutment block and cooperative with said wedge member to lock the latter in operative form clamping position.

2. In a form locking apparatus, the combination with a tie-rod to span the form, an anchoring means on one end of said tie-rod and operative at one side of the form, an abutment block on the opposite end of said tie-rod, means to retain said abutment block in adjusted fixed relation to said tie-rod, a wedge member slidable against said abutment block and operative at the opposite side of the form, and an independent releasable means carried by said abutment block and cooperative with said wedge member to retain the latter in operative form locking position.

3. In a form locking apparatus, the combination with a tie-rod to span the form, an anchoring means on one end of said tie-rod and operative at one side of the form, an abutment block on the opposite end of said tie-rod, means to retain said abutment block in adjusted fixed relation to said tie-rod, a wedge member slidable against said abutment block and operative at the opposite side of the form, and means carried by said abutment block and manipulatable to selectively hold said wedge member in either movable or fixed relation to said abutment block.

4. In a form locking apparatus, the combination with a tie-rod of an abutment block slidable thereon, means for fixing said abutment block immovably on said tie-rod, a wedge member transversely movable relative to said tie-rod and slidably impinging the inner end of said abutment block, jaw-plates adapted to embrace the sides of said wedge member, means for moving said jaw-plates toward one another to grippingly engage their free ends with said wedge-member, and means for retaining said jaw-plates in assembled relation to said abutment block.

5. In a form locking apparatus, the combination with a tie-rod of an abutment block slidable thereon, means for fixing said abutment block immovably on said tie-rod, a wedge member having a longitudinal slot through which the tie-rod extends whereby said wedge member is movably arranged to impinge the inner end of said abutment block, said wedge member having depressed side faces to provide keeper flanges about the peripheries thereof, jaw-plates adapted to embrace the sides of said wedge-member, said jaw-plates having laterally projecting gripping spurs to impinge the sides of said wedge-member within the limits of said keeper flanges, means for moving said jaw-plates toward one another to operatively engage said gripping spurs with the wedge member, and means for retaining said jaw-plates

in assembled relation to said abutment block.

6. In a form locking apparatus, transversely disposed baulks to abut opposite sides of a form, tie-rods, means for engaging said tie-rods respectively with laterally opposed ends of said baulks for extension therebetween, an anchoring means on one end of each tie-rod to abut one baulk, an abutment block on the opposite end of each tie-rod, means for fixing said abutment blocks immovably on said tie-rods, a wedge member slidable against each abutment block to operatively engage the adjacent baulk, and an independent releasable means carried by said abutment blocks and cooperative with said wedge members associated therewith to retain the latter in operative tightened position.

7. In a form locking apparatus, transversely disposed baulks to abut opposite sides of a form, tie-rods, means for engaging said tie-rods respectively with laterally opposed ends of said baulks for extension therebetween, an anchoring means on one end of each tie-rod to abut one baulk, an abutment block on the opposite end of each tie-rod, means for fixing said abutment blocks immovably on said tie-rods, a wedge member slidable against each abutment block to operatively engage the adjacent baulk, jaw-plates adapted to embrace the sides of said wedge members, means for moving said jaw-plates toward one another to grippingly engage their free ends with said wedge members, and means for retaining said jaw-plates in assembled relation to the abutment blocks with which said wedge members are associated.

8. In a form locking apparatus, transversely disposed baulks to abut opposite sides of a form, tie-rods, means for engaging said tie-rods respectively with laterally opposed ends of said baulks for extension therebetween, an anchoring means on one end of each tie-rod to abut one baulk, an abutment block on the opposite end of each tie-rod, means for fixing said abutment blocks immovably on said tie-rods, a wedge member slidable against each abutment block to operatively engage the adjacent baulk, jaw-plates adapted to embrace the sides of said wedge-members, means for moving said jaw-plates toward one another to grippingly engage their free ends with said wedge members, means for retaining said jaw-plates in assembled relation to the abutment blocks with which said wedge members are associated, and separable wedge devices for insertion between said tie-rods and adjacent form walls.

9. In a form locking apparatus, transversely disposed baulks to abut opposite sides of a form, tie-rods, means for engaging said tie-rods respectively with laterally opposed ends of said baulks for extension therebetween, an anchoring means on one end of each tie-rod to abut one baulk, an abutment block on the opposite end of each tie-rod, means for fixing said abutment blocks immovably on said tie-rods, a wedge member slidable against each abutment block to operatively engage the adjacent baulk, said wedge members having depressed side faces to provide keeper flanges about the peripheries thereof, jaw-plates adapted to embrace the sides of said wedge members, said jaw-plates having laterally projecting gripping spurs to impinge the sides of said wedge members within the limits of said keeper flanges, means for moving said jaw-plates toward one another to operatively engage said gripping spurs with the wedge members, and means for retaining said jaw-plates in assembled relation to said abutment blocks.

10. In a form locking apparatus, transversely disposed baulks to abut opposite sides of a form, tie-rods, means for engaging said tie-rods respectively with laterally opposed ends of said baulks for extension therebetween, an anchoring means on one end of each tie-rod to abut one baulk, an abutment block on the opposite end of each tie-rod, means for fixing said abutment blocks immovably on said tie-rods, a wedge member slidable against each abutment block to operatively engage the adjacent baulk, said wedge members having depressed side faces to provide keeper flanges about the peripheries thereof, jaw-plates adapted to embrace the sides of said wedge members, said jaw-plates having laterally projecting gripping spurs to impinge the sides of said wedge members within the limits of said keeper flanges, means for moving said jaw-plates toward one another to operatively engage said gripping spurs with the wedge members, means for retaining said jaw-plates in assembled relation to said abutment blocks, and separable wedge devices for insertion between said tie-rods and adjacent form walls.

In testimony that I claim the invention set forth above I have hereunto set my hand this 7th day of July, 1928.

SAMUEL S. COLT.