

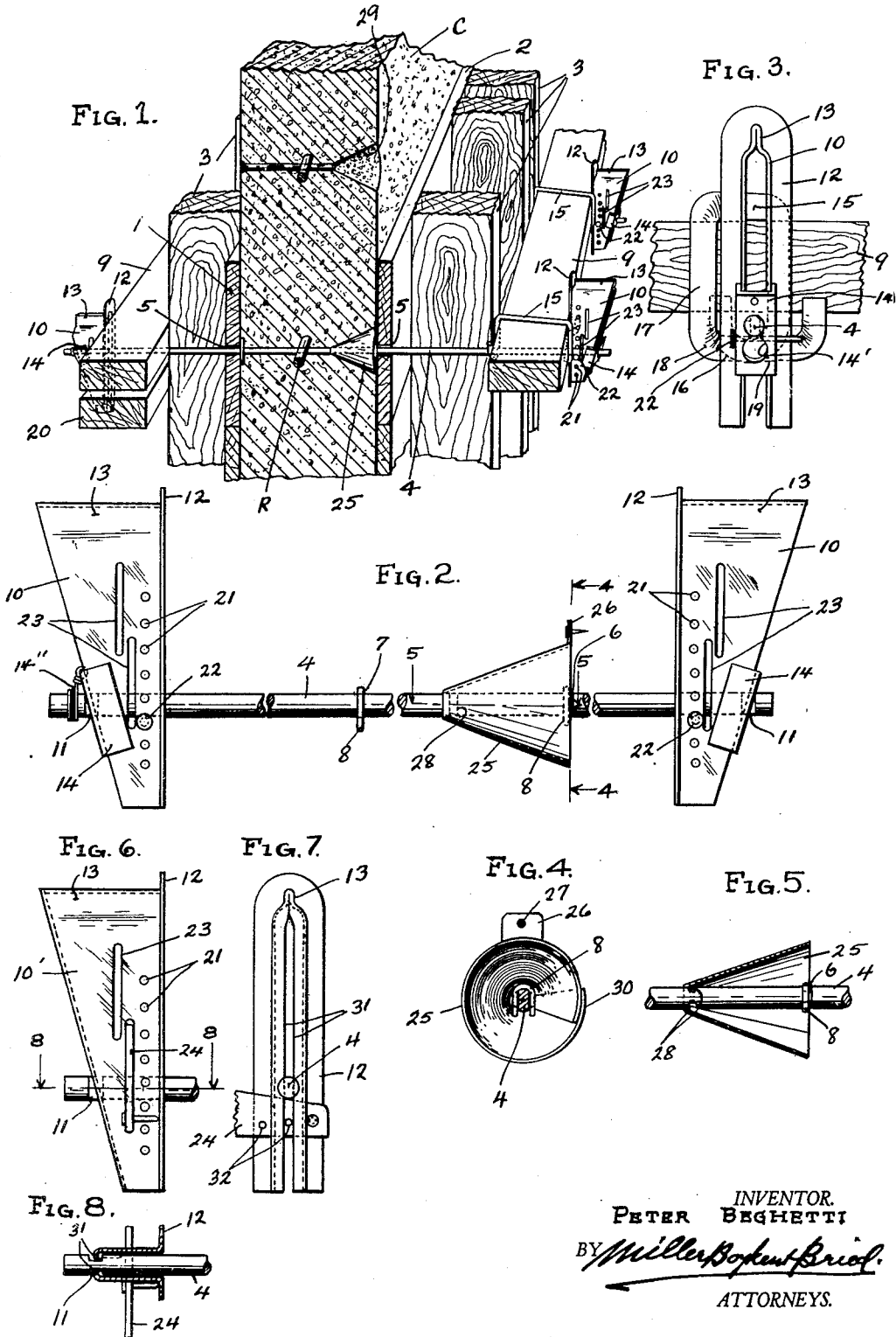
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SPACER AND TIE FOR CONCRETE WALL FORMS

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SPACER AND TIE FOR CONCRETE WALL FORMS

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This invention relates to mold clamps as used for holding together the sides of molds or forms for concrete walls in buildings or columns, etc.

5 The objects of the invention are to provide a simple clamp for properly spacing and retaining in position the sides of the forms or molds as set up for receiving wet mixed concrete or cement in the building of concrete
10 walls, columns, etc., which mold clamp is easily used in ordinary form construction and quickly removed when desired.

Other objects will appear in the following description.

15 In the drawing accompanying this application

Fig. 1 is a perspective sectional view showing a concrete wall and the wall forms held in place with my invention.

20 Fig. 2 is an enlarged assembled side view of my device without the mold forms and with the tie broken in length to accommodate the view to the sheet.

Fig. 3 is an end view of Fig. 2, showing one of the members of the form in place, and with a special device supporting the tie rod.

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 2.

Fig. 5 is a vertical section taken longitudinally through the device of Fig. 4.

Fig. 6 is a side view of one of my wedge clamps with a special locking and tightening wedge in place.

Fig. 7 is an end view of Fig. 6.

Fig. 8 is a sectional view taken along the line 8—8 of Fig. 6.

Reference numeral 14'' describes the wire bearing that numeral as set forth on page 6 of the specification, line numbered 14.

40 Forms as used in pouring concrete walls comprise two walls formed of horizontally extending boards supported against rows of studding, the clear sides of the walls are faced toward each other and separated the
45 width of the desired concrete wall by spacers, such as pieces of iron of uniform length. The walls of the form are held in this spaced relation, or tied together by wires running across the space to be filled with concrete and attached at their ends to the studding.

After the concrete is poured and hardened, the ends of the wires are untwisted from the studding, the boards are removed, and the wires are clipped off adjacent the faces of the concrete wall.

55 The threading of the wires through the boards of the forms, the placing of the spacers, the twisting of the wires around the studding is tedious, and the concrete wall when finished is not always satisfactory. 60 The ends of the mold retaining wires as well as the spacing rods are exposed to the elements on the outside of the wall and sometimes permit the entrance moisture which follows along the rods to the interior surface of the wall, also causes rust spots to appear on the outer surface.

My invention eliminates the objections noted and provides improved means for setting up the molds or forms, insures the proper spacing of the form sides, is quickly removed after the concrete walls are set, and provides for sealing with cement over the ends of wire or rods on the outer side of the building or on either side if desired.

75 In the drawing the mold or form for the concrete wall C comprises a wall 1 of boards or other sheet material at the inside of the building and a similarly formed wall 2 at the outside of the building wall. The boards of the walls are supported on rows of studding 3. The proper spacing of the form walls 1 and 2 is accomplished by means of light metal rods 4 running transversely
80 across the form and extending through openings 5 in the walls to a distance beyond the studding on either side thereof.

85 The rods 4 are of uniform length and are circumferentially grooved or transversely notched on opposite sides thereof at points equidistant from the ends as at 6 and 7, the notches being spaced from each other along the rod the desired thickness of the concrete wall to be constructed. Keepers are provided to slip into the notches, here shown as a pair of U-shaped wires, or staple 8 of fairly heavy stock for straddling the rods 4 at grooves 6 and 7, the legs of the staples 8 being adapted to fit into the grooves on either side of the rod thus insuring against
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any displacement of the staples along the rod.

In setting up the mold forms the rods 4 are thrust through openings 5 in the form walls 1 and 2, and the walls are adjusted from each other so that the grooves 6 and 7 on the bar are between the two walls. The keepers 8 are then slipped into place in grooves 6 and 7 respectively and the walls brought together so as to abut the keepers thus positioned, the holes 5 in the walls being of a size to admit the passage of rods 4 only, the keepers projecting around the rods to obstruct further inward movement of the walls. It will be seen that with uniform spacing of the grooves 6 and 7 and the consequent uniform spacing of the keepers 8, the form walls when brought inwardly against the keepers will also be uniformly spaced from each other.

In order to clamp the walls inwardly against the keepers 8, comparatively light beams 9, such as is used for studding, are placed horizontally against the outer edges of the vertical studding 3 to lie upon the horizontal aligned ends of the rods 4 which extend outwardly on either side of the walls 1 and 2. The beam members 9 are tightly drawn toward one another by means of special wedge clamps 10 adapted to detachably engage the opposite ends of the rods 4 and thereby force the mold walls tightly against the spaced keepers which embrace the rod 4 as described.

The special wedge clamps for forcing inward against the transversely extending beams 9 comprises each a pair of opposed plates 10 spaced from each other about the thickness of rod 4, said plates being formed by bending a piece of comparatively heavy sheet metal on itself, the point of the wedge being at the open end of the plates. Around the edge of the wedge portions is an outwardly extending flange as at 12. The connecting edge of the plates forming the wide end of the wedge is tightly pinched together as at 13 all along the bend and for a short distance toward the opposite narrow end of the wedge to form a substantially solid edge to withstand the pounding of a hammer or other instrument for driving the wedge in place.

The wedge clamps 10 are held in place on the ends of the rods 4 by means of grooves 11 in the sides of the rod ends, formed similarly to the notches 6 and 7 and in which outer stop plates 14 are positioned.

In building up the wall forms or molds, after the rods are in place and the cross beams 9 laid on the rods 4 against the outer edges of the studding 3 on the wedge clamps 10, points downward, are slipped over the ends of the rods, the rod passing between the plates of the wedge. The flange 12 of the wedge is faced against the beam 9 to prevent the edge of the wedge from cutting into the beam. In

this position, the grooves 11 on the ends of the rods are almost even with the inclined edges of the wedge.

The stop plates 14 are preferably short channel-shaped pieces of metal 14 each having a key-hole slot 14' formed in the connecting web. The key slot is adapted to pass over the rod 4 through the large part of the opening to the grooves 11, where the narrower portion is engaged with the notches 11 to thereby provide an outer stop or abutment against which the wedge can work.

The legs of the channel piece 14 are spaced to receive the inclined edge of the wedge as shown in Fig. 2.

From the above description, with all the members of the mold form and clamping members in place, it will be seen that the wedge clamp 10, straddling the rod 4 will draw the mold walls 1 and 2, studding 3 and beam 9 tightly together upon its being driven downward by pounding on the pinched edge 13.

In order to insure against bending the rod 4 from a point adjacent the beam 9 when the wedge clamp 10 is tightened, I secure the beam and the rod together by a specially shaped retaining bracket 15 formed of a rod and provided with a hook 16 at one end adapted to engage the rod 4 adjacent the edge of the beam which lies against the studding 3, the rod 15 extending upward from the hook portion 16 and over the top of the beam 9 and downward at 17 adjacent the perpendicular flange 12 of clamp 10 where the rod turns under the beam 9 at 18 and then extends longitudinally therewith and under the rod 4 as at 19, being brought forward so as to clear the flange 12 of wedge clamp 10, where it turns upward for a short distance parallel to the downward run 17 thereof.

It will be seen from Fig. 1, that the retaining bracket 15 as described, is shown on the right-hand side only of the form or mold. On the left side is shown a beam 20 similar to beam 9, extending beneath the rods. The flange 12 of clamp 10 engages against the outer edge of both beams.

While either arrangement may be used on both sides of the mold when reinforcing bars, as at R are used, it is desirable that the rods 4 be assembled at one end with the channel piece retained thereon by a wire as indicated at 14' and just retainably inserted at the other end in the openings 5 of the wall 1, the reinforcing steel is laid on the rods and the rods are pulled through, then the clamps 10 with channel pieces 14 are assembled on the free ends, the beams 9 and 20, or beam 9 and clamps 15 assembled, in the manner already described.

In order to eliminate any chance of a wedge clamp from working loose, a series of registering openings 21 is provided in the side plates of the wedge adapted to receive a pin

or nail 22 after the wedge is driven down on rod 4 the desired distance, the nail being inserted through the openings beneath the rod 4.

5 I may also provide vertical slots 23 in the sides of the wedges through which a smaller wedge as shown at 24 in Fig. 7 can be driven to thereby lock the main wedge in place, although the nail is preferable as it is more
10 convenient and less likely to fall out under working conditions.

A feature of my invention is the provision for breaking the rod off within the concrete wall and sealing over the rod end with concrete or cement, and to carry out this I provide each rod with a truncated cone 25 formed of light sheet metal adapted at its smaller end to closely encircle the rod 4 while permitting slidable movement of the cone
20 along the rod and rotation relative thereto. This cone is positioned on the rod between the form walls, the larger end of the cone having a metal tab 26 projecting outward from the edge of the base of the cone provided with an
25 opening 27 for a tack or nail so that the cone can be tacked against the inside surface of one of the walls to form a space around the rod and from which space the cone is removed after the concrete wall has hardened.

30 On the rod 4, and at a point just inside the smaller end of the cone, notches 28 are provided on opposite sides of the rod to weaken it so that the rod may be easily broken at this point by working the rod sidewise after the
35 concrete wall has hardened and all of the mold members have been removed. That portion of the rod extending from the side of the wall opposite the side carrying the cone is broken off flush with the side of the wall
40 since the groove 7 permits an easy breakage at that point.

After the rods have been broken off, and cones removed, leaving a recess 29 in the wall, as indicated in Fig. 1, the recess is later filled
45 with cement.

In order to permit an easy removal of the cone 25 the cone is split along one side and overlapped as indicated at 30 in Fig. 4 so that it may be collapsed slightly.

50 It is obvious from the description that where desired the cones 25 may be used at both sides of the wall.

Figs. 6, 7 and 8 show a modified form of wedge designated 10' in which the plates are the same except that the edges of the plates forming the inclined edge of the wedge are turned inward toward each other as at 31, the turned in edges being adapted to engage in the grooves 11 of the rod 4, thus eliminating
55 the use of the channel member 14.

In Figs. 6, 7 and 8 a small wedge 24 is shown as the means for retaining the wedge clamp 10' in place, wedge 24 being inserted through the vertical slots 23 and beneath the
60 rod 4. Openings 32 are provided along the

side of the small wedge to receive a pin or nail as indicated in Figs. 6 and 7 to prevent it from coming out.

Various minor changes can be made within the scope of the invention, such as the use of
70 metal mold forms instead of wood, also the clamps 10 may be forced directly against the form walls if desired and slotted plates may be used instead of the wire staples or keepers 8, and it is therefore understood that the following
75 claims are intended to cover such variations.

I claim:

1. A concrete form tie rod transversely grooved near its end, a keeper adapted to fit
80 in the groove, and a sheet metal wedge having spaced sides to straddle the rod formed to bear against said keeper at one of the angular faces of the wedge, the opposite
85 angular face of the wedge formed with a flat bearing plate.

2. In a mold structure for concrete including opposed form walls spaced from each other, studding outward of said walls arranged and adapted for supporting the same,
90 horizontally aligned rods transversely extending through said walls, beam members extending transversely against the outer edges of the studding and resting on a portion of the rods extending outward from the
95 form walls, means carried by said beam members slidably engaging said rods at points adjacent the opposite lateral sides of said beam members.

3. In a structure as defined in claim 2, said means detachable from said rods.

4. In a structure as defined in claim 2, said means each comprising an inverted U-shaped clamp arranged to extend across the
105 upper surface of the beam with its legs each extending adjacent opposite lateral sides of the beam, the legs upwardly hooked at their ends for engagement with one of said rods at spaced points therealong.

5. In a mold structure for concrete including opposed form walls spaced from each other, studding outward of said walls arranged and adapted for supporting the same, horizontally aligned rods transversely
115 extending through said walls, beam members extending transversely against the outer edges of the studding and resting on a portion of the rods extending outward from the form walls, inverted U-shaped clamps
120 carried by said beam members, each clamp arranged to extend across the upper surface of the beam with its legs each extending along the opposite lateral sides of the beam respectively and upwardly hooked at their
125 ends for engaging with one of said rods at points adjacent the lateral sides of the beam.

6. In a mold structure for concrete including opposed form walls spaced from each other, studding outward of said walls arranged and adapted for supporting the
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same, horizontally aligned rods transversely extending through said walls, beam members extending transversely against the outer edges of the studding and resting on a
5 portion of the rods extending outward from the wall forms, inverted U-shaped clamps carried by said beam members, each clamp arranged to extend obliquely across the upper surface of the beam with its legs upwardly hooked at their ends in opposite directions for engaging with one of said rods at points adjacent the lateral sides of the beam.

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