

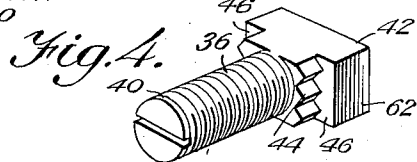
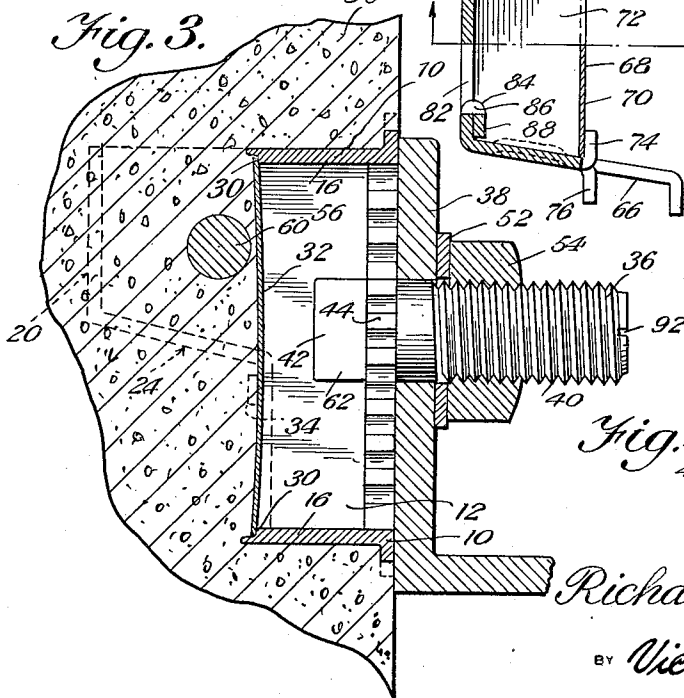
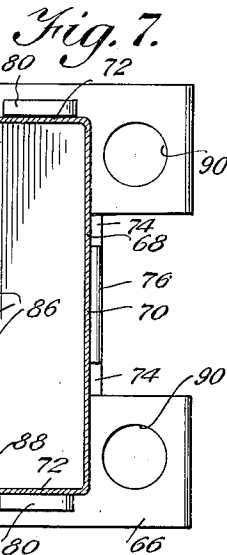
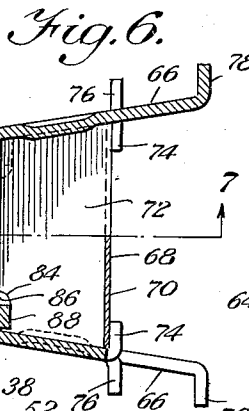
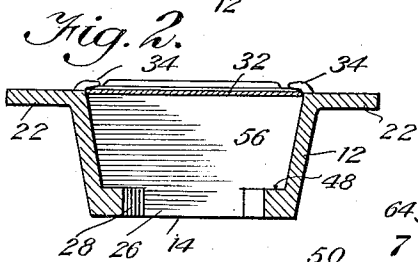
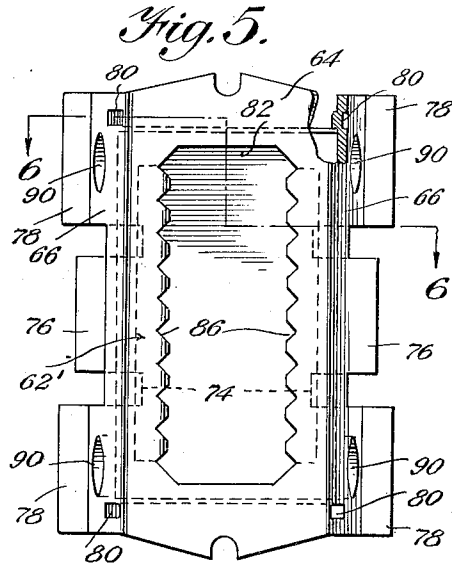
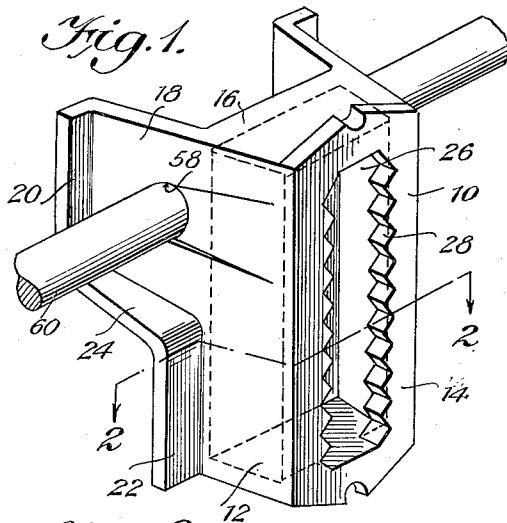
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2,163,446

INSERT ANCHOR

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2,163,446

INSERT ANCHOR

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2 Claims. (Cl. 72-105)

The present invention relates generally to concrete inserts. More particularly the invention relates to that type of insert which is adapted to hold an apertured structural element in connection with a concrete wall and as its parts comprises (1) an elongated box which is adapted for embedment in the concrete wall and has a front wall with a longitudinal slot therein; and (2) a bolt which is adjustable longitudinally of the box and has the head therefor disposed in the box and its shank projecting through the slot in the front wall of the box and adapted to enter the aperture in the structural element and carry a nut for clamping or securing the element in place.

One object of the invention is to provide an insert of this type which is an improvement upon and has certain advantages over previously designed inserts of the same general character.

Another object of the invention is to provide an insert of the type under consideration in which the head of the bolt and the slot defining portions of the front wall of the box embody respectively groups or sets of teeth and notches which are so designed that they hold the bolt in its various adjusted positions and when the box is in a vertical position hold the bolt horizontally in any particular adjusted position and thus facilitate mounting of the structural element on the shank of the bolt.

Other objects of the invention and the various advantages and characteristics of the present concrete insert will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

In the drawing which accompanies and forms a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views:

Fig. 1 is a perspective of an insert embodying one form of the invention;

Fig. 2 is a section on the line 2-2 of Fig. 1;

Fig. 3 is a longitudinal section showing the insert of Figs. 1 and 2 imbedded in a concrete wall;

Fig. 4 is a perspective of the bolt;

Fig. 5 is a front elevation of an insert embodying another form of the invention;

Fig. 6 is a section on the line 6-6 of Fig. 5; and

Fig. 7 is a section on the line 7-7 of Fig. 6.

The insert which is shown in Figs. 1, 2 and 3 of the drawing constitutes one form or embodiment of the invention. It is adapted for embedment in a concrete wall and comprises an elongated box 10. The latter includes side walls 12, a front wall 14 and end walls 16. The box according to Fig. 1 may be cast, and the side walls 12 include extensions 18 having laterally extending flanges 20 which are connected with similar flanges 22 projecting laterally from the walls 12 through the medium of angular flanges 24. In the front wall 14 I provide a longitudinal slot 26 having its vertical edges notched, as at 28. Notches 28 extend the full length of the slot. End walls 16 include ledges 30 for supporting a sheet metal plate 32 which is held in connected relation with the ledges through the medium of lugs 34 cast integrally with the box 10 but bent inwardly over the plate 32. By making the box 10 of malleable iron, the lugs 34 may be easily bent over the plate 32.

Fig. 4 illustrates a bolt 36 which is designed for cooperation with the box 10 for supporting an apertured structural member of conventional design, such as that indicated generally at 38 in Fig. 3. Bolt 36 comprises a threaded shank 40 and a rectangularly-shaped head 42. The shank 40 is provided with three teeth 44 at diametrically opposite points. These teeth are shaped to lie within the notches 28 and to fit snugly therein with the face 46 of the head 42 bearing against the inner front 48 of the face wall 14. The ends of the face 46 extend considerably beyond the diameter of the shank 40, but the head 42 in a transverse direction has a width corresponding to the diameter of the shank. The width of the head 42 is such as to permit the head to be inserted through the slot 26 with its length paralleling the vertical, but the face 46 may be brought into abutting relation with the face 48 of the front wall by rotating the bolt 90°.

In Fig. 3, I illustrate the box 10 as being incorporated in a concrete structure 50 with the outer surface of the front wall 14 terminating flush with the outer face of the concrete structure. Under such conditions the side walls 12, the extensions 18, and the flanges 20, 22 and 24 are effectively anchored in the concrete so as to support the box in an effective manner. After the concrete has set, the bolt 36 is connected with the box and adjusted to its proper position vertically of the slot 26 and rotated to bring the teeth 44 into holding relation with the corresponding notches 28. The structural member 38 is then placed in position. A lock washer 52 is then placed on the shank of the bolt 36 and the structural member is securely fastened in position by tightening a nut 54 which has threaded relation with the shank 40. Plate 32 forms an

effective seal when the concrete is poured, so as to prevent entrance of the concrete into the chamber 56 within the box 10. Thus, the bolt 36 may be moved freely upwardly or downwardly to secure the proper location.

In Figs. 1 and 3, I illustrate the extensions 18 as being provided with openings 58 for the reception of an anchoring rod 60 which is embedded in the concrete 50 to anchor the insert more securely. Rod 60 may be of any desirable length. Because of the flanges 20, 22 and 24, and the rod 60, the insert is so anchored to the concrete structure as to support enormous loads. Front wall 14 is of such thickness as to support the load transmitted thereto through the medium of the bolt 36. The end faces 62 of the bolt head 42 lie in close relation with the side walls 12 so that an efficient overlapping relation is secured between the face 46 and the inner surface of the front wall 14.

An important feature in my invention resides in the specific construction of the bolt 36. The three teeth 44 on diametrically opposite points have close fitting relation with the notches 28. The teeth 44 have sufficient strength to withstand forces transmitted thereto when the nut 54 is tightened, but the number of teeth and their spacing perform in part a desirable balancing action to the bolt 36 when first connected with the box 10. After rotation of the bolt through 90° and forward pulling of the bolt to bring the teeth 44 into proper meshing relation with the notches 28, the relation between the teeth 44 and the notches is such as to balance the bolt in substantially right angular relation with the front wall 14. I have found that the number of teeth illustrated, when properly fitted to the notches 28, will support the bolt against downward swinging movement, which facilitates connection with structures to be associated therewith. Face 46 abuts the inner surface of the front wall 14, and the teeth 44 because of their number and proportion cooperate with the face 46 for balancing the bolt. End walls 16 are arranged in right angular relation with the front wall 14 so as to provide maximum space within the compartment 58 for accommodating the bolt head 42. Slot 26 is of such length as to provide a large range of adjustment for the bolt to the end that the structural member 38 may be accurately positioned for altitude. Obviously, the insert may be located for positioning the slot 26 horizontally.

Figs. 5, 6 and 7 illustrate a different form of insert in which the box 62 is formed of sheet metal. The original blank is bent to provide a front wall 64 and diverging side walls 66. Within the box 62 I mount a U-shaped element 68 which has a wall 70 paralleling the wall 64 and end walls 72 arranged in right angular relation with the wall 64 and abutting the same. Each side wall 66 is slotted, and the material between the slots bent to provide two lugs 74 extending inwardly of the wall 70 for holding the element in pressure relation with the front wall 64. The material between the lugs 74 is bent outwardly to provide anchoring flanges 76 while the walls 66 are bent to provide anchoring flanges 78. Flanges 76 are positioned intermediate the front wall 64 and the flanges 78. To prevent endwise shifting of the element 68 I press the side walls 66 inwardly at 80. The right angular relation of the end walls 72 to the front wall 64 provides maximum shifting accommodation for the bolt 36 within the slot 82 in the front wall 64. Face wall 64 is bent back upon itself inwardly, as at

84, and the bends notched at 86 for the reception of the teeth 44 of the bolt 36. Notches 86 are spaced sufficiently far apart to constitute an effective connection between the front wall 64 and the marginal edges 88 which lie adjacent the inner face of the wall. Bolt 36 cooperates with the slotted front wall 64 in the same manner as with the slotted front wall 14 of the insert of Figs. 1, 2 and 3. Side walls 66 may be provided with openings 90 for the reception of anchoring rods, such as that illustrated at 60.

In Fig. 4, I have illustrated the end of the bolt 36 as being provided with a kerf 92 which parallels the longitudinal axis of the head 42. Kerf 92 serves as a guide so that the worker may determine the precise relation of the bolt to the kerf. By rotating the bolt sufficiently far to bring the kerf 92 in right angular relation to the vertical, the head 42 will be properly positioned within the insert.

Without further elaboration, the foregoing will so fully explain my invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

I claim:

1. As a new article of manufacture, an insert designed primarily to support an apertured structural element and comprising an elongated box adapted for embedment in a concrete wall and including an exposed front wall with a longitudinal slot therein and opposed notches along the sides of the slot, and also including side, back and end walls adapted to be surrounded by the concrete and to form a compartment with the front wall, and a bolt consisting of an externally threaded shank adapted to extend through the aperture of the structural element and to carry an element clamping nut, and a transversely elongated block-like head connected fixedly and rigidly to one end of the shank and having the ends thereof projecting an appreciable distance outwardly of the shank and provided at the points of connection to said one end of the shank with oppositely facing sets of teeth corresponding in shape to the notches and terminating inwardly of the end extremities of the head, said bolt being adapted to have the head thereof inserted into the compartment by arranging it lengthwise of the slot and then passing it through said slot and being further adapted to be moved bodily lengthwise of the slot to any desired position and then turned ninety degrees and moved away from the box to bring the sets of teeth into interlocked relation with the adjacent notches and the end extremities of the head into abutment with the inner face of the box front wall, said teeth and notches being extremely close fitting when in engagement and being of such thickness that when the box is in a vertical position and the bolt is in its operative position, they coact securely to lock said bolt in a horizontal position against tilting and thus facilitate mounting of the structural element on the bolt shank.

2. As a new article of manufacture, an insert designed primarily to support an apertured structural element and comprising an elongated box adapted for embedment in a concrete wall and including a metallic front wall having a longitudinal slot therein and the portions thereof that define the sides of the slot bend inwardly, then outwardly and shaped at the bends to form opposed notches along the sides of the slot, said box also including side, back and end walls adapted to be surrounded by the concrete and to form with the front wall a compartment closed against

the entry of concrete, and a bolt consisting of an externally threaded shank adapted to extend through the aperture of the structural element and to carry an element clamping nut, and a
5 transversely elongated block-like head connected fixedly and rigidly to one end of the shank and having the ends thereof projecting an appreciable distance outwardly of the shank and provided at the points of connection to said one end
10 of the shank with oppositely facing sets of teeth corresponding in shape to the notches and terminating inwardly of the end extremities of the head, said bolt being adapted to have the head thereof inserted into the compartment by ar-
15 ranging it lengthwise of the slot and then passing it through said slot and being further adapted

to be moved bodily lengthwise of the slot to any desired position and then turned ninety degrees and moved away from the box to bring the sets of teeth into interlocked relation with the adjacent notches and the end extremities of the
5 head into abutment with the inner face of the box front wall, said teeth and notches being extremely close fitting when in engagement and being of such thickness that when the box is in a vertical position and the bolt is in its operative
10 position they coact securely to lock said bolt in a horizontal position against vertical tilting and thus facilitate mounting of the structural element on the bolt shank.

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