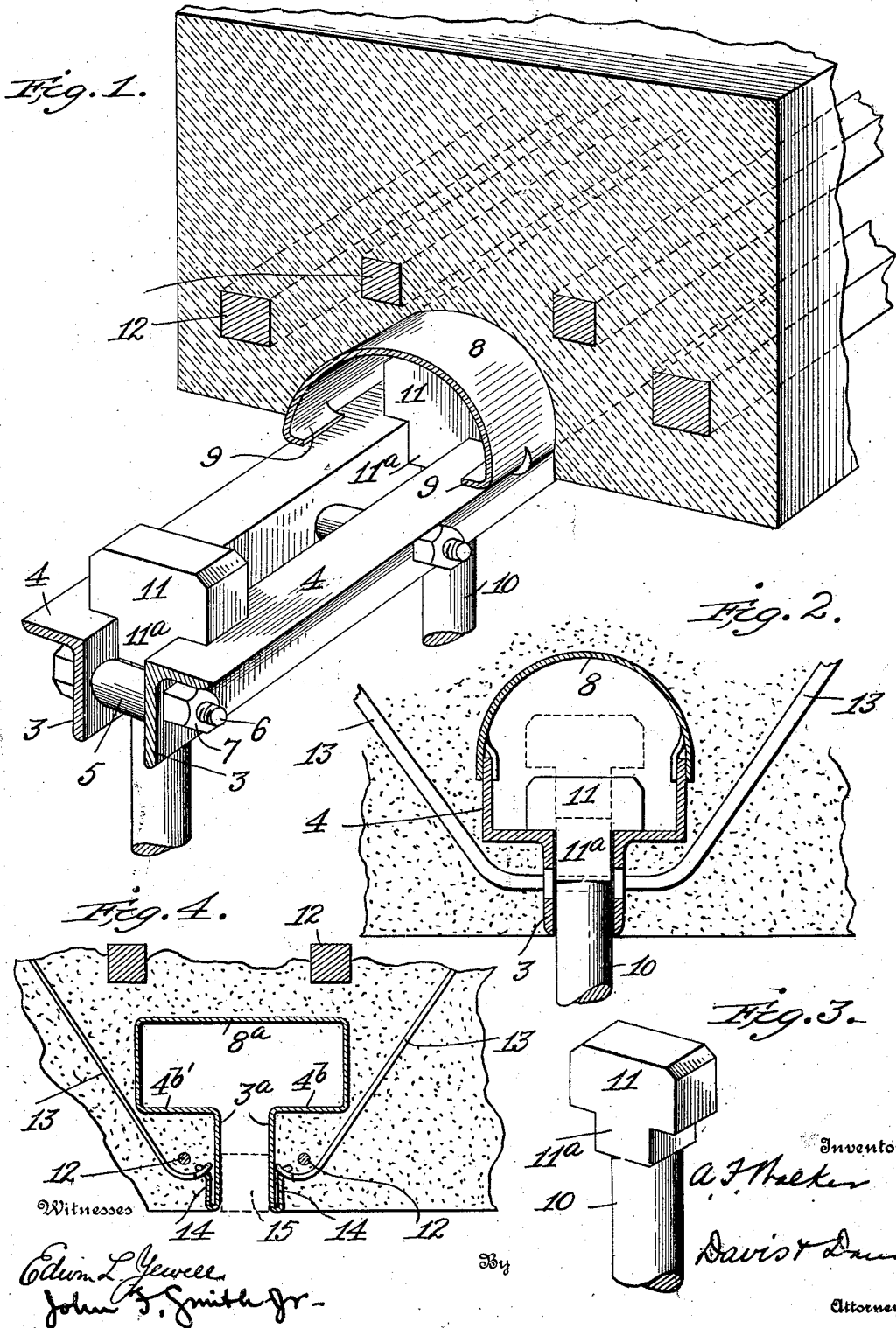


No. 874,462.

PATENTED DEC. 24, 1907.

A. F. WALKER.
CONCRETE STRUCTURE.
APPLICATION FILED AUG. 15, 1907.



UNITED STATES PATENT OFFICE.

ARTHUR FRANCIS WALKER, OF ATLANTA, GEORGIA.

CONCRETE STRUCTURE.

No. 874,462.

Specification of Letters Patent.

Patented Dec. 24, 1907.

Application filed August 15, 1907. Serial No. 388,724.

To all whom it may concern:

Be it known that I, ARTHUR FRANCIS WALKER, a citizen of the United States of America, and resident of Atlanta, county of Fulton, State of Georgia, have invented certain new and useful Improvements in Concrete Structures, of which the following is a full and clear specification, reference being had to the accompanying drawing, in which—

Figure 1 is a perspective view of a concrete beam embodying my invention; Fig. 2 a transverse section thereof showing a slight modification; Fig. 3 a detail perspective view showing the peculiar formation of the head of the hanger-bolt; and Fig. 4 a vertical transverse section showing another modification of the channel-forming means.

The object of this invention is to provide a concrete beam or other structure with a simple support for bolts for shaft and other hangers, the support being embedded in the under side of the beam and forming a longitudinal channel for the reception of the supporting heads of the hanger-bolts and serving to reinforce the beam, as more fully hereinafter set forth.

A further object is to provide a hanger-bolt which is especially adapted for use in connection with my said support and which is adapted to be readily attached to and detached from the support and which when attached will be prevented from axially rotating, as more fully hereinafter set forth.

Referring to the drawing annexed by reference numerals, 1 designates the concrete structure which in the present instance is in the form of a beam. Embedded in the mass of concrete along the under side thereof are two angle irons, the vertical members 3 of which are parallel and have their lower longitudinal edges flush with the lower side of the beam. These vertical members are parallel with each other and spaced a suitable distance apart, and each is provided at its upper end with an outwardly extending horizontal member 4 which latter members are also embedded in the concrete and rest directly upon the main mass of concrete and therefore form strong anchoring means by which the angle irons are rigidly anchored in the mass.

To separate the vertical members of the angle irons and hold them in a fixed position with respect to each other, tubular separators 5 are placed between the members at intervals, these separators being clamped in

place rigidly by means of horizontal bolts 6 each of which passes through one of the separators and registering holes in the vertical members and is provided with a suitable tightening nut 7. These bolts besides clamping the separators in place serve to prevent spreading of the vertical members 3 under the strain imposed thereon through the hanger-bolts.

To form a channel over the angle irons for the reception of the heads of the hangers, I secure a cap-piece 8 to the outer edges of the horizontal flanges of the angle irons thus forming a closure which effectually prevents concrete from entering the space under the arch during the process of molding the concrete structure. This cap may be secured to the edges of the angle irons in any suitable manner, and preferably as shown, namely, by providing the edges of the sheet metal cap at intervals with an inwardly extending clip 9 which engages the upper face of the angle iron while the main part of the cap engages under the outer edges of the angle iron. It is desirable that the concrete structure shall be strengthened by suitable longitudinal reinforcing rods 12, and while the angle irons are self-anchoring in a large measure I may desire to attach suitable anchoring rods 13 to the angle irons at intervals. I may also desire, for the purpose of strengthening the angle irons and the structure, to provide the angle irons with upwardly extending flanges 4^a, as shown in Fig. 2.

With the above described structure I may use any suitable form of hanger-bolt but I prefer the form shown which consists of a suitable heavy hanger bolt or rod 10 having a laterally enlarged head 11 at its upper end which is adapted to rest upon the upper faces of the horizontal members of the angle irons and thus support the hanger. The head of the hanger bolt is slightly less in width than the space between the angle irons so that the hanger-bolt may be readily inserted and removed by simply turning the hanger bolt so that the head shall lie parallel with the slot, and to prevent the hanger bolt rotating after once inserted a portion of the hanger rod or bolt below the head is squared at 11^a, this squared portion being adapted to fit down between the inner walls of the angle irons and thus prevent the hanger-bolts rotating to a point where they may drop down and out. In inserting and removing the hanger-bolts, this squared portion 11^a re-

quires that the hanger bolt shall be pushed up far enough into the channel to bring the lower edge of the squared portion above the bottom of the channel, as shown in dotted lines in Fig. 2, in which position the hanger-bolt may be turned in either direction.

As shown in Fig. 4, the channel in the beam may be formed by means of a single piece of sheet metal bent into shape to form the vertical members 3^a, the horizontal members 4^b, and the cap piece 8^a, thus cheapening the cost of the structure. In this type of structure I prefer embedding a pair of the reinforcing rods 12 at a suitable point below the horizontal members 4^b, and I also prefer turning up into the concrete the lower edges of the vertical members 3^a, to form stiffening flanges 14 which are embedded in the concrete mass and which are preferably connected to the upwardly extending anchoring rods 13. To prevent the vertical sheet metal members 3^a from being pressed inwardly toward each other during the construction of the beam, I prefer inserting therebetween a suitable wooden block or rod 15, as shown in dotted lines in Fig. 4.

It will be observed that in order to obtain the maximum stiffening effect of the flanges 14 they are carried up approximately parallel with the vertical members 3^a, and furthermore it will be observed that by keeping the flanges thus close to the vertical members and terminating them short of the horizontal members 4^b, these members 4^b rest directly on the main mass of the concrete and thus avoid weakening that would follow by extending these flanges 14 upwardly and outwardly around the channel. These flanges also afford a convenient means for attaching the anchoring rods 13, and the beam is further strengthened underneath the horizontal members 4^b by means of the reinforcing rods 12.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent, is—

1. In combination, a concrete structure having embedded in its under side metallic means forming a channel therein opening downwardly, and a hanger-bolt having a head portion at its upper end adapted to pass up into said channel and be supported therein when turned, said hanger bolt having an angular portion 11^a between said head and the main shank of the hanger bolt, said portion being adapted to fit down between the vertical side walls of the channel and thus lock the hanger bolt against rotation.

2. In combination, a concrete structure, a channel-forming device embedded in the under side thereof and consisting of sheet metal bent to form vertical separated members or plates whose lower edges terminate approximately at the lower face of the concrete structure, horizontal members projecting

laterally from the upper edges of said vertical members and resting directly upon the main mass of concrete, and a cap or arch portion connecting the outer edges of the horizontal members and forming a closed channel.

3. In combination, a concrete structure, a channel-forming device embedded in the under side thereof and consisting of sheet metal bent to form vertical separated members or plates whose lower edges terminate approximately at the lower face of the concrete structure, horizontal members projecting laterally from the upper edges of said vertical members and resting directly upon the main mass of concrete, and a cap or arch portion connecting the outer edges of the horizontal members and forming a closed channel, said lower edges of the vertical members being provided with upturned flanges embedded in the concrete mass and having anchoring rods connected thereto.

4. In combination, a concrete structure; a channel-forming device embedded in the under side thereof and consisting of sheet metal bent to form vertical separated members or plates whose lower edges terminate approximately at the lower face of the concrete structure, horizontal members projecting laterally from the upper edges of said vertical members and resting directly upon the main mass of concrete, and a cap or arch portion connecting the outer edges of the horizontal members and forming a closed channel, said lower edges of the vertical members being provided with upturned flanges embedded in the concrete mass and terminating short of the horizontal members and having anchoring rods connected thereto and extending up into the beam.

5. In combination, a concrete structure, a channel-forming device embedded in the under side thereof and consisting of sheet metal bent to form vertical separated members or plates whose lower edges terminate approximately at the lower face of the concrete structure, horizontal members projecting laterally from the upper edges of said vertical members and resting directly upon the main mass of concrete, and a cap or arch portion connecting the outer edges of the horizontal members and forming a closed channel, the lower edges of the aforesaid vertical members being turned abruptly upward and terminated short of the horizontal members and provided with anchoring rods extending up into the beam, and reinforcing rods embedded in the beam under said horizontal members.

In testimony whereof I hereunto affix my signature in the presence of two witnesses this 12 day of August 1907.

ARTHUR FRANCIS WALKER.

Witnesses:

JACK HEAD,
GEO. B. ANIMAN.