Oct. 7, 1969 H. BORMANN ET AL 3,471,118

APPARATUS FOR HOLDING THREADED SLEEVES IN THE SHELL FORM FOR PRODUCING CONCRETE RAIL TIES

Filed July 26, 1967 2 Sheets-Sheet 1

Fig. 1

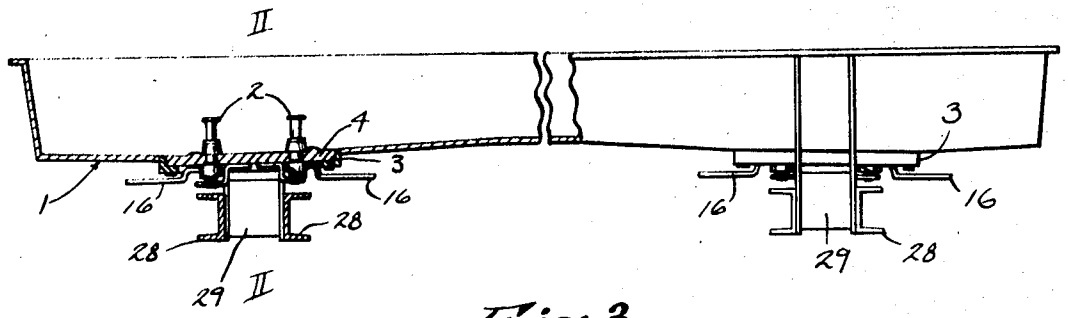


Fig. 3

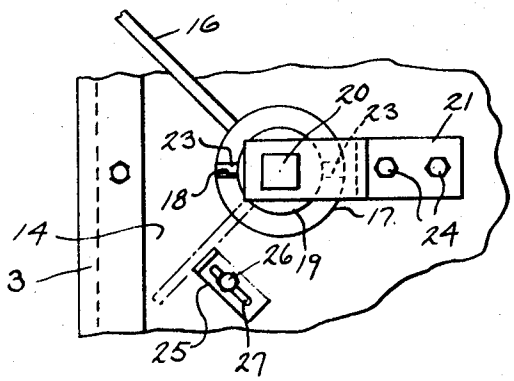
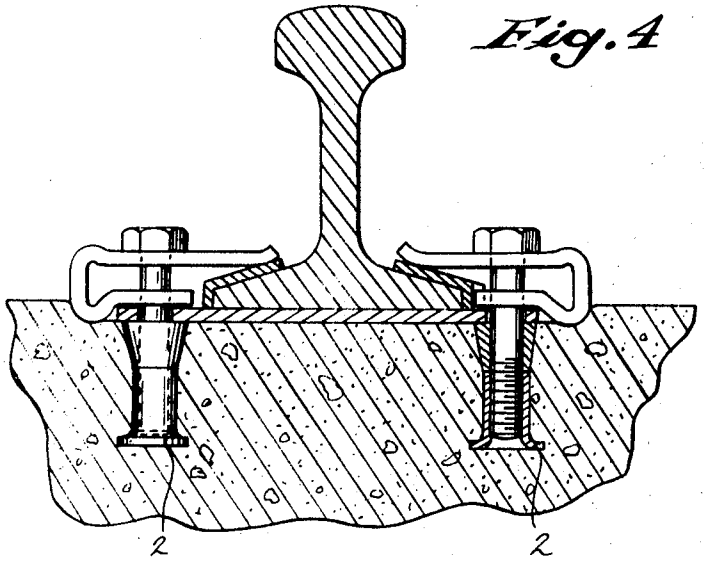


Fig. 4



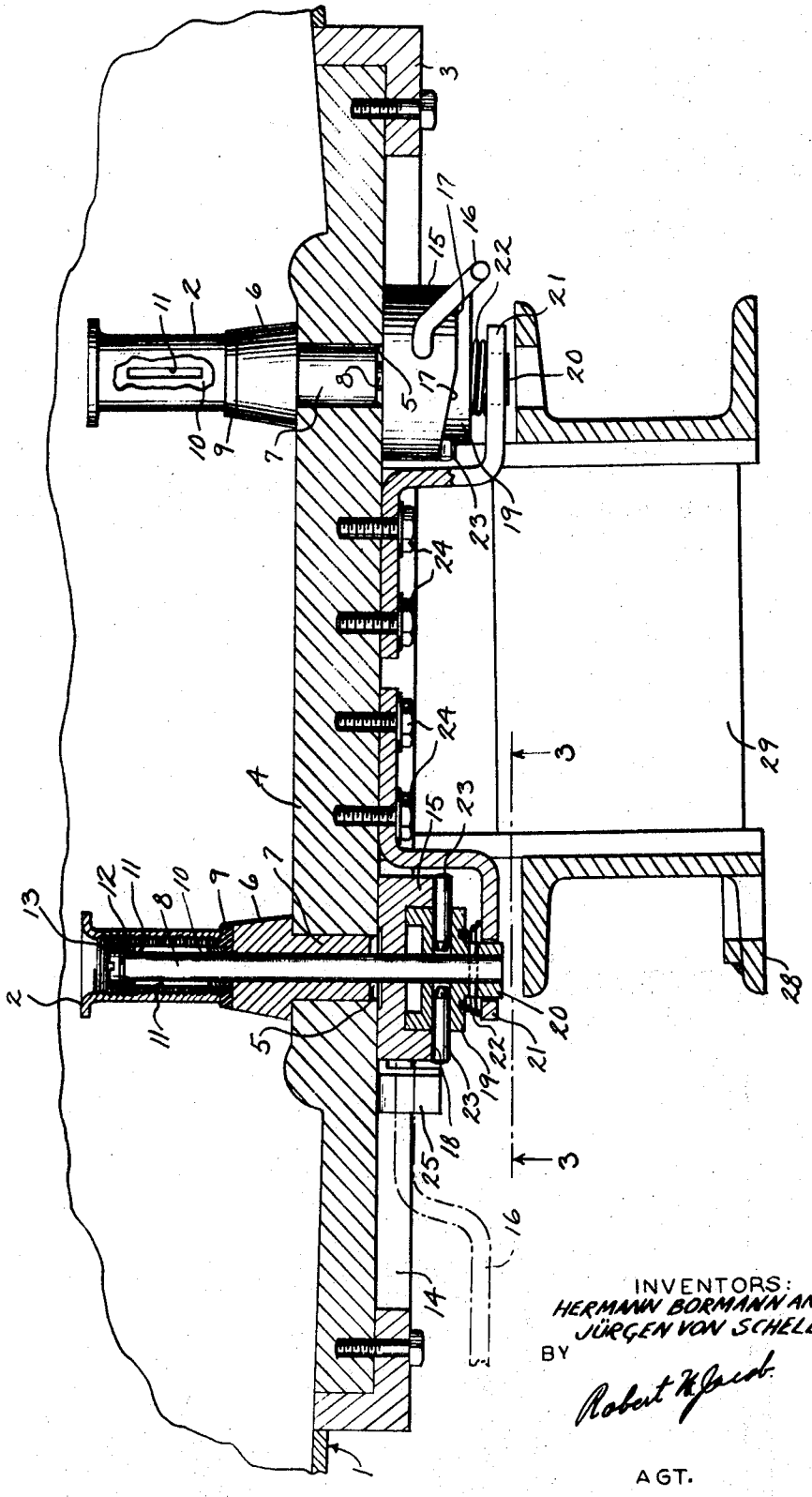
INVENTORS
HERMANN BORMANN AND
JÜRGEN VON SCHELL
BY
Robert W. Jacob
AGT.

Oct. 7, 1969 H. BORMANN ET AL 3,471,118

APPARATUS FOR HOLDING THREADED SLEEVES IN THE SHELL FORM FOR PRODUCING CONCRETE RAIL TIES

Filed July 26, 1967 2 Sheets-Sheet 2

Fig. 2



INVENTORS:
HERMANN BORMANN AND
JÜRGEN VON SCHELL
BY
Robert K Jacob
AGT.

United States Patent Office 3,471,118 Patented Oct. 7, 1969

3,471,118

APPARATUS FOR HOLDING THREADED SLEEVES IN THE SHELL FORM FOR PRODUCING CONCRETE RAIL TIES

Hermann Bormann, Wiesbaden-Erbenheim, and Jürgen von Schell, Wallau, Germany, assignors to Dyckerhoff & Widmann Kommanditgesellschaft, Munich, Germany, a firm

Filed July 26, 1967, Ser. No. 656,237
Int. Cl. B28b 7/16, 23/00
U.S. Cl. 249—91 4 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus for providing concrete railroad sleepers or ties with threaded sleeves of steel to which components for securing the rails can be fastened including a metal form into which the concrete is poured and which has a recess and mounting means at the bottom, including an insert plate from which an anchoring rod extends through the sleeve to hold it rigidly in position.

BACKGROUND OF THE INVENTION

The present invention relates to railroad sleepers or ties and is more particularly concerned with apparatus for the manufacture of prefabricated ties which are provided with threaded sleeves, to which the rail mounting components are subsequently secured.

The invention is based on the problem of building threaded sleeves into concrete railroad ties during the production thereof at the time the concrete is formed in the steel shell or form, and where the sleeves must be securely held in their position during the concreting operation so that subsequently rail mounting components can be secured in the sleeves. This problem must be solved by taking into consideration that no components may be built in that pass completely through the railroad ties. Accordingly, it is an object of the invention to provide apparatus for securely retaining the threaded sleeves while the concrete is poured and which permits, on the one hand, installing the sleeves rapidly and in a simple manner and, on the other hand, sufficiently rigidly and safely in the shell prior to the concrete pouring.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects and advantages of the apparatus in accordance with the invention will become apparent from the following specification with reference to the accompanying drawings, in which:

FIG. 1 is a longitudinal section through the shell form showing the sleeve mounting means,

FIG. 2 illustrates to an enlarged scale the detail A indicated in FIG. 1,

FIG. 3 is a bottom view taken along line III—III in FIG. 1, and

FIG. 4 is a sectional view of a concrete railroad tie illustrating the finished product with the sleeves embedded.

DESCRIPTION OF THE INVENTION

FIG. 1 illustrates the shell form 1 for the production of a concrete tie. The tie is produced in inverted position, so that the threaded sleeves 2 for threadedly receiving the rail fastening components which in the final condition are located at the top side of the tie have to be secured to the bottom of the forming shell 1. In order to provide for the top side of the tie in the area where the rails are located and for the rail mounting means to be as accurately disposed as possible, the shell form is provided with a recess or depression 3 where an insert plate 4 is arranged,

the upper surface of which presents an exact negative of the upper surface of the tie.

In two exactly predetermined locations two bores 5 are provided in the insert plate 4 in which a frusto-conical spacing block is firmly secured at its lower cylindrical end 7. This spacing block 6 is provided with a bore along its longitudinal center axis. A fastening bolt 8 extends through this bore. The threaded sleeve 2 that is to be set in the concrete is disposed upon the spacing block 6 on an intermediate compensating disk 9 which may suitably be made of plastic material. In the interior of the threaded sleeve 2 into which the fastening bolt 8 extends, a plastic sleeve 10 is located which is provided in its outer wall with longitudinally extending slots 11. A disk 12 is disposed upon this sleeve 10 and is secured to the end of the bolt 8 either by means of a nut or by a screw 13 which extends into the end of the bolt.

The shell form 1 is provided with a recess 14 in the depression 3 in which an outer socket 15 is located proximate the lower end of the bolt 8, which socket is in direct engagement with the bottom of the insert plate 4. A pivotally movable lever 16 is secured to the outer socket 15, which is dished or pot-shped. The upper edge of the socket 15 presents inclined surfaces 17, at the highest point of which a groove 18 is located.

Inside of the outer socket 15 an inner socket 19 is provided which is rigidly secured to the bolt 8. On the other side the socket 19 is connected with a square member 20 which is axially movable but is secured against rotation in a suitable aperture of a mounting bracket 21. Between the inner socket 19 and the support on the retaining bracket 21 a pressure spring 22 is located. Furthermore, a pin 23 extends through the socket 19 transversely of its longitudinal axis. The mounting bracket 21 is secured to the insert plate 4 by means of screws 24.

When the lever 16 is pivotally moved, the inclined surfaces 17 of the outer socket 15 slide along the stationary pin 23 which is securely fastened against rotation, so that the inner socket 19 is moved downwardly against the pressure spring 22 until the pin 23 interengages the groove 18 at the upper end of the socket 15. During this movement the bolt 8 which is connected with the inner socket 19 is moved downwardly, and the sleeve 10 which is made of plastic material, rubber or the like, is compressed and expanded. The compression movement is enhanced by the longitudinal slots 11. As a result of the expansion the sleeve is circumferentially widened in a manner that the threaded seeve 2 is clamped in its seat on the spacing block 6.

The releasing of the mounting device takes place in the reverse manner, in that the pivot lever 16 is moved out of the groove and the compression spring 22 as it is relieved of pressure forces the bolt 8 upwardly by way of the socket 19. As a result the sleeve 10 tends to resume its original position due to its elasticity, so that the threaded sleeve is released and the tie can be removed from the shell. In order to limit the path of movement of the pivot lever 16 an abutment 25 is provided at the bottom side of the insert plate 4 which is adjustable in a slot 27 by means of screws 26.

Since two threaded sleeves 2 are required for each rail mounting, the apparatus is duplicated in a maner that each set of components is disposed symmetrically with respect to the axis of the rail substantially in mirror image fashion. The apparatus is shown at the left of FIG. 2 in cross-section, while on the right it is shown partly in section and partly in elevation.

The shell form is also provided with a pair of supporting brackets 28 which are connected by a web 29.

In order to aid in more clearly understanding the invention FIG. 4 illustrates the finished product of the

railroad sleeper or tie with the sleeves embedded in the concrete.

Having now described our invention with reference to the embodiment illustrated in the drawings, we do not wish to be limited thereto, but what we desire to protect by Letters Patent of the United States is set forth in the appended claims.

I claim:

1. Apparatus for holding threaded sleeves in shell forms during the production of concrete railroad ties comprising an elongated shell form of the general configuration of a railroad tie having a bottom corresponding essentially to the top of a railroad tie, a pair of depression in said bottom one proximate each end of said shell form, a recess defining an opening in each said depression, an insert plate disposed in each said depression and having a bottom extending over said recess, a pair of mounting apertures in each said insert plate proximate opposite ends thereof, a mounting bracket secured to the bottom of said insert plate adjacent each mounting aperture, each said bracket extending through said recess and having a portion presenting a retaining aperture in alignment with one said mounting aperture in said insert plate, a spacing block having a portion extending into each said mounting aperture and a portion extending above said insert plate and supporting a threaded sleeve, said spacing block having an axial bore, an elastic sleeve disposed in said threaded sleeve, an outer socket disposed below said insert plate and having an aperture in alignment with said mounting aperture, an inner socket disposed in said outer socket having a member extending into said retainer aperture and a bolt extending upwardly through said outer socket, said plate, said spacing block and said elastic sleeve,

means securing the end of said bolt against said elastic sleeve, said outer socket having an inclined shoulder and said inner socket having a member in engagement with said inclined shoulder whereby rotation of said outer socket moves said inner socket and said bolt to expand said elastic sleeve and securely hold said threaded sleeve.

2. Apparatus in accordance with claim 1, where a spring is disposed between said inner socket and said bracket.

3. Apparatus in accordance with claim 1, including a lever arm secured to said outer socket for rotating said outer socket relative to said inner socket and said bolt.

4. Apparatus in accordance with claim 3, where said outer socket has a pair of shoulders inclined in the same direction of rotation, a groove at the end of each inclined shoulder, and said inner socket has a pair of pins extending outwardly therefrom each into engagement with one said shoulder.

References Cited

UNITED STATES PATENTS

2,656,115	10/1953	Sonneville.	
2,695,754	11/1954	Karig	249—96 X
2,924,962	2/1960	Nettle	25—121 X
3,190,041	6/1965	Kimball	25—121 X
3,190,607	6/1965	Sonneville	249—91
3,205,634	9/1965	Wagner	249—83 X
1,907,618	5/1933	Umbach et al.	249—43 X

J. HOWARD FLINT, JR., Primary Examiner

U.S. Cl. X. R.

249—86, 142, 160, 163