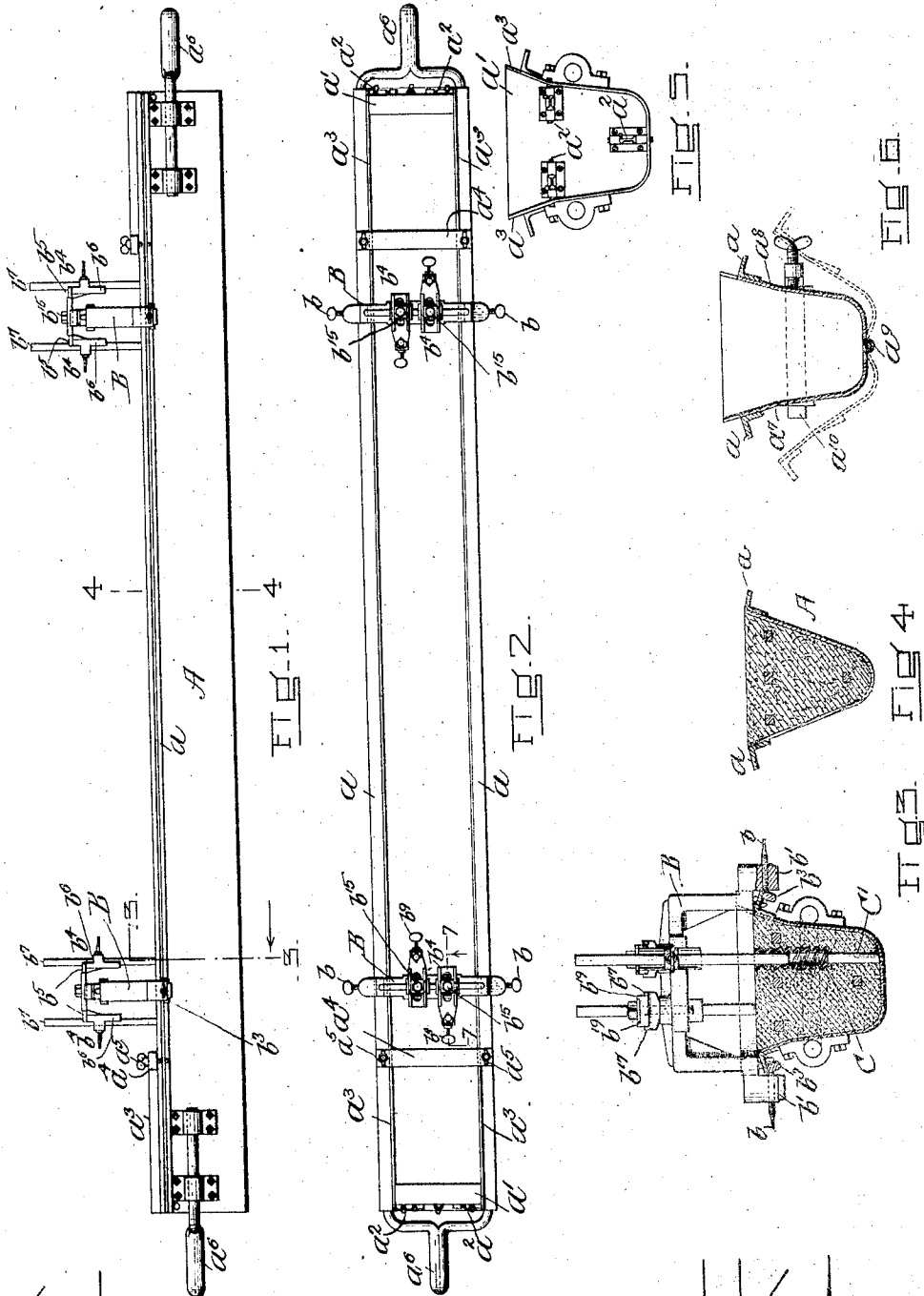


H. E. PERCIVAL,  
MOLD FOR CEMENT OR CONCRETE TIES.  
APPLICATION FILED NOV. 30, 1910.

Patented Aug. 27, 1912.  
2 SHEETS—SHEET 1.

1,036,697.



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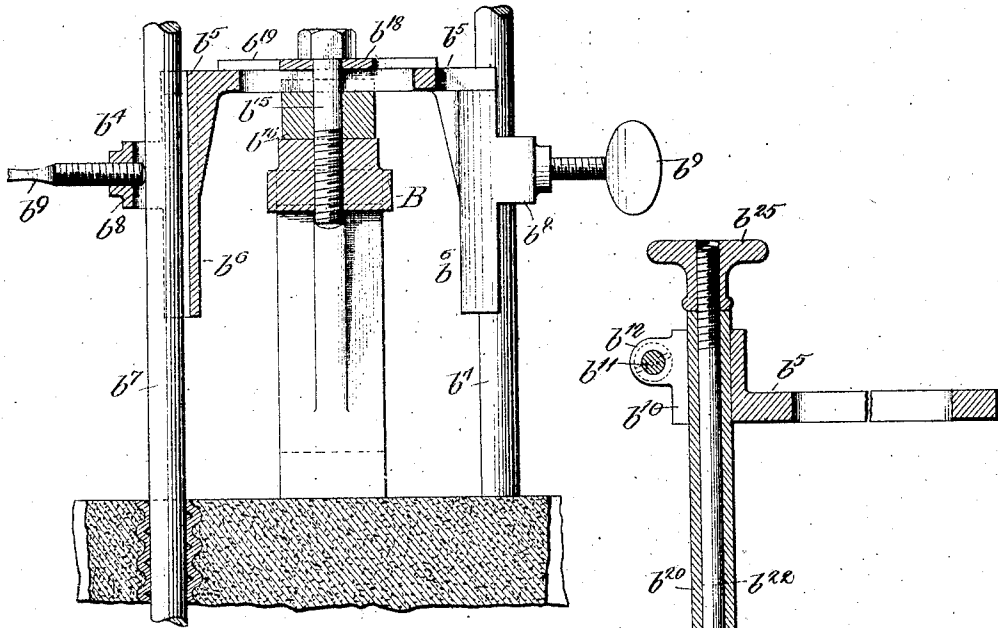


Fig. 7.

Fig. 8.

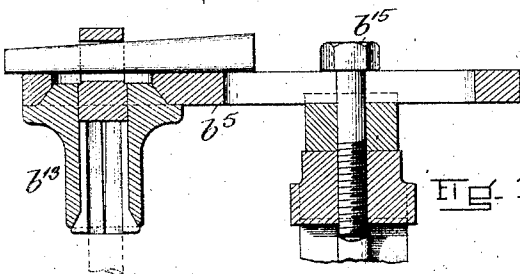


Fig. 10.

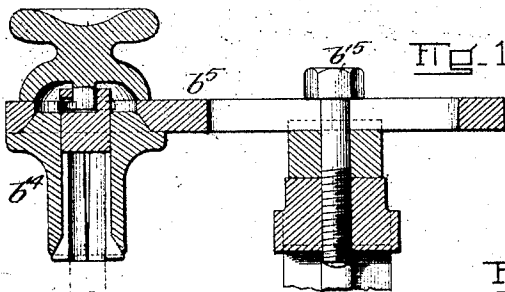


Fig. 11.

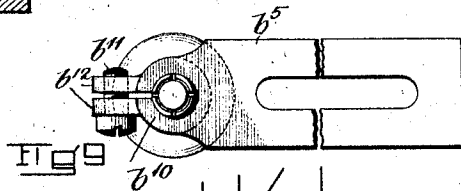


Fig. 9.

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# UNITED STATES PATENT OFFICE.

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MOLD FOR CEMENT OR CONCRETE TIES.

1,036,697.

Specification of Letters Patent.

Patented Aug. 27, 1912.

Application filed November 30, 1910. Serial No. 594,853.

*To all whom it may concern:*

Be it known that I, HERBERT ELMER PERCIVAL, of Houston, in the county of Harris and State of Texas, a citizen of the United States, have invented a new and useful Improvement in Molds for Cement or Concrete Ties, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The object of my invention is to provide a mold especially adapted for casting cement or concrete railroad ties having a form substantially in accord with my United States Patent, No. 795,414, dated July 25, 1905, for an improvement in railroad ties.

It is a further object of my invention to provide the mold with means whereby sockets may be made or cast in the cement ties for receiving the fastenings that hold the rails. In this connection it should be understood that in the case of a cement or concrete tie some provision must be made by which sockets are performed in the tie for receiving the rail fastenings inasmuch as such fastenings cannot be driven into or made to engage with the concrete mass itself by reason of its hardness.

Accordingly the means which it is the further object of my invention to provide is means adapted for supporting auxiliary sockets by which these sockets may be cast in the cement or concrete mass as the tie is formed in the mold.

My invention can best be seen and understood by reference to the drawings, in which—

Figure 1 shows the mold in side elevation. Fig. 2 shows the same in plan. Fig. 3 is a cross section on the line 3—3 of Fig. 1. Fig. 4 is a cross section on the line 4—4 of Fig. 1. Fig. 5 shows the mold in end elevation. Fig. 6 is a cross section of the body of the mold showing a slightly modified construction thereof. Fig. 7 is a section on the line 7—7 of Fig. 2. Fig. 8 shows in vertical section a detail of construction to which reference will hereinafter be made. Fig. 9 shows in plan a portion of the construction shown in Fig. 6. Figs. 10 and 11 show, respectively, cross vertical sections of further details of construction to which, also reference will hereinafter be made.

In the drawings:—A represents the body of the mold. This comprises an open trough-like receptacle preferably made of sheet

metal and formed whereby the cavity within it may give proper form to the tie upon filling the receptacle or mold with plastic material or cement. The tie which the mold is especially designed to form is one having broad-bearing end portions with the tie becoming substantially V-shaped in cross section along the central portion thereof. To give strength to the sides of the mold they are reinforced along their top edges by an angular reinforcement *a*.

The ends of the mold are closed. When the mold is made of sheet metal its ends may be closed as shown in the drawings by separate end pieces or members *a'* fitting into the ends of the mold and separably attached thereto as may be done by common bolts *a''* attached to the end pieces or members *a'* and fastening into the respective sides and bottom of the mold. The depth of the mold is such as to provide an interior cavity of just the depth or vertical thickness of the tie. In this connection it is to be observed that the ends of the mold are deeper than the portion thereof between the ends. The increased depth of the mold at the point of its ends is effected by upwardly extending the sides of the mold by portions *a''*. Such provision is made in order to provide an edge or shoulder against which the cushion may bear upon which the rail rests thereby preventing an outward displacement of the cushion and consequent spreading of the rails. These shoulders are formed by cross pieces *a'* which rest upon the upper edges of the sides of the mold just adjacent to the inner ends of the extended portions *a''* abutting against the same, the plastic cement or material being filled into the mold back of these pieces *a'* up to a point where the top surface of the filling will lie flush with the top edges of the extended portions *a''*. Accordingly when the pieces *a'* are removed shoulders will be formed in the tie. The cross pieces *a'* are removable by releasably attaching the same to the mold by thumb screws *a'''* which fasten into the angular reinforcement extended along the top edges of the sides of the mold as before described.

Attention will now be directed to the means forming a part of the mold and providing means whereby sockets may be formed in the tie for receiving the fastenings which hold the respective rails in place. Extending crosswise over the mold and resting upon the top edges thereof at about

the point where the sockets are to be formed in the tie is a yoke B. In fact there are two yokes arranged upon the mold, one at either end thereof, to provide sockets for receiving the fastenings for the two rails. Description will, however, only be made of one. The yoke B, as said before, rests upon the top edges of the mold and is made sufficiently wide to rest thereon with a relatively wide bearing. It is attached to the mold by means of thumb screws  $b$  which fasten through the lugs  $b^1$  dependent from the yoke on either side of the mold, the fastenings being threaded in and extending through these lugs and bearing against butts  $b^2$  dependent from the outwardly flaring edge of the angular reinforcement  $a$  extending along the top edges of the sides of the mold, as before described. It is to be observed, also, that the butts  $b^2$  are inwardly inclined so that as the thumb screws  $b$  are tightened against them the tendency will be for the screws to slide along the inclined surface of the butts and, accordingly to draw the yoke tightly against the top of the mold thereby holding it securely in place. A release of the yoke may be obtained simply by releasing the thumb screws.

Attached to the head of the yoke B are brackets  $b^3$ . There are two of these brackets separately arranged on the head of each yoke and they extend laterally from it in opposite directions. Each of the brackets comprises an arm  $b^4$  which adjustably connects with the head of the yoke as will hereinafter be explained and a clamping portion  $b^5$  for receiving and holding a rod  $b^7$ . These rods carry sockets C which are the sockets to be molded into the tie for receiving the rail fastenings, the rods  $b^7$  being arranged to extend down into the cavity of the mold and rigidly hold the sockets therein during the placing of the plastic material or cement in the mold and during its setting or hardening.

The sockets must, of course, be very accurately located. In their vertical disposition the sockets should be so held that the open mouth of each socket will be flush with the top surface of the tie when formed. The lateral positioning of the sockets should also be such that the sockets will lie at points just adjacent to the flanges of the respective rails in order the rail fastenings may enter the sockets and properly engage with the flanges of the rails. The vertical positioning of the sockets is arranged for by adjustably securing the rods to the brackets. In Fig. 7 the portion  $b^6$  of the brackets into which the rods fit is made vertically grooved or channeled with an arm  $b^8$  extending from the vertical grooved portion of the bracket and partly around the rod when fitted into the grooved portion of the bracket, the rod being held therein by a thumb screw  $b^9$

which passes through the arm  $b^8$  of the bracket and bears against the side of the rod binding it to the bracket. Upon loosening the thumb screw a vertical adjustment of the rod may be obtained and consequently a vertical positioning of the socket carried by the rod. Other means for adjustably retaining the rods may be employed, as for example, in Figs. 8 and 9 the bracket to which the socket-bearing rod is secured comprises a slotted arm  $b^5$  the same as shown in Fig. 6, which adjustably connects with the head of the yoke. The outer end portion of this arm, or in other words, that portion thereof in which the rod fits comprises a slit head  $b^{10}$  having in it an opening for vertically receiving the rod and in which the rod may be moved adjustably, the head being tightened around the rod for maintaining it at any point of adjusted position by means of a screw  $b^{11}$  passing through ears  $b^{12}$  extending from the respective sides of the split head.

In Figs. 10 and 11 I have shown chucks  $b^{13}$ ,  $b^{14}$  arranged upon the ends of the slotted arms  $b^5$  for receiving and holding the socket-bearing rods  $b^7$ . With respect now to the means for obtaining an adjustable lateral positioning of the rods and sockets. Each of the slotted arms  $b^5$ , on the end of which the socket-bearing rods are borne, connects, as said before, with the heads of the respective yokes, the arms being attached to the yokes by means of bolts  $b^{15}$  which pass through the slots in the arms and through also nuts or bearings  $b^{16}$  on which the arms rest and then fasten into the heads of the yokes. Thus retained, when any one of the bolts  $b^{15}$  is loosened the arm  $b^5$  retained by it may be moved longitudinally or turned laterally around the shank of the bolt whereupon the socket-bearing arm and socket carried by it may be moved to any desired position of lateral adjustment and maintained in such position upon again tightening the bolt. I prefer that the nut or bearing  $b^{16}$  upon which the arm rests may turn with the arm as it is turned around the shank of the bolt. Accordingly there extend upwardly from the nut or bearing  $b^{16}$  flanges  $b^{17}$  which embrace the arm on either side thereof. I prefer also that a washer  $b^{18}$  may be interposed between the head of the bolt and the top surface of the arm. In order that this washer may not turn on the bolt independently of the arm it is made square and arranged between ribs  $b^{19}$  extending from the top surface of the arm at points just adjacent to opposite side edges of the washer.

In Figs. 10 and 11 no washer is shown, the head of the bolt bearing directly against the top surface of the arm on either side of the slot formed in it, the head being wider than the slot in the arm.

Again referring to Fig. 8, reference will

now be made to the means there shown by which the sockets C may be secured to the socket-bearing rods. In Fig. 3 the sockets are shown held by the rods by the simple thrusting of the rod into the socket; in other words, the rod is made slightly larger than the interior of the socket yet so that the rod may be forced into the socket when a frictional engagement is secured between the parts. The disadvantage of such an engagement is that it is sometimes hard to withdraw the rods from the sockets after the tie has been formed. Accordingly the means shown in Fig. 8 is especially designed to afford a means by which the sockets may be secured to the rods and the rods be easily detachable therefrom after the molding of the tie.  $b^{20}$  represents a rod of a size to extend into the interior of the socket and have a normal easy fit within it without binding against the interior wall of the socket. The end of the rod or that portion thereof located within the socket is made split and it is my object to expand this split end of the rod to bind against the interior of the socket. For this purpose the split end of the rod is made chambered for receiving the enlarged end or head  $b^{21}$  of an auxiliary rod  $b^{22}$  which extends through the hollow interior of the main rod and is slidable longitudinally within it. Now the passage through the main rod in which the auxiliary rod  $b^{22}$  is located is smaller than the chamber containing the head of the auxiliary rod, the chamber contracting into the passage through the main rod by an inclined or beveled edge  $b^{23}$  to engage which the head  $b^{21}$  of the auxiliary rod is correspondingly beveled by an edge  $b^{24}$ . Now the split in the end of the main rod extends for some little distance above the chambered portion thereof containing the head  $b^{21}$  so that upon draft applied to the auxiliary rod  $b^{22}$  the head will be drawn against the inclined or beveled portion  $b^{23}$  of the main rod forming the contracting end of the chamber whereupon the split end of the rod will be expanded. Draft may be applied to the auxiliary rod by extending the same above the end of the main rod, threading this extended portion and locating thereon a thumb screw  $b^{25}$  which bears against the top end of the main rod. Upon turning the thumb screw the auxiliary rod will be drawn through the main rod, expanding it as above described, or, by turning the thumb screw in a reverse direction, it will be turned away from the end of the main rod, when the auxiliary rod may be moved in a reverse direction and the rod forced away from its engagement with the main rod, allowing the expanded portion thereof to resume its normal position, when the rod can be easily drawn out of the socket.

In referring to the operation of molding

the tie, it will be understood that in the first instance the cross pieces  $a^4$  are applied to the tie and also to the yokes B and connecting parts for supporting the sockets, the sockets being located in properly adjusted positions. Thereupon the mold is filled with cement or concrete up to a point flush with the top edges of the side and end portions of the mold and the mass left to harden. After it has hardened the yokes are loosened from the mold and the socket-carrying rods carried by the yokes released and drawn out of the sockets. The pieces  $a^4$  are then removed when the hardened concrete mass or tie may be turned out simply by inverting the mold. In order that the mold may easily be inverted there are provided handles  $a^5$  at either end which connect with the sides of the mold.

In connection with the delivery of the tie from the mold, after the tie has been formed, I have shown in Fig. 6 a slightly modified construction of mold in the fact that it is made in two halves,  $a^7$ ,  $a^8$  hinged together by a hinge  $a^9$  running along the center of the base of the mold, the two halves of the mold being held together by the yokes B before described, supplemented by clamps  $a^{10}$  attached to the ends of the mold. After the tie has been formed these clamps are removed as are also the yokes when the mold may be broken apart along the line of its hinge, releasing the tie.

In connection with the molding of the tie, I would further explain that it is desirable that the holes formed in the tie by the sockets should be continued through the tie in order that dirt or other matter may not collect in the sockets, which of course would interfere with a proper entry of the fastenings into the sockets. Accordingly when the mold is formed plugs C<sup>1</sup> are placed in the ends of the sockets which extend down to the bottom of the mold. After the tie has been formed and the rods bearing the sockets have been removed these plugs may be driven out of the tie leaving the socket openings to extend clear through the tie.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States:—

1. A mold of the character specified the body of which is shaped to form a tie when filled with a plastic mass, and in combination with the body of said mold socket-bearing members extending into the cavity of the mold and supporting sockets in the plastic mass when filled into the mold whereby said sockets may become set upon the hardening of said mass, brackets in which said members are vertically adjustable, and means for supporting said brackets whereby they may be laterally adjustable.

2. A mold of the character specified the body of which is shaped to form a tie when

filled with a plastic mass, and in combination with said body of the mold a yoke, means for detachably securing said yoke to the body of the mold whereby it may extend over the cavity therein, brackets adjustably secured to said yoke whereby they may be laterally adjustable, and rods vertically adjustable in said brackets and adapted to extend down into the cavity of the mold for supporting therein sockets to be molded in said plastic mass.

3. A mold of the character specified the body of which is shaped to form a tie when filled with a plastic mass, and in combination with said body socket-bearing members extending into the cavity of said mold for supporting sockets in said plastic mass when filled into the body of the mold whereby said sockets may become set upon the hardening of said mass, said socket-bearing members comprising rods adapted to be expanded into said sockets for firmly holding the same or from which sockets said rods may be withdrawn upon the contraction

thereof, and means whereby said rods may be expanded or contracted.

4. A mold of the character specified shaped to form a tie when the body of said mold is filled with a plastic mass left to set or harden therein, and in combination therewith means whereby sockets may be molded in said tie, said means-comprising in part sockets, rods bearing said sockets for holding the same in said plastic mass during the filling of the same into the mold and the hardening of said mass, each of said rods having a split end by which it may be expanded into said socket or be allowed to contract when said rod may be easily withdrawn from said socket, and means within said rod operatable from the outside thereof for expanding the split end thereof or allowing the same to contract as occasion may require.

HERBERT ELMER PERCIVAL.

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ALEX. KELLER.