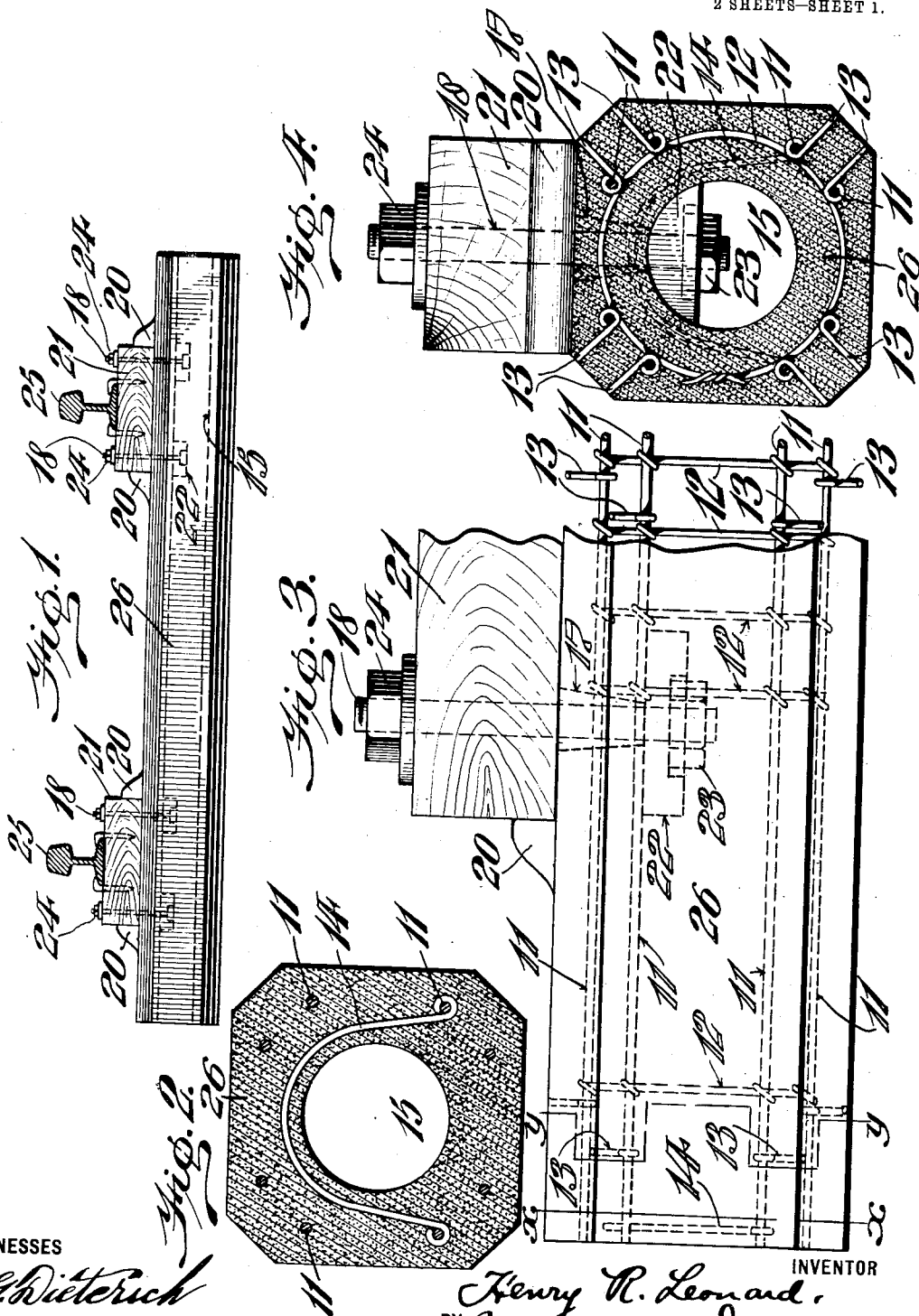


H. R. LEONARD.
METHOD OF MAKING HOLLOW REINFORCED CONCRETE TIES.
APPLICATION FILED SEPT. 27, 1911.

1,039,552.

Patented Sept. 24, 1912.

2 SHEETS—SHEET 1.



WITNESSES

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L. Cowell.

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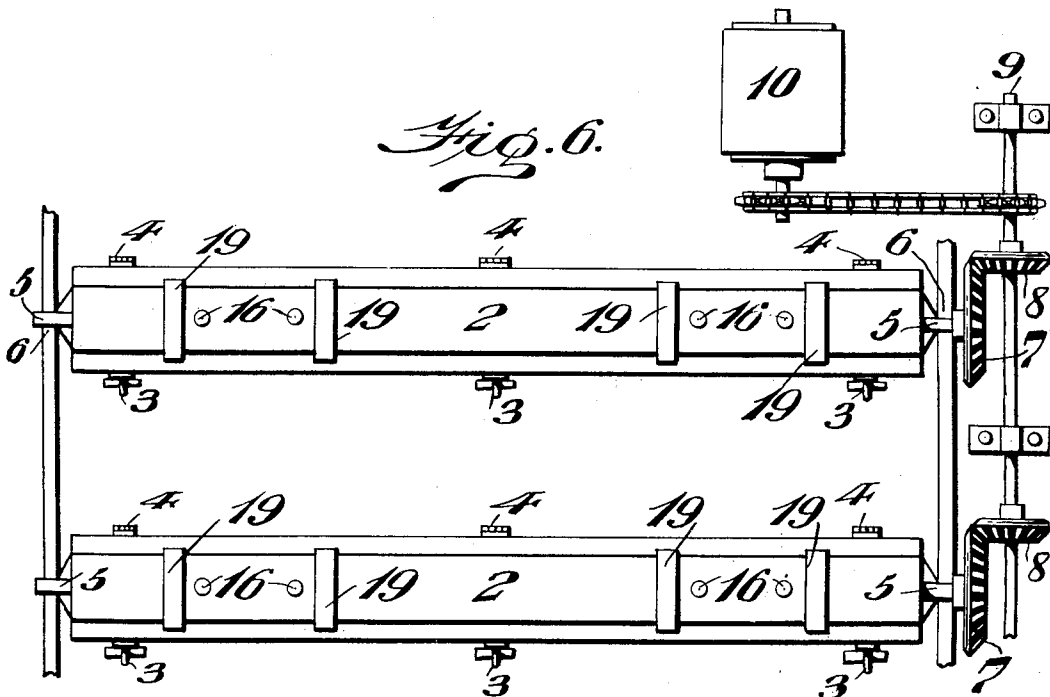
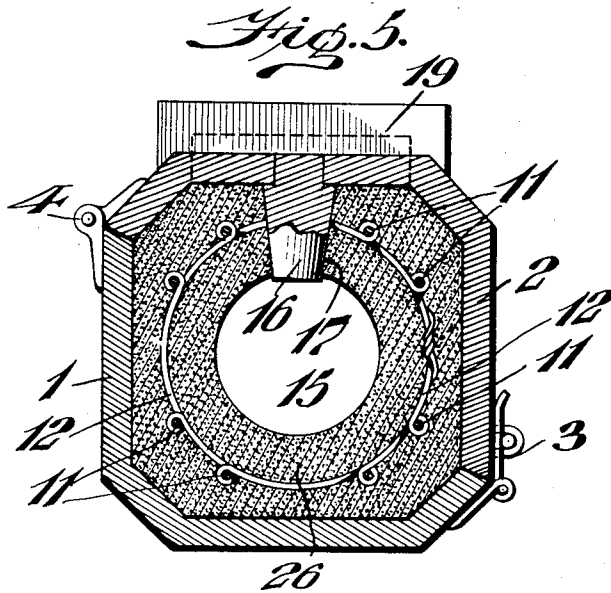
ATTORNEYS

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WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY R. LEONARD, OF WAYNE, PENNSYLVANIA.

METHOD OF MAKING HOLLOW REINFORCED-CONCRETE TIES.

1,039,552.

Specification of Letters Patent.

Patented Sept. 24, 1912.

Application filed September 27, 1911. Serial No. 651,561.

To all whom it may concern:

Be it known that I, HENRY R. LEONARD, a citizen of the United States, residing in Wayne, county of Delaware, State of Pennsylvania, have invented a new and useful Method of Making Hollow Reinforced-Concrete Ties, of which the following is a specification.

My present invention relates to a novel method of producing a hollow reinforced concrete tie for railroad purposes, and in its broad and generic scope consists of a novel method wherein the reinforcements and the concrete, the latter either in the form of a concrete mixture or the ingredients thereof, are placed within the mold which is then caused to revolve whereby owing to the centrifugal action, a very dense, durable and true surface is provided on all the outer surfaces of the tie.

It further consists of a novel method of producing a hollow reinforced concrete tie wherein the necessity of employing a core for the longitudinal aperture is entirely dispensed with and the apertures for the fastening devices are formed in the tie during the revolution of the mold.

My invention further consists of a novel method of producing a hollow reinforced concrete tie wherein metal reinforcements are suitably spaced within a mold, such reinforcements, including a metal reinforcement at the ends of the tie to prevent injury thereto by the engagement of the lifting jacks with the walls of the aperture, the mold being formed in such a manner that the concrete mixture, when set, after the mold has been revolved for a predetermined interval, will provide lugs which prevent the lateral movement of the chairs on which the rails are carried.

My invention further consists of a novel construction of a hollow reinforced concrete tie.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same will give in practice satisfactory and reliable results; although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not

limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a side elevation of a hollow concrete tie embodying my novel method. Fig. 2 represents a section on line $x-x$ Fig. 3, on an enlarged scale. Fig. 3 represents a side elevation on an enlarged scale of my device, certain parts thereof being broken away for clearness of illustration. Fig. 4 represents a section on line $y-y$ of Fig. 3. Fig. 5 represents a transverse section of my device, showing in addition a portion of the mold. Fig. 6 represents a plan view of one type of a mold and driving mechanism therefor, by the employment of which my novel method may be carried out.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings: the type of mold employed in carrying out my invention is immaterial, and a great many different constructions may be employed, and in order to illustrate one type of a mold which may be advantageously used, I have shown in Fig. 5 a mold consisting of two parts 1 and 2 which are adapted to be secured together by means of suitable fastening devices 3, the parts of the molds being hinged together as indicated at 4. Any desired number of molds may be employed and each mold is provided with trunnions 5 mounted in suitable bearings 6, said trunnions having thereon gears 7 which mesh with gears 8 on a line shaft 9, which latter is driven by any suitable means, such as, for example, the electric motor 10, which is operatively connected therewith in any desired manner.

11 designates longitudinal extending reinforcements, any desired number of which may be employed, and which are suitably spaced from each other.

12 designates annular reinforcements which preferably are bent around the longitudinal extending reinforcements 11, as is best seen in Fig. 5, and the free ends of the annular members 12 are secured together in any desired manner.

13 designates spacing members which are bent around the longitudinal extending members 11 and then extend angularly outwardly, as will be understood by reference to Fig. 4, so that when the reinforcements are placed in position in the mold, the same will be suitably spaced relatively to the

inner walls of the molds, the contour of which latter may vary as desired, and the same may have a rectangular, square, polygonal, or any other desired contour.

14 designates a reinforcement which is placed in proximity to the end of the tie, as will be best understood by reference to Fig. 3, and which as best seen in Fig. 2, extends over the aperture so that when the lifting jacks are employed to raise the tie from its bed, the structure will be properly reinforced at such points, and, in the present instance, for the purpose of illustrating one manner of locating these reinforcements, I have shown the reinforcing bar 14 as surrounding the upper portion of the aperture 15 and has its free ends bent around the longitudinal extending bars 11, as seen in Fig. 2.

One portion of the mold, in the present instance the portion 2, is provided with a core member 16 so that the apertures 17, through which the fastening devices 18 pass will be formed in the tie during the revolution of the mold. The mold is provided on one of its faces with a desired number of recesses 19 which provide for the formation of the lugs 20 which serve to prevent lateral movement of the chairs 21 which latter may be of wood, metal or any other desired material.

22 designates gibs of wood, metal or other desired material, the contour of which conforms to the inner walls of the aperture 15 through which the fastening devices 18 pass, which latter are provided with suitable nuts 23 and 24 whereby the chairs will be properly secured with respect to the tie.

25 designates the rails which are secured to the chairs 21, in any desired or conventional manner.

26 designates the completed tie.

In carrying out my novel method, the metal of other reinforcements, secured together in any desired manner, are placed within the mold, after which the same is closed and the concrete mixture, either as a mixture or the ingredients thereof, is placed within the mold, after which the same is sealed. The motor 10 is shown set in motion, whereupon the shaft 9 will be rotated thereby causing the rotation of the mold, the speed of rotation of which will vary in accordance with the conditions and requirements of the case. Owing to the centrifugal action within the mold the heavier particles of the concrete mixture will tend to travel outwardly and toward the inner walls of the mold, the result of which will be that the concrete will be denser and harder near the outer faces of the tie being formed than at the inner portion thereof, which is desirable in articles of this character in order that the tie will not be injured by the bearing of the rails and

the tamping of the ballast. After the mold has been rotated for the requisite time to cause the concrete mixture to assume the proper density at the outer positions thereof, and the concrete mixture has begun to set, the rotation of the mold may be arrested and after the concrete is set, the shrinkage is sufficient to loosen the same from the walls of the molds, the fastening devices 3 are then unfastened, whereupon the mold member 2 may be moved relative to the mold member 1 owing to the manner in which it is hinged at 4, so that the core 16 is removed, thereby providing apertures 17 through which the fastening devices pass, as already described.

By my novel method the outer portion of the tie will be of greater density than the inner portion thereof, the result of which is to greatly lengthen the life of the tie and to reduce to a minimum the liability of the tie becoming injured by the contact of foreign material thereagainst.

In so far as I am aware, I am the first in the art to devise a method of making a concrete tie, wherein the same is produced by centrifugal action of the material, and the tie is formed of greater density at the outer portions than at its inner portions and wherein the apertures, through which the fastening devices for securing the chair in place pass, are formed in the tie, during the rotation of the mold, and wherein the longitudinal extending aperture is formed by the centrifugal action imparted to the concrete mixture, and also wherein provision is made at the ends of the tie to prevent the walls of the aperture being injured by the lifting jacks, and it is to be understood that my claims to such features are to be interpreted with corresponding scope.

While I have shown in the present instance a preferred manner of forming and placing the reinforcements, it is to be understood that in the broad scope of my invention, these reinforcements may be located and spaced in any desired manner and still be within the scope of my invention.

It will now be apparent that I have devised a novel and useful construction of a method of making a hollow reinforced concrete tie which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described a preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention, 130

what I claim as new and desire to secure
by Letters Patent is:—

5 The method of making a hollow concrete
tie, which consists in forming a mold with
two recesses near each end to form rail
chair spacing lugs, placing reinforcements
within the mold and spacing them from the
inner walls thereof, securing to such rein-
10 forcements additional reinforcing elements
extending at each end across the top of the

aperture to be formed, placing a concrete
mixture in the mold, rotating the mold, ar-
resting the rotation of the mold, and lastly
removing the concrete tie thus formed from
the mold.

HENRY R. LEONARD.

Witnesses:

H. S. FAIRBANKS,
C. D. McVAY.