106-99 CROSS REFERENCE EXAMINEI

Dec. 22, 1925. 1,566,550

J. E. McWILLIAM

RAILROAD TIE

Filed Jan. 16, 1925

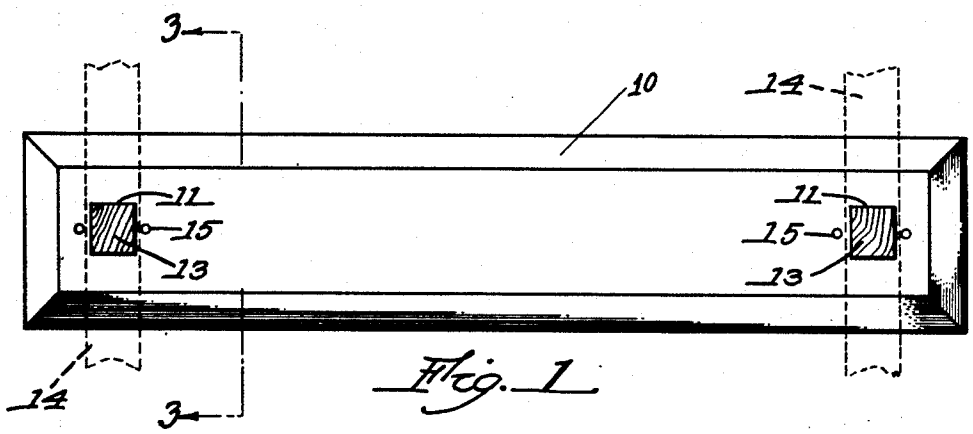


Fig. 1

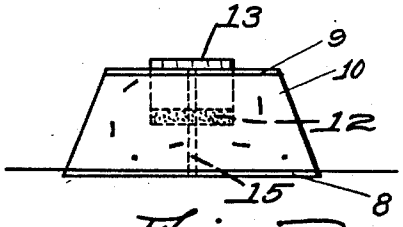


Fig. 2

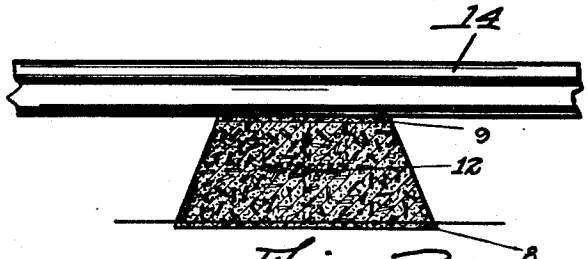


Fig. 3.

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UNITED STATES PATENT OFFICE.

JAMES E. McWILLIAM, OF NORTH OXFORD, MASSACHUSETTS.

RAILROAD TIE.

Application filed January 16, 1925. Serial No. 2,936.

To all whom it may concern:

Be it known that I, JAMES E. McWILLIAM, a citizen of the United States, residing at North Oxford, in the county of Worcester and State of Massachusetts, have invented a new and useful Railroad Tie, of which the following is a specification.

This invention relates to a sleeper or tie for railroad beds and to other heavy supporting elements.

The principal objects of the invention are to provide a durable tie which will not have the rigidity of solid concrete, but yet will have its lasting qualities, and also to provide a sleeper or tie which can be produced independently of the lumber market and be made of materials that are comparatively inexpensive and are certain to remain inexpensive, at least for a long period to come.

I am aware of the fact that many forms of concrete ties have been invented and tried, but so far as I know, they have all been open to the objection that in use they produce so much noise as to render them practically useless on that account; and further on account of their rigidity they cause other difficulties, particularly in the manner of fastening the rails, and even in the fatigue of the rails themselves, and that they are generally regarded as impractical for this purpose. It is for that reason that I have devised a sleeper or tie formed largely of concrete and having the durability thereof, but yet of such a flexible nature that the difficulties heretofore encountered with concrete ties are not met with in this case.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a plan of a concrete tie showing the position of the rails thereon and constructed in accordance with this invention;

Fig. 2 is an end view of the same; and

Fig. 3 is a sectional view on the line 3—3 of Fig. 1.

One of the minor objects of this invention is to provide a market for certain kinds of material which are now entirely wasted in this country and which occur in abundance and can be purchased now, and far into the future, for comparatively small sums. One of the ingredients of the improved tie is produced by taking brush-wood and limb wood of fine or coarse character and of any kind or any species that happen to be available and cutting them up in a machine into lengths of say from one to four inches, so that they can be handled readily with a scoop or shovel. Preferably these pieces also are put through a stone crusher or other crushing machine so as to reduce them to fragments or shred them roughly. The pieces of wood which can be treated in this way can be small branches, called brush, but limb wood even several inches in diameter can be worked up in this manner so as to produce a mass of twigs and shreds of limbs or branches that can be handled conveniently. When used in the manner to be described this material will furnish fibers and sticks to tie together the concrete structure into which it is to be placed, thus adding to its strength. This material is mixed with cement and sand in a mixing machine and poured into a mold to produce the desired form of sleeper or foundation. By the mixing operation each shred and twig of wood is entirely covered with the concrete and when poured into the mold the concrete settles all around and between the small particles of wood and forms a solid body of concrete in which the wood is encased. The pieces of wood extend through it in every direction, no attempt being made to control the lie of the wood pieces therein. The idea of this is not only to tie the cement by the wooden shreds and twigs but especially to relieve the cement from its rigidity and deaden the sound of vibration, which is the quality which has prevented its use for this purpose before and to make use of the otherwise wasted wood-stock which exists in this country in large quantities.

Although the ties can be made of this mixture as above described, I will describe a preferred embodiment of the invention and process of preparation which has all the qualities mentioned and some others. This consists in mixing two parts by volume of cement, three parts sand, one part lime, three parts the wood material above described, and three parts old rubber. The old rubber can consist of rubber tires, boots or other waste rubber broken up and shredded in machines which are now in existence for that purpose. In fact, it may contain in addition to the rubber fabrics, cord and felt that is in the rubber itself, as well as particles of rope, twine, leather and other tough but yielding materials, preferably of a fibrous nature. These materials are

thrown into a cement mixer, supplied with the necessary amount of water and mixed up thoroughly so that every particle of wood, rubber and fibrous material of all characters is thoroughly coated and soaked with the cement in a liquid state and also surrounded by a body of that material in the mixer. The cement in the concrete mixer is then poured into molds for the production of the sleepers or ties. As described above, this produces a product which is of the nature of concrete because air and moisture cannot get to the materials inside. These are arranged at all angles and in all directions within the article and they tend to add a degree of elasticity which renders the product comparable to a log of wood or to the ordinary wooden sleeper now in use. It absorbs the ordinary vibration and sound and does not weaken under constant blows such as these articles are subjected to in practice. Although any particle of rubber, for instance, which may lie along the surface might be attacked by acids or moisture in the course of time that results only in producing a small weak spot near the surface and cannot seriously weaken the tie itself. The parts inside are absolutely protected from such action and will last as long as the concrete which is practically indestructible by the elements. When a train passes over a track supported by such ties there is no more noise than if it were supported by wooden sleepers, the vibration is absorbed and there is no discomfort to the passengers on the train. The ties do not have to be replaced at frequent intervals as is now the case and the danger of their deterioration and resulting expense therefrom is reduced to a minimum.

A sleeper 10 constructed in accordance with this invention can be made in many forms but in the drawings I have illustrated a preferred form in which the sleeper is cast bottom side up in a mold and is so shaped that it tapers on the ends and sides outwardly toward the bottom which rests in the soil. This flared bottom is a matter of some importance because resting as it does in the ground, it furnishes an additional cushion.

In constructing this sleeper, I prefer to cast a layer of plain concrete 9 in the bottom of the mold before casting the tie and a similar layer 8 on top afterwards to provide two smooth surfaces. I also cast two cavities 11 in the upper surface thereof, that is, the bottom surface while it is in the mold. At the bottom of each cavity I place a layer 12 of yielding material such as either live or old rubber, felt, leather waste or the like. On this I place a wooden block 13 fitting in the cavity and originally projecting a little above the upper surface of the tie. This wooden block is made with the grain vertical to secure maximum durability and strength against pressure and when the rails 14 are placed in position they will rest on these blocks. Through the sleeper I cast holes 15 through which bolts are placed to hold down the usual rail clamps. The rails are clamped down on the block and brought into contact with the upper surface of the sleeper. In this way the rails themselves prevent the entrance of moisture into contact with the wooden blocks 13 and into the openings or depressions 11. Therefore they will last as long as the tie or at any rate as long as the rail and can be inspected when a new rail is laid.

This furnishes a wide wooden surface at the bottom of the rail which becomes a cushion and reduces the chance of the tipping of the rails sideways. It constitutes a shock absorber because whenever a blow is struck on top of the rail and the rail reacts upwardly, this block, due to the spring material 12 below, will follow the bottom of the rail and keep in close contact with it at all times. Thus the noise is obviated. Nevertheless the rail normally rests, on both sides of the block and, in fact, all around it, on the concrete where it has a solid support, but the concrete as described above also has sufficient resiliency to prevent the difficulties due to vibration that has been described above.

In the manufacture of the concrete block, the date or any other data can be cast on it easily while it is being made, as is well understood.

Although I have described this invention as applied to the manufacture of railroad ties or sleepers, I am aware of the fact that it can be used for other supporting elements as foundations for buildings or machinery and in general in all places where a concrete support is desired, with a reduction in cost and an increase in the utility thereof. It is particularly valuable for foundations for large machinery where the vibration of the running machine is absorbed to a large extent and the noise of its operation reduced.

Although I have illustrated and described only a single article and only one specific composition for its manufacture, I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited in these respects but what I do claim is:—

1. As an article of manufacture, a railroad tie consisting of cement and pieces of wood cut up into short lengths mixed intimately with the cement and located throughout the body thereof in the finished article with the grain extending in all directions therein.

2. As an article of manufacture, a con-

crete railroad tie formed of cement, sand, wood in small pieces and shredded rubber in approximately equal proportions.

3. As an article of manufacture, a railroad tie consisting of a solid block of concrete mixture and having a wood block at each end for receiving the pressure of the rails to be laid thereon but of less width than the base of the rail so as not to take all the weight of the rails off the concrete composition tie, said blocks of wood being arranged with the grain vertical to better resist crushing and other strains, and a piece of yielding material under each block to permit the block to be forced back into contact with the top of the tie by the pressure of the rail.

In testimony whereof I have hereunto affixed my signature.

JAMES E. McWILLIAM.