SELF-LOCKING SPIKE

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This invention pertains to an improved type of spike, particularly adapted for use as a railroad spike in fastening tracks to ties or other supporting means, the spike of this invention being characterized by the provision of means whereby the spike may be readily driven and automatically anchored or locked into position so that it can not be removed and will resist dislodgment or loosening due to vibration, the stresses of normal use, etc.

Hereinafter it has been recognized that railroad spikes have a tendency to work their way loose out of the ties into which they are driven, the holding power of the spike being dependent entirely upon the compressive action of the surrounding timber upon the shank of the spike. Inasmuch as normal spikes become loose, the railroads are forced to employ large numbers of men and constantly patrol the thousands of miles of trackway, inspecting the spikes, driving them home in the event they have worked loose, and replacing many spikes by either removing older spikes or by driving new spikes in new positions, so as to permit a new or therefore unused portion of the tie to grasp a spike. Only a limited number of spikes may be driven into a tie before the area of the tie adjacent the track is so perforated as to be useless as a holding means for the spike. When this happens, it is necessary to remove the entire tie and start afresh.

Hereinafter complex methods and means have been devised in an attempt to solve this difficulty. The present invention is directed toward an improved type of spike which is self-locking and which is actuated by the material into which the spike is driven. If, therefore, the spike is driven into a wooden tie, the wood itself causes the spike to lock itself within the tie so as to effectively resist withdrawal or loosening. By the use of these spikes, a safer road bed is obtained and the necessity for constant inspection does not exist. The life of the tie is prolonged indefinitely since two spikes may be used effectively for a much longer period of time than that normally experienced by the use of even four of the normal spikes hereinafter employed.

Generally stated, therefore, the invention pertains to a self-locking spike provided with an extensible locking arm and with means actuated by the material into which the spike is driven for moving the locking arm into extended position beyond the sides of the shank of the spike and for holding the arm in such extended position so as to prevent withdrawal of the spike.

An object of the present invention, therefore, is to disclose and provide a self-locking spike adapted to resist dislodgment.

A further object is to disclose and provide a railroad spike provided with means adapted to extend in a direction transverse to the axis of the spike into the material into which the spike is driven.

A further object is to provide a self-locking spike including a locking arm adapted to swing outwardly from the spike into the material into which the spike is driven and means for holding the arm in such extended position.

Moreover, an object of the invention is to disclose a self-locking spike which is actuated by the material into which the spike is driven.

Other objects, advantages and uses of the invention will become apparent to those skilled in the art from the following description. In order to facilitate understanding, reference will be had to the appended drawing, in which:

Fig. 1 is a perspective view of one form of spike embraced by this invention, this view showing the locking arm in extended position.

Fig. 2 is a side elevation of the spike.

Fig. 3 is a side elevation of the spike after it has been driven into a tie.

Fig. 4 is an end elevation.

As shown in the drawing, the spike may include a shank 10 provided with a head 11 at one end and a wedge end portion 12 terminating in a sharp edge 13. In the form illustrated, the shank is provided with four sides 14, 15, 16 and 17. The sides 14 and 15 converge at the lower end to form the sides of the wedge 12. The sides 16 and 17 are substantially parallel throughout their length. The length of the edge 13 is therefore equivalent to the base of the wedge.

The shank 10 is provided with a slot 20 extending from one side to the other. Preferably the slot 20 extends from one of the parallel sides 16 to the other side 17 and is therefore parallel to the edge 13 of the wedge. A bore 21 extends longitudinally of the spike from the edge 13 to the bottom of the slot 20.

Pivotally mounted within the upper portion of the slot 20 is a locking arm 22 which may be pivoted as at 23. The locking arm 22 is preferably adapted to rest on the bottom of the slot 20 within such slot, the height of the slot and the length of the arm 22 being such as to permit the locking arm 22 to extend outwardly to an appreciable distance beyond the side 16 of the spike. In the lower portion of the slot a latch dog 24 is provided, pivoted as at 25, such latch dog being adapted to cover the bore 21 in the bottom of
the slot and to swing upwardly so as to engage the detents or teeth 26 and 27 formed in the lower surface of the locking arm 22.

When the spike is driven into a wooden tie or other material the inclined faces of the wedge 5 displace the material in the manner shown in Fig. 4. The substantially parallel sides 16 and 11, however, exert a shearing action upon the wood and the grain or end fibres of the wood are not deflected to any material extent. The sharp lower edge of the bore 21 cuts a column of wood and this column forces its way upwardly through the bore into contact with the latch dog 24. A column of wood is indicated at 30 and as shown in Fig. 3, this column of wood, produced by driving the spike into the tie, raises the latch dog 24 which in turn raises the locking arm 22. As the locking arm 22 is raised, it protrudes beyond the side of the spike and engages the tie.

Toward the conclusion of the driving operation the column of wood which is emitted by the bore 21 forces the latch dog 24 into locking engagement with the detents 26 and 27 into the position shown in Fig. 3.

The distance from the edge 13 of the wedge to the bottom of the slot and the height of the slot as well as the length of the locking arm 22 bear a predetermined and desired ratio to the length of the spike from immediately beneath its head 11 to the top of the slot 20. These lengths are so proportioned that the locking arm 22 becomes fully extended and locked into extended position just as the spike is driven home, and this is usually attained by making the distance from the head to the top of the slot 20 slightly shorter than the distance from the top of the slot to the edge 13.

The sharpness of the point on arm 22 may influence the rapidity with which it is extended after it first engages the wood of the tie. If this point on arm 22 is not sharp, the wood column may more fully fill slot 20 before the arm is extended.

Fig. 3 shows the position of the elements when the spike has been fully driven and it is to be observed that the locking arm 22 is fully extended into the wood of the tie and presents a bearing surface which is transverse to the vertical axis of the spike. The spike therefore cannot be readily withdrawn since the locking arm 22 is locked in this extended position by the dog 24.

In order to prevent the locking arm and dog 24 from unduly vibrating or accidentally jumping out of the slot 20 during initial driving of a spike, a thin wire or spring may be placed around the arm and dog so as to hold the two together as indicated at 31. This frangible member 31 is readily broken as soon as the column of wood 30 begins to raise the dog 24.

It will be readily appreciated that these and other changes may be made from the specific construction described in detail hereinabove without departing from the spirit of the invention. All changes and modifications coming within the scope of the appended claims are embraced thereby.

I claim:
1. A self-locking spike comprising: a shank provided with four sides, a head at one end and a wedge-shaped end opposite said head, two of the sides of the shank converging at the wedge to form its edge, the other two sides being substantially parallel throughout their length; a slot extending through the shank from one of said parallel sides to the other in a direction parallel to the edge of the wedge; a longitudinally directed bore from the edge of the wedge to the bottom of said slot; a locking arm pivotally mounted in the slot and adapted to swing outwardly from within the slot to beyond the sides of the shank; and a latch dog pivotally mounted in the lower portion of the slot and extending over said bore, said dog being adapted to swing upwardly to engage said locking arm and hold the same in extended position.

2. A self-locking spike comprising: a shank provided with four sides, a head at one end and a wedge-shaped end opposite said head, two of the sides of the shank converging at the wedge to form its edge, the other two sides being substantially parallel throughout their length; a slot extending through the shank from one of said parallel sides to the other in a direction parallel to the edge of the wedge; a longitudinally directed bore from the edge of the wedge to the bottom of said slot; a locking arm pivotally mounted in the slot and adapted to swing outwardly from within the slot to beyond the sides of the shank; and a latch dog pivotally mounted in the slot and adapted to swing outwardly from within the slot to beyond the sides of the shank; and means movably positioned into which the spike is driven, said material extending through said bore, for moving the locking arm into extended position and for holding the same in such extended position.

3. A self-locking spike comprising: a shank provided with four sides, a head at one end and a wedge-shaped end opposite said head; a slot extending through the shank in a direction parallel to the edge of the wedge; a longitudinally directed bore from the edge of the wedge to the bottom of said slot; a locking arm pivotally mounted in the slot and adapted to swing outwardly from within the slot to beyond the side of the shank; and means movably positioned within the slot and actuated by material into which the spike is driven, said material extending through said bore, for moving the locking arm into extended position and for holding the same in such extended position.

4. A self-locking spike comprising: a shank provided with four sides, a head at one end and a wedge-shaped end opposite said head; a slot extending through the shank in a direction parallel to the edge of the wedge; a longitudinally directed bore from the edge of the wedge to the bottom of said slot; a locking arm pivotally mounted in the slot and adapted to swing outwardly from within the slot to beyond the side of the shank; and a latch dog pivotally mounted in the lower portion of the slot and extending over said bore, said dog being adapted to swing upwardly to engage said detents and hold the locking arm in extended position.

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