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A tamping tine for a tamping machine

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ABSTRACT

A tamping tine (4) has a flat inclined tine surface (3) which encloses an acute angle α with a plate front surface (1) of a tine plate (2). The inclined tine surface (3) is delimited, with regard to a longitudinal direction of the tine, on the one hand by a plate bottom edge (6) and, on the other hand, by a shank section line (22) formed by intersection with the entire shank rear portion (20). A reference line (15) located on the inclined tine surface (3) is distanced farther from an upper end point (A) – positioned at the greatest distance from the plate bottom edge (6) - of the inclined tine surface (3) than from a shank end line (11). This ensures both an easier penetration of the ballast by the tamping tine (4) as well as an improved attachment of hardened metal plates.

(Fig. 3)

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Fig. 1

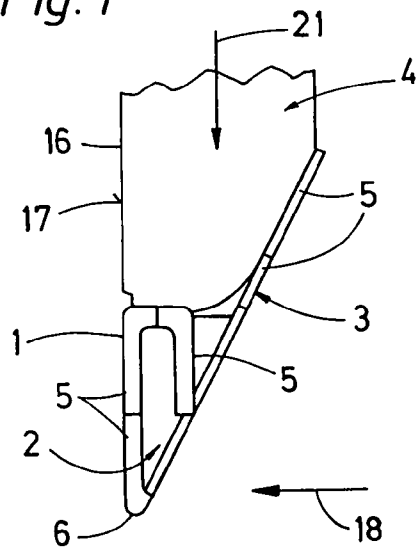


Fig. 2

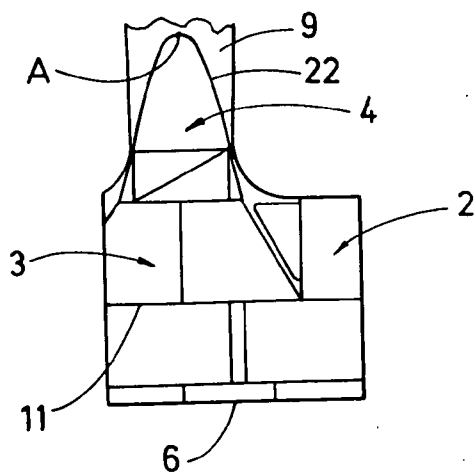
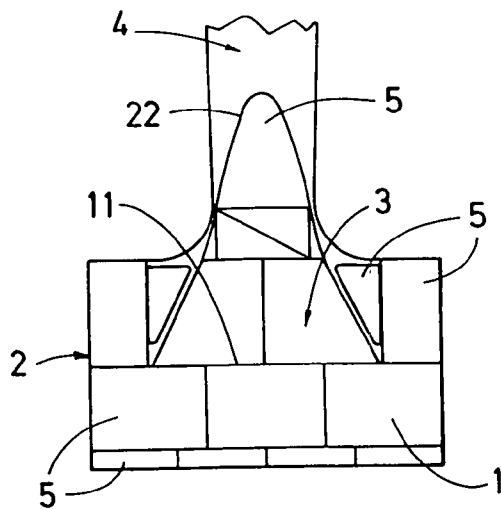


Fig. 6

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**COMPLETE SPECIFICATION
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Invention Title:

A TAMPING TINE FOR A TAMPING MACHINE

Our Ref : 682605
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The following statement is a full description of this invention, including the best method of performing it known to applicant(s):

The invention relates to a tamping tine for a tamping machine for tamping ballast present underneath a track, including a tine shank - having a shank front portion and a shank rear portion with respect to a tamping direction - and a tine plate which is positioned at the lower end of the tine shank and has a plate bottom edge distanced from the tine shank, the tine plate including a plate front surface arranged in front of a plate rear surface, wherein the tine shank and the plate rear surface form a common shank end line extending parallel to the plate bottom edge.

According to US 5 261 763, a tamping tine of this type is already known, with hardened metal plates being fastened to both the tine plate and the bottom end of the tine shank in order to optimize the resistance to abrasion. The bottom end of the tine shank is designed with an offset and has a step-shaped recess for receiving a tine plate.

The object of the present invention is to provide a tamping tine of the specified kind with optimal abrasion resistance and reduced resistance to penetration as caused by insertion into ballast.

According to the invention, this object is achieved with a tamping tine of the kind mentioned at the beginning by means of the features cited in claim 1.

Due to this combination of features, the lower end of the tamping tine can be designed in an extreme wedge shape for reduced insertion resistance. By extending the inclined tine surface to far above the upper edge of the tine plate, it is possible to minimize the entire cross-section of the tine shank without adversely affecting the required strength. Designing the inclined tine surface as a plane makes it possible in an advantageous way to avoid a bend line which would be exposed to increased abrasion.

Further advantages and features of the invention become apparent from the sub-claims and the drawing.

The invention will be described in more detail below with reference to embodiments represented in the drawing in which

Figs. 1 and 2 as well as 4 show a side view or back view, respectively, of a lower section of a tamping tine,

Fig. 3 shows a longitudinal section according to section line III in Fig. 4,

Fig. 5 shows a cross-section according to section line V in Fig. 4, and

Fig. 6 shows a back view of a variant of a tamping tine.

As can be seen in Figs. 1 and 2, a plate front surface 1 of a tine plate 2 as well as an inclined tine surface 3 of a tamping tine 4 are covered with hardened metal plates 5 in order to increase the resistance to abrasion. For better clarity, the hardened metal plates are not shown in the further Figs. 3 to 5.

The tine plate 2, having a plate bottom edge 6, merges into a tine shank 9 both in the region of a plate rear surface 7 as well as at an upper edge 8 of the tine plate 2. With respect to a tamping direction 18, the tine shank 9 comprises a shank front portion 19 and a shank rear portion 20. Tine plate 2 and tine shank 9 are forged in one piece.

The inclined tine surface 3 is composed of a lower section 10, formed by a lower part of the plate rear surface 7 - with regard to a longitudinal direction 21 of the tine -, and an upper section 12, separated therefrom by a shank end line 11 and delimited by a shank section line 22. In the shank rear portion 20, the shank section line 22 includes an upper end point A which is maximally distanced with regard to the plate bottom edge 6. The inclined tine surface 3 encloses an angle α of approximately 30° with the plate front surface 1. Said angle may expediently vary between about 25° and 35° . The inclined tine surface 3 forms a plane 13, meaning that each line positioned in the plane 13

and extending perpendicularly to the plate bottom edge 6 is shaped as a straight line.

A line of intersection between a reference plane 14, extending perpendicularly to the plate front surface 1 and through the upper edge 8 of the tine plate 2, and the inclined tine surface 3 is designated as reference line 15 (Fig. 4). The distance a of this line from the upper end point A is greater than a distance b between the reference line 15 and the shank end line 11. Expediently, this distance a may be greater by about 20% to 50%.

As is visible particularly in Fig. 4, the reference line 15 is designed to be shorter by at least 40% than the shank end line 11. From Fig. 5 it is evident that a distance c between the reference line 15 and the plate rear surface 7 is shorter than a thickness d of the tine plate 2. This results in a reduction of the cross-sectional area of the tamping tine 4 for enabling the same to be inserted into the ballast in an improved manner. From Figs. 1 and 3 it can be seen that the plate front surface 1 of the tine plate 2 and a limit line 16 of the tine shank 9 are arranged in a common plane 17.

In the version of a tamping tine represented in Fig. 6, the tine plate 2 is designed asymmetrically with regard to the tine shank 9.

The claims defining the invention are as follows:

1. A tamping tine for a tamping machine for tamping ballast present underneath a track, including a tine shank - having a shank front portion and a shank rear portion with respect to a tamping direction - and a tine plate which is positioned at the lower end of the
5 tine shank and has a plate bottom edge distanced from the tine shank, the tine plate including a plate front surface arranged in front of a plate rear surface, wherein the tine shank and the plate rear surface form a common shank end line extending parallel to the plate bottom edge, characterized by the following features:
 - a) an inclined tine surface enclosing an acute angle α with the plate front surface and forming a plane, the inclined tine surface being delimited, with respect to a longitudinal direction of the tine, on the one hand by the plate bottom edge and, on the other hand, by a
15 shank section line formed by intersection with the entire shank rear portion;
 - b) a reference line located on the inclined tine surface and being formed, on the one hand, by a reference plane extending perpendicularly to the plate front surface and through an upper edge
20 of the tine plate and, on the other hand, by the inclined tine surface, the reference line being distanced farther from an upper end point - positioned at the greatest distance from the plate bottom edge - of the inclined tine surface than from the shank end line.
2. A tamping tine according to claim 1, characterized in that a
25 distance a, defined by the upper end point and the reference line, is greater by 20% to 50% than a distance b delimited by the reference line and the shank end line.
3. A tamping tine according to claim 1 or 2, characterized in that the angle α measures approximately 25° to 35°.
- 30 4. A tamping tine according to any one of claims 1, 2 or 3, characterized in that the inclined tine surface and the plate front surface are covered completely with hardened metal plates.
5. A tamping tine according to any one of claims 1 to 4, characterized in that the reference line is designed to be shorter by at

least 40% than the shank end line.

6. A tamping tine according to any one of claims 1 to 5, characterized in that a distance c between the reference line and the plate rear surface is shorter than a thickness d of the tine plate.

5 7. A tamping tine according to any one of claims 1 to 6, characterized in that the tine plate and the tine shank are forged in one piece.

8. A tamping tine according to any one of claims 1 to 7, characterized in that the plate front surface of the tine plate and a
10 front edge of the tine shank are arranged in a common plane.

9. A tamping tine for a tamping machine, substantially as hereinbefore described with reference to any one of the embodiments shown in the accompanying drawings.

DATED:

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Fig. 1

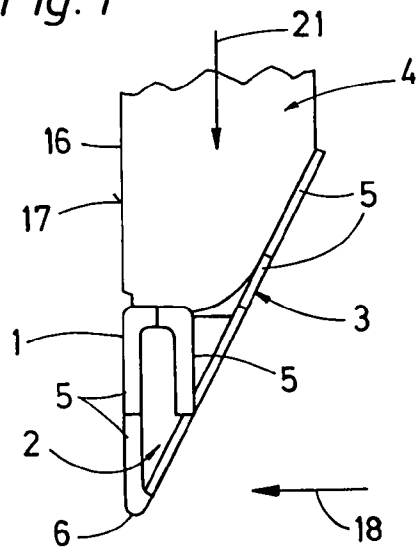


Fig. 2

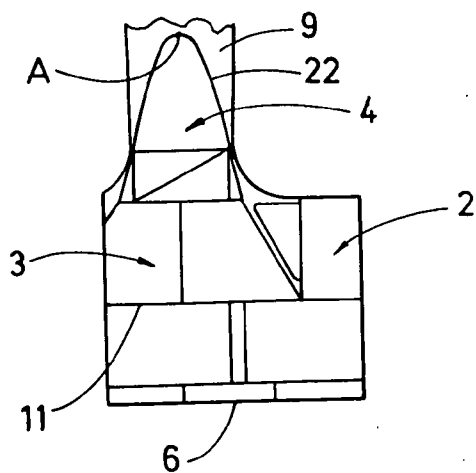
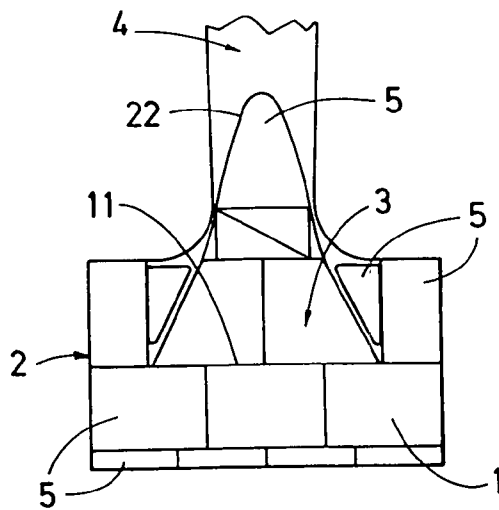


Fig. 6

