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TRACK TAMPING MACHINE

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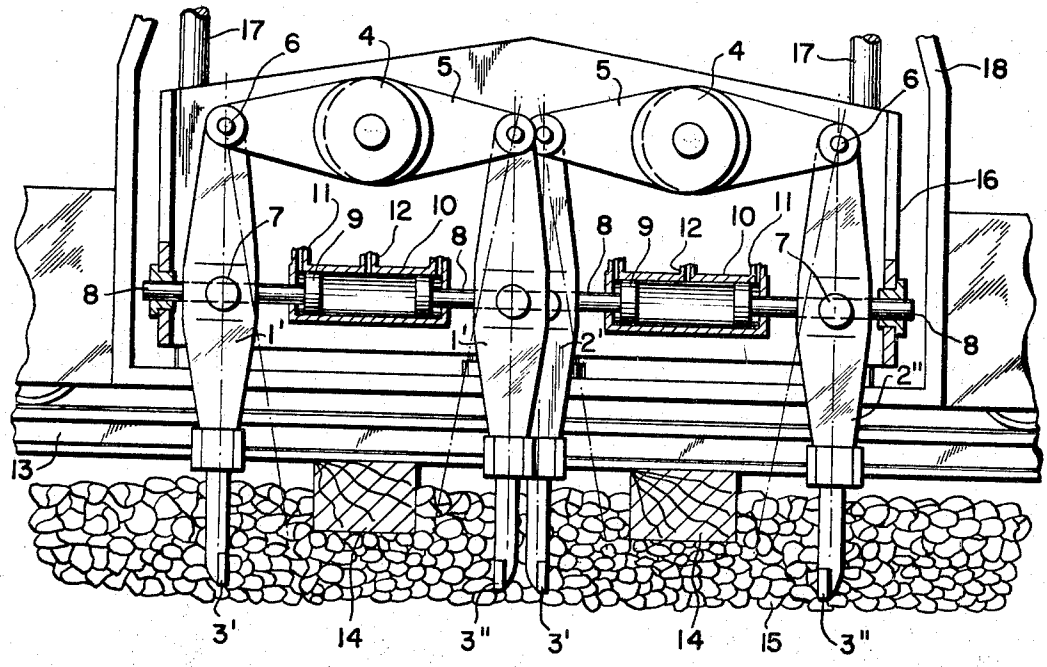

FIG.1

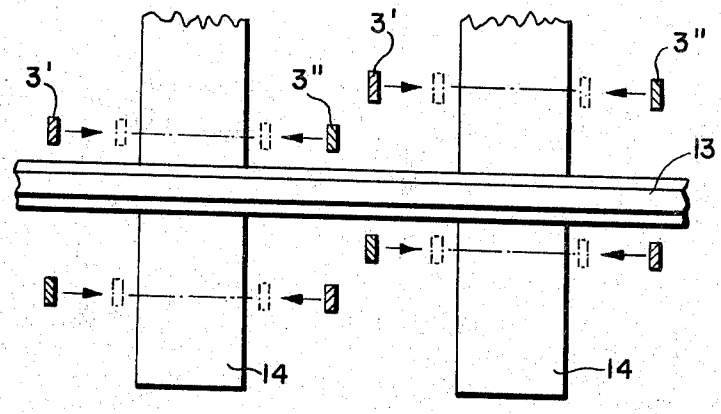

FIG.2

INVENTORS.
FRANZ PLASSER
JOSEF THEURER
By Kurt Kelman
AGENT

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TRACK TAMPING MACHINE

Franz Plasser and Josef Theurer, both of
Johannesgasse 3, Vienna, Austria

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ABSTRACT OF THE DISCLOSURE

A ballast tamping tool assembly comprising two adjacent pairs of tamping tools so spaced in the direction of track elongation that the adjacent tools of the adjacent pairs fit into the interspace between two adjacent ties. Preferably, the adjacent pairs of tools are staggered in the direction of the tie elongation.

The present invention relates to improvements of mobile track tamping machines, and more particularly to a novel tamping tool assembly.

Conventional track tampers comprise pairs of tamping tools arranged for immersion in the ballast adjacent the track ties, with the ties being positioned between the tools of each pair, and for reciprocation in the direction of elongation of the track so as to tamp the ballast underneath each tie when the preferably vibratory tools are moved together. In one such type of track tamper, the tamping tools are vertically adjustably mounted on a carriage frame which moves along the track for continuous tamping of one tie after another.

It is the primary object of the present invention to improve the efficiency of such track tampers by at least doubling the speed and/or producing a better quality of tamping.

This and other objects are accomplished in accordance with this invention by adjacently mounting two pairs of opposing tamping tools on the carriage frame and spacing the pairs of tools from each other in the direction of elongation of the track so that adjacent ones of the tools of the adjacent pairs are at a smaller distance from each other than the distance between adjacent ties whereby the adjacent tools may be immersed in the ballast between adjacent ones of the ties.

According to a preferred embodiment, one pair of tools is spaced from the adjacent pair of tools in the direction of elongation of the ties.

Such an arrangement not only doubles the work of the tamper in a given time but also produces a much more even and effective distribution of the ballast by the two tools operating in the same interspace between adjacent ties. Furthermore, such a tamper can be operated in alternative manners. On the one hand, two adjacent ties may be tamped at a time, i.e. each tie is tamped once, which doubles the distance covered by the tamper in a given time, as it proceeds along the track. On the other hand, the quality of tamping may be brought to an optimum by moving the tamper forwardly only from one tie to the next adjacent tie at any one time whereby each tie will be tamped twice and at points spaced from each other in the direction of elongation of the tie. This produces, of course, a more effective compaction of ballast underneath the tamped ties, which may be further improved by varying the tamping depth.

The above and other objects, advantages and features of the present invention will be more fully understood by reference to the following detailed description of a now preferred embodiment, taken in conjunction with the drawing wherein

FIG. 1 is a side view, partly in section, of an otherwise conventional track tamper incorporating the tamping assembly of this invention; and

FIG. 2 is a schematic top view showing the positions of the tamping tools of the assembly in relation to two adjacent ties.

As shown in FIG. 1, a tamping tool carrier **16** is slidably supported on posts **17, 17** mounted in carriage frame **18**. Cam shaft **4** is supported on carrier **16**, the shaft axis being parallel to ties **14** supporting the rails **13** of the track upon which the carriage of the machine travels. Upon rotation, shaft **4** imparts a vibratory motion to tamping tool mounting arms **5, 5**, the tamping tools **1', 1''** and **2', 2''**, respectively, being pivotally connected at their upper ends **6** to the outer end of mounting arms **5**. Intermediate their ends, the tamping tools are linked to a pivot pin **7**, which enables the tamping tools to be reciprocated in the direction of elongation of the track, all of the mounting and moving mechanisms for the tamping tools being generally conventional and having been fully disclosed, for instance, in our U.S. Patent No. 3,000,327, dated Sept. 19, 1961.

As shown, the lower end of each tamping tool replaceably carries respective tamping tool jaw **3', 3''** arranged for immersion in ballast **15** at each side of ties **14**. The ballast is packed or tamped under the ties **14, 14** when the two opposing vibratory tamping tools of each pair are moved toward each other, thus exerting pressure on the rocks and pebbles therebetween while the tools are simultaneously vibrated by rotation of cam shaft **4**. The tamping tool carrier **16** is vertically movable by adjustable support means (not illustrated in detail), whereby the immersion depth of the tamping tools in the ballast may be changed. When tamping of two ties is completed, the entire carrier is raised on posts **17, 17**, the carriage is moved on rails **13** to the next adjacent pair of ties and the operation is repeated there.

The tamping tools are connected at pivot **7** with piston rods **8** which are reciprocable in the direction of the track. Each rod carries piston **9** at its inner end, both pistons of each pair of tools gliding in common cylinder **10, 10** and thus dividing each cylinder into two outer chambers and a central chamber. When hydraulic pressure fluid is directed through conduits **11, 11** into the outer chambers of each cylinder, pistons **9** move toward each other and thus close tamping jaws **3', 3''** to effect the tamping operation. When pressure fluid, for instance compressed air, is applied through conduit **12** to the central chambers of the cylinders, the pistons and the tamping tools are pushed apart. Other suitable hydraulic motor means for reciprocating the tamping tools may be used, of course, and the present invention is concerned neither with the reciprocating nor the vibrating means for the tamping tools.

The improvement provided by this invention consists of mounting of two pairs of tamping tools in such spatial relationship that they are spaced from each other in the direction of elongation of the track, this spatial relationship being clearly shown in FIG. 2. Adjacent ones of the tools of adjacent pairs are at a smaller distance from each other than the distance between adjacent ties **14**, **14** whereby the adjacent tools of the adjacent pairs may be immersed in the ballast **15** between adjacent ties, i.e., in the same interspace between the ties. As appears clearly from FIG. 2, the preferred mounting of the pairs of tamping tools is such that the tools of one pair are spaced from the adjacent pair of tools in the direction of elongation of the ties. In this manner, the paths of reciprocation of each pair of tools are in different planes so that the adjacent tools of the adjacent pairs will not interfere with each other during reciprocation if these tools should be moved outwardly through a particularly large stroke.

While the invention has been described in connection with a single embodiment, it will be clearly understood any suitable means may be used for moving the tamping tools for effectuation of tamping and that, if desired, more than two adjacent pairs of tools may be mounted on a single carriage frame for simultaneous tamping of more than two adjacent ties. Thus, many variations and modifications may occur to those skilled in the art, particularly after benefiting from the present teaching, without departing from the spirit and scope of this invention as defined in the appended claims.

We claim:

1. An assembly for tamping ballast underneath a track including rails supported on a plurality of spaced ties resting on the ballast, said assembly comprising two adjacent pairs of tamping tools, said pairs of tools being spaced from each other in the direction of elongation of the track, the spacing between said pairs of tools being such that adjacent ones of the tools of the adjacent pairs may be immersed in the ballast in the interspace between said adjacent ties; and means for vertically adjustably supporting the tamping assembly on said frame for simultaneous raising and lowering of the two adjacent pairs of tamping tools.

2. The assembly defined in claim 1, wherein one of said pairs of tools is spaced from the adjacent pair of tools in the direction of elongation of the ties.

3. A machine for tamping ballast underneath a track including rails supported on a plurality of spaced ties resting on the ballast, said machine comprising a carriage frame; a track tamping assembly mounted on said frame and comprising two adjacent pairs of tamping tools, said pairs of tools being spaced from each other in the direction of elongation of the track, the spacing between said pairs of tools being such that adjacent ones of the tools of the adjacent pairs may be immersed in the ballast in the interspace between said adjacent ties; and a vertically adjustable tamping tool carrier supporting the two adjacent pairs of tamping tools for simultaneous raising and lowering of the two adjacent pairs of tamping tools.

4. The machine of claim 3, wherein one of said pairs of tools is spaced from the adjacent pair of tools in the direction of elongation of the ties.

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ARTHUR L. LA POINT, *Primary Examiner.*

R. A. BERTSCH, *Assistant Examiner.*