Feb. 11, 1969 J. K. STEWART 3,426,697

SWITCH TAMPERS

Filed Jan. 24, 1967

Sheet 1 of 2

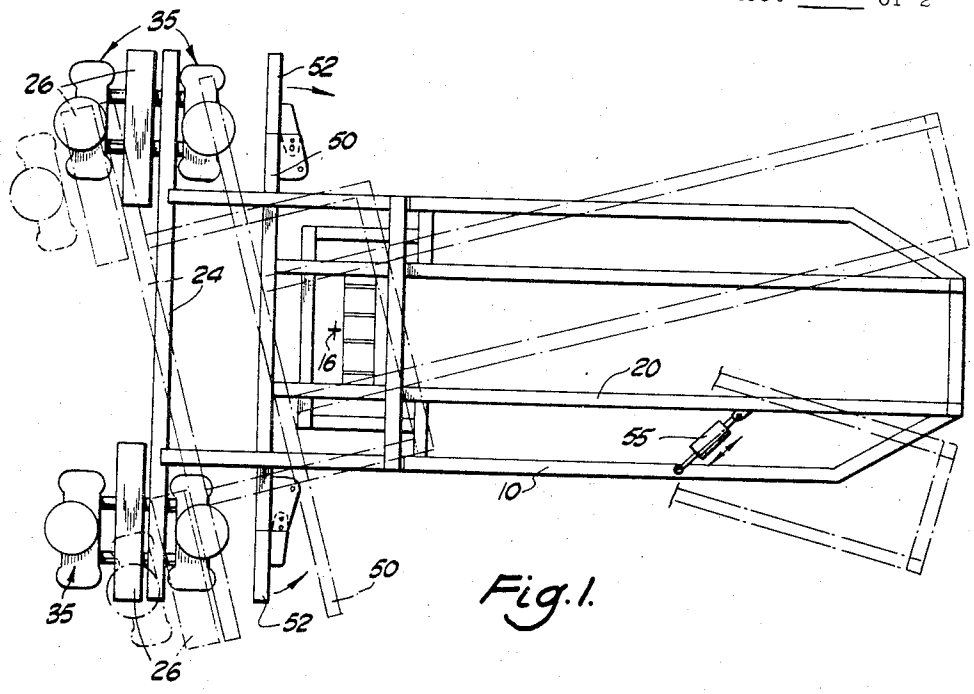

Fig. 1.

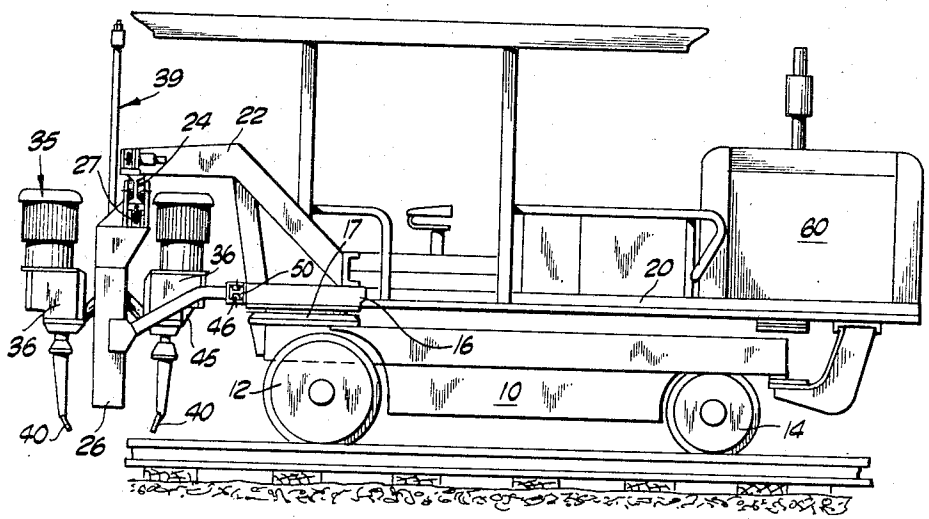

Fig. 2.

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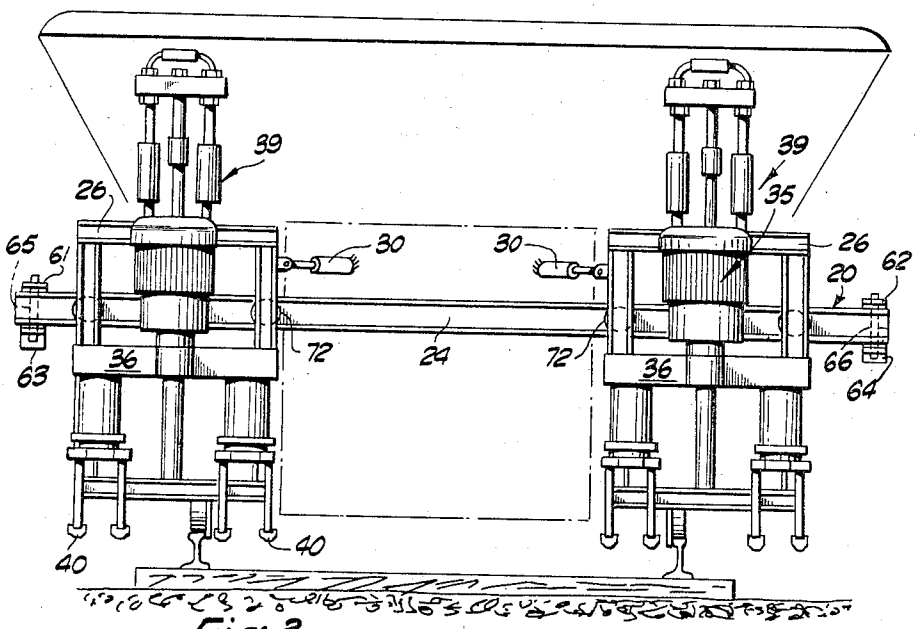

Fig. 3.

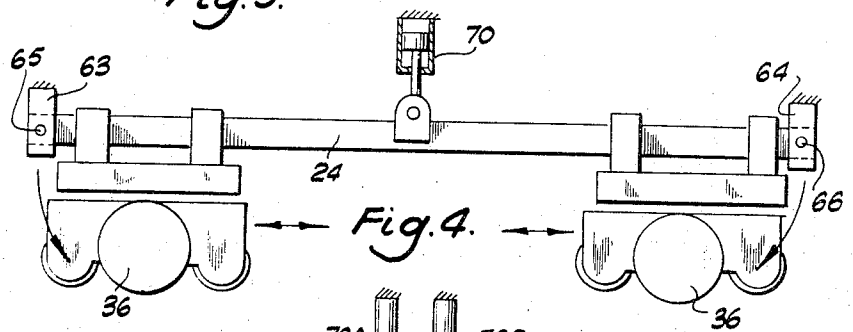

Fig. 4.

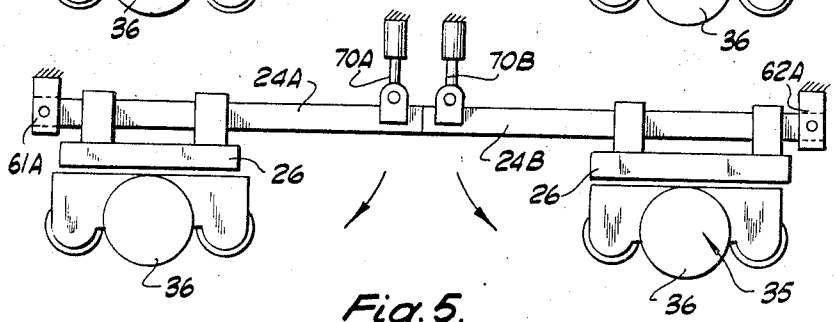

Fig. 5.

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SWITCH TAMPERS

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U.S. Cl. 104—12 5 Claims
Int. Cl. E01b 27/16

ABSTRACT OF THE DISCLOSURE

Apparatus for tamping the ballast beneath the rails of a railway track at switches, which apparatus has a pair of ballast penetrating tamping heads mounted on a transversely extending frame on the front of a track travelling vehicle, the heads being mounted so as to be independently movable to and fro across the frame and the frame being swingable in an arc about a vertical axis pivot mounting on the vehicle chassis, whereby to enable the heads to vary their spacing and position relative to the vehicle chassis, enter the spaces between the rails and tracks in the switches and follow the curve of the tracks in the switch.

Background of the invention

This invention relates to railroad ballast tamping machines and, particularly, to machines for tamping the ballast at or near railway track switches.

It has been known for many years to provide vehicles with tamping heads at fixed spacing and capable of penetrating the ballast in the vicinity of a tie to consolidate the ballast beneath the rails of the track. Such vehicles are intended for use on regular track and are unsuitable for work in the area of track switches because of their inability to cope with the spacing changes of the rails of the tracks in the switch and the change of contour of the track at the switch. A specialized tamping machine was produced for the purpose of tamping tracks in the area of switches. In this type of machine, a single tamping head was mounted on a metal beam which extended transversely of the track in front of the vehicle. Hydraulic means were provided for moving the tamping head along the beam transversely of the track so that the tamping head could occupy an infinite number of transverse positions relative to the vehicle, whereby to allow for the variation in rail spacing in the switch. Such a solution of the switch tamping problem has only been partially successful since, although the transverse movement of the tamping head relative to the vehicle has been, in the main, sufficient to accommodate for the variation in the spacing of the rails of the track at the switch, the prior proposals failed to take into account the changes in contour of the track, as well as the changes of spacing at and near the switches, and so were limited in their application.

In an attempt to overcome this disadvantage, the tamping tools of the head were mounted such that they could individually be moved out of the way to permit a single tool, or even a pair of opposed tools of the head, to be operable at one time. However, this did not result in an efficient tamping operation because the ballast in the vicinity of the tamping tool was able to flow away from the tool.

It is an object of the present invention to provide a switch tamping device capable of adjusting to variation of rail spacing and track contour so as to permit the insertion of many tamping tools into the ballast at the switch to perform a tamping operation in which the tools "support" each other and limit the flow of ballast away from the tamping area.

Another problem encountered in switch tamping operations and one which makes it impossible to employ conventional tamping machines, is that the ties in the switch are skewed with respect to the turn-out. Consequently, if a conventional tamper is used which has two heads, one over each rail, when one head comes down in the crib, the other head may well encounter a tie. It is a further object of the present invention to provide a device in which more than one tamping head may be employed and which, indeed, under certain circumstances, may permit two heads to work side by side in the switch "supporting" each other and restricting the flow of ballast.

Summary of the invention

According to the present invention, there is provided a railway track tamping device comprising a vehicle mounted on rail engaging wheels, at least one ballast tamping head mounted on the vehicle, means for moving the tamping head transversely of the track and means for pivoting the tamping head about an axis substantially vertical to the track.

Preferably, the tamping head is mounted on a swingable frame which is pivotally mounted on a substantially vertical axis on the vehicle chassis, means being provided for moving the tamping head transversely of the track on the frame and for swinging the frame in a substantially horizontal plane on the chassis.

In this fashion, the device according to the present invention can move the tamping head to an infinite number of positions relative to the chassis so that the tamping head may follow the curve of the track and be positioned so as to penetrate into the ballast in the small existing spaces between the rails in the switch.

According to a feature of the invention, the frame includes a transversely extending guide element overhanging the front end of the vehicle and two tamping heads mounted for vertical reciprocation, one on each of a pair of sub frames, both sub frames being mounted for transverse movement on the guide element.

Brief description of the drawings

The following is a description, by way of example, of certain embodiments of the invention, reference being had to the accompanying drawings in which:

FIGURE 1 is a diagrammatic plan view of a vehicle having one form of swingable frame with tamping heads mounted for transverse translation thereon;

FIGURE 2 is a diagrammatic side view of the device according to FIGURE 1;

FIGURE 3 is a diagrammatic front view of an alternative arrangement;

FIGURE 4 is a part plan view of the device of FIGURE 3; and

FIGURE 5 is a partial plan view of a second alternative arrangement.

Description of the preferred embodiments

In FIGURES 1 and 2, there is shown one manner of manner of putting the present invention into effect. The vehicle has a chassis **10** mounted on a front pair **12** and a rear pair **14** of rail engaging wheels. Pivotally mounted for swinging movement in a horizontal plane about a substantially vertical axis **16**, provided by a pivot head **17**, is a frame **20**. The frame **20** carries at its forward end an overhanging structure **22**. The structure **22** supports a transversely extending guide element **24** in the form of an I-section beam. Sub frames **26** are arranged on mountings **27** for transverse movement to and fro along the guide element **24**. Any suitable means, for example, hydraulic piston and cylinder arrangements **30** (see FIGURE 3), may be provided for moving the sub frames **26** either together or independently of each other on the guide element **24**.

On each of the two sub frames **26** is mounted a tamping head **35**. As shown in FIGURE 2, each tamping head **35** comprises a pair of tamping units **36** which are universally mounted on a sliding frame (not shown) on the sub frame **26**. The tamping heads **35** are mounted for up and down reciprocation into the ballast by means of a hydraulic piston and cylinder arrangement diagrammatically shown at **39**. The heads **35** are provided with squeeze cylinders (not shown) to urge each unit **36** of each head **35** towards and away from its other unit **36** beneath the tie when the tamping forks **40** are in the ballast so as to consolidate the ballast beneath a tie. Such a tamping head is described in detail in U.S. Patent No. 3,177,813, issued Apr. 13, 1965. It is to be understood that although this particular tamping head has been shown, any other suitable tamping head could be used.

In order to brace the frames **26**, bracing elements **45** are provided which at their inner ends, by means of rollers **46**, engage in transversely extending H-section member **50** which extends parallel to the element **24** across the vehicle. As seen in FIGURE 1, the member **50** may have hinged outer sections **52** which can be folded back to provide clearance for track travel of the vehicle.

In FIGURE 1, there is diagrammatically shown a hydraulic piston and cylinder arrangement **55** acting between the chassis **10** of the vehicle and the frame **20** and arranged to pivot the frame **20** together with its guide element **24** and tamping heads **35** in an arc relative to the chassis about the pivot axis **16**. As best seen in FIGURE 2, the driving motor **60** for the vehicle is mounted at the rear of the frame **20** and acts as a counterbalance weight for the tamping heads **35**.

In FIGURES 3 and 4 an alternative arrangement is shown, in which the frame member **20** comprises a transversely extending guide element, such as **24** of the foregoing described embodiment, provided with pivot mountings **61**, **62** on side members **63**, **64** of the chassis **10**. As illustrated, either a pivot pin **65** or a pivot pin **66** may be used at one time to provide alternative pivot joints for the frame **20**. The frame **20** with the sub frames **26** and tamping heads **35** thereon is swung about its pivot joint under the action of hydraulic piston and cylinder **70** acting against the chassis **10**. The element **24** will be pivoted in a clockwise or anti-clockwise direction, as seen in FIGURE 4, depending upon which pivot joint is active.

Again, as in the embodiment described in FIGURES 1 and 2, two tamping heads **35** are provided each comprising a pair of tamping units **36** mounted for up and down reciprocation and for fore and aft squeezing on sub frames **26**. The sub frames **26** may suitably, for example, by means of rollers **72**, be mounted for transverse movement on the guide element **24** under the action of cylinders **30**. The frames **26** and the tamping heads **35**, may be operated independnetly or together. Suitable counterbalancing and bracing (not shown) may be provided to permit the element **24** to be swung in an arc outwardly of the vehicle chassis **10**.

In the further alternative embodiment diagrammatically illustrated in FIGURE 5, the guide element **24** is centrally split to provide two half frames **24A** and **24B** each carrying a sub frame **26** on which a tamping head **35** is mounted for sliding movement transversely of the chassis **10**. In this arrangement, pivotal mountings **61A** and **62A** are permanently engaged and two hydraulic piston and cylinder arrangements **70A** and **70B** are provided, one for each of the half frames. As with the device as illustrated in FIGURES 3 and 4, suitable bracing and counterbalancing arrangements will be provided to permit of the outward swinging, as indicated by the arrows in FIGURE 5, of both of the half frames **24A**, **24B** away from the chassis **10**.

It will be observed that the invention, by providing for the pivoting of the tamping heads about a substantially vertical axis, in addition to providing for the transverse movement of the heads, produces a device capable of accounting for the skewing of ties in the switch and the general configuration of the track. A whole tamping head can be lowered at one time into the ballast so that all of the tamping tools support each other to consolidate the ballast, and furthermore, in many track configurations, both heads can be used side by side to provide even greater consolidation.

What I claim as my invention is:

1. A railway track tamping device comprising a vehicle having a chassis mounted on rail engaging wheels; a frame, comprising two half frame members on the chassis, one half frame member being pivoted about a substantially vertical axis on one side of the vehicle, and the other half frame member being pivoted about a substantially vertical axis on the other side of the vehicle; a tamping head mounted on each half frame member and means for moving each tamping head transversely of the track on its half frame member; a frame pivoting means for each half frame member acting to swing the half frame members outwardly of the vehicle about their pivot points.

2. A railway track tamping device comprising a vehicle having a chassis mounted on rail engaging wheels; a swingable frame pivotally mounted on a substantially vertical axis on the chassis; means for swinging said frame in a substantially horizontal plane on said chassis; said frame including a transversely extending guide element over-hanging the front end of the vehicle; a pair of subframes mounted on the guide element for transverse independent movement relative to each other; a tamping head mounted for vertical reciprocation on each of said subframes; said frame having a rearwardly extending portion and counterbalance means on said portion.

3. A device as claimed in claim **2** in which the frame is pivoted to the chassis centrally of the vehicle.

4. A device as claimed in claim **2** in which the frame is pivoted at one side of the vehicle.

5. A device as claimed in claim **2** in which the vehicle has a front and a rear set of rail engaging wheels supporting the chassis and in which the pivoting axis is arranged centrally of the chassis, adjacent the front set of wheels.

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