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(72) Inventeurs/Inventors:
THEURER, JOSEF, AT;
PEITL, FRIEDRICH, AT

(73) Propriétaire/Owner:
FRANZ PLASSER BAHNBAUMASCHINEN-INDUSTRIEGESELLSCHAFT M.B.H., AT

(74) Agent: RICHES, MCKENZIE & HERBERT LLP

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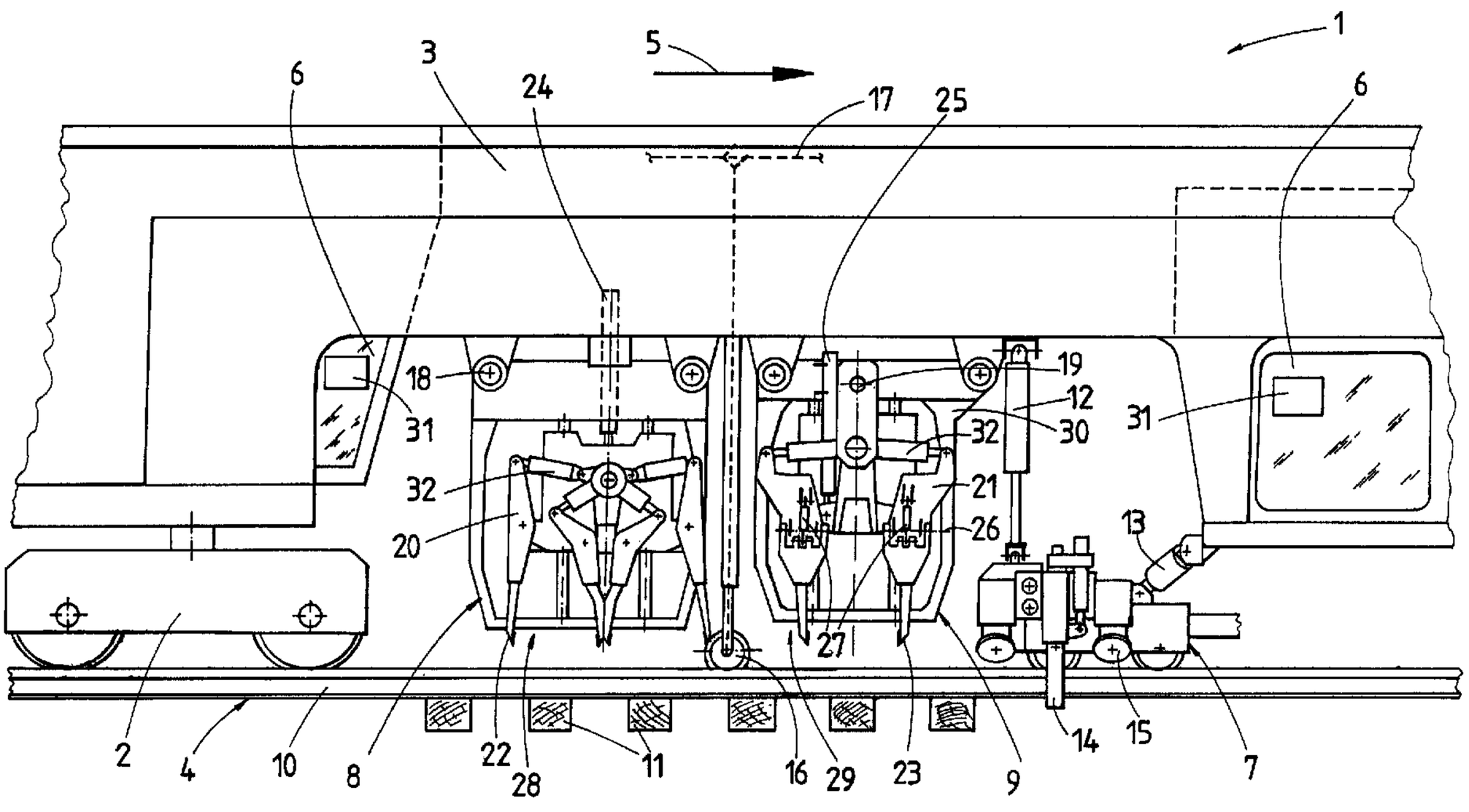

(57) Abrégé/Abstract:
A track tamping machine (1) comprises a machine frame (3), a track lifting and lining unit (7), a reference system (17) for track position correction, and two tamping units (8,9) arranged one immediately following the other in the longitudinal direction of the machine. The tamping units are independently vertically adjustable and have tamping tools (20,21) with tamping tines (22,23), squeezable towards one another by means of squeeze drives (32), for immersion into ballast on both sides of rails (10) of a track (4). The tamping tines (23) of only one of the tamping units (9), for forming a switch tamping unit (29), are respectively mounted for transverse pivoting about an axis (26) extending approximately in the longitudinal direction of the machine and are connected to a pivot drive (27). Two operator's cabs (6) are distanced from one another in the longitudinal direction of the machine, each comprising a control device (31) for controlling one of the tamping units (8 or 9) arranged between the cabs (6).

ABSTRACT

A track tamping machine (1) comprises a machine frame (3), a track lifting and lining unit (7), a reference system (17) for track position correction, and two tamping units (8,9) arranged one immediately following the other in the longitudinal direction of the machine. The tamping units are independently vertically adjustable and have tamping tools (20,21) with tamping tines (22,23), squeezable towards one another by means of squeeze drives (32), for immersion into ballast on both sides of rails (10) of a track (4). The tamping tines (23) of only one of the tamping units (9), for forming a switch tamping unit (29), are respectively mounted for transverse pivoting about an axis (26) extending approximately in the longitudinal direction of the machine and are connected to a pivot drive (27). Two operator's cabs (6) are distanced from one another in the longitudinal direction of the machine, each comprising a control device (31) for controlling one of the tamping units (8 or 9) arranged between the cabs (6).

A TRACK TAMPING MACHINE

The invention relates to a track tamping machine for tamping a track composed of rails and sleepers, comprising a machine frame supported on on-track undercarriages, a track lifting and lining unit and a reference system for correcting the track position as well as two tamping units arranged one immediately following the other in the longitudinal direction of the machine and having respective tamping tools with tamping tines for immersion into ballast on both sides of the rails on which the on-track undercarriages are travelling, wherein the tamping tools are vertically adjustable independently of one another and wherein the tamping tools are squeezable towards one another by means of squeeze drives.

A machine of this kind is already known from US 4 942 821 and is equipped with a track lifting and lining unit as well as with a total of four tamping units of similar design. The latter are arranged one immediately following the other in the longitudinal direction of the machine in respective pairs above each of the two rails of the track travelled upon and are connected to the machine frame for individual vertical adjustment. During so-called plain line tamping which is carried out in track sections free of switches, all four tamping units are lowered and their tamping tools squeezed towards one another while pivoting about axes extending in the transverse direction of the machine. If the machine is employed in switch sections, only one tamping unit per rail respectively is lowered into the ballast while the second tamping unit remains in the raised inoperative position. Additionally, there is also the possibility of pivoting each individual tamping tool of the lowered tamping units about said pivot axis by means of the squeeze drive into a horizontal idle position if, for instance in a switch or crossing, a track obstacle is in the way of deploying the tamping tool in question. In this case, a single

tamping tool is used without counterpressure. However, optimum treatment of switch sections is not possible with a machine of this kind.

Multi-sleeper tamping machines for operation in plain line track are further disclosed, for instance, in AT 351 070 or DE-A-2 005 187. With these machines, operation in switch sections is not possible.

On the other hand, machines are also known which are especially equipped for tamping switches with two tamping units arranged one following the other in the longitudinal direction of the machine. One such machine, described in US 4 825 768 or also in US 4 905 604, shows a vertically displaceable switch tamping unit having squeezable and laterally pivotable tamping tools. Additionally, immediately following in the longitudinal direction of the machine, a so-called auxiliary tamping unit is connected to the frame of the tamping unit, the auxiliary tamping unit being extensible in the transverse direction of the machine by means of a horizontal telescopic guide as far as to the outer rail of the branch track. The auxiliary tamping unit is composed of merely a single pair of squeezable tamping tools which are lowered into the ballast only on one side of said switch rail lifted by means of a supplementary lifting unit in accordance with the reference system of the machine. If the other side of the rail is to be tamped as well, the auxiliary tamping unit must first be retracted from the ballast and displaced further outward in the transverse direction of the track.

Finally, according to US 5 379 700 it is also known to couple a tamping machine equipped with a supplementary lifting device for lifting switch sections to a second, so-called auxiliary tamping machine, the machines travelling separately during operation. The first tamping machine is used in plain

line track and for lifting and rapidly fixing switch sections in the desired position, while by means of the immediately following auxiliary tamping machine treatment of the switch can be finished without time pressure, the switch being for the most part already tamped.

The object of the invention now lies in providing a track tamping machine of the kind specified in the introduction by means of which optimum tamping can be obtained both in switch and in plain line sections of a track.

This object is achieved with a machine of the kind specified at the beginning in that the tamping tines of only one of the two tamping units, for forming a switch tamping unit, are respectively mounted for transverse pivoting about an axis extending approximately in the longitudinal direction of the machine and are connected to a pivot drive, and that two operator's cabs are provided which are distanced from one another in the longitudinal direction of the machine, each cab comprising a control device for controlling one of the tamping units arranged between the operator's cabs.

With this development, for the first time both a switch tamping unit designed especially for the treatment of switches as well as an efficiently performing plain line tamping unit for tamping track sections free of switches are arranged on a single machine. This provides the special advantage that particularly those track sections having only short plain line sections free of switches can be tamped without time-consuming retooling by using the best-suited tamping unit in each case. The resulting possibility of tamping the entire track section, containing plain line track and switch areas, in the course of a single, joint operational pass enables a more uniform correction of track position to be obtained with a more durable compaction of the ballast supports.

Additional advantages according to the invention will become apparent from the description.

The invention is described in more detail below with reference to the embodiment represented in the drawing, in which

Fig. 1 shows a side view of a track tamping machine designed according to the invention, and

Fig. 2 and 3 each show a schematised enlarged view in the longitudinal direction of the machine of the tamping units of the machine arranged one following the other in the longitudinal direction of the machine.

A track tamping machine 1 shown in Fig. 1 has a machine frame 3, supported on on-track undercarriages 2, which is mobile on a track 4 in an operating direction indicated by an arrow 5. Arranged on the machine frame 3 in the region between two operator´s cabs 6 provided thereon are a track lifting and lining unit 7 and two tamping units 8,9 for tamping the track 4 composed of rails 10 and sleepers 11. The track lifting and lining unit 7 is articulatedly connected to the machine frame 3 by means of vertical adjustment drives 12 and lining drives 13 and is equipped with lifting hooks 14 and roller lifting clamps 15 for application to the rails 10. A measuring axle 16, likewise designed to roll on the rails 10 of the track 4, for tracing the track position is associated with a machine-specific reference system 17 and is vertically adjustably connected to the machine frame 3 in the area between the two tamping units 8,9 arranged one immediately following the other in the longitudinal direction of the machine.

As can be better seen now also in Fig. 2 and 3, the tamping units 8,9 are each mounted on the machine frame 3 for transverse adjustment by means of horizontal guide columns 18 and are connected to a respective transverse displacement drive 19 for individual displacement. Each tamping unit 8 or 9 has

tamping tools 20 or 21 which are designed to be squeezable towards one another by means of squeeze drives 32 and are provided with tamping tines 22 or 23. The tamping units 8,9 can be lowered independently of one another by means of vertical adjustment drives 24 or 25 and thereby the tamping tines 22,23 can be immersed into the ballast on both sides of the rails 10 of the track 4 on which the on-track undercarriages 2 are travelling. A total of two pairs of tamping units 8,9, distanced from one another in the transverse direction of the machine, are provided for the simultaneous tamping of both rail areas.

For forming switch tamping units 29, the tamping tines 23 of the two tamping units 9 are each mounted for transverse pivoting about an axis 26 extending approximately in the longitudinal direction of the machine and are connected to a pivot drive 27. Viewed in the transverse direction of the track, each switch tamping unit 29 is composed of a total of two autonomous tamping devices 30 designed for vertical adjustment independently of one another by means of the vertical adjustment drives 25 and for transverse adjustment by means of the transverse displacement drives 19, the tamping devices being arranged in pairs respectively with regard to a rail 10 of the track 4. The other tamping units 8, designed as plain line tamping units 28 for operation in plain line sections free of switches, are arranged following the switch tamping units 29 with regard to the operating direction (arrow 5) and, per longitudinal side of the rail, comprise four tamping tools 20 with tamping tines 22, positioned one following the other in the longitudinal direction of the machine. With this it is possible to simultaneously tamp two immediately adjacent sleepers 11 of the track 4.

In operation for tamping tracks 4 under variable conditions, the tamping unit which is purposefully employed is the one which is respectively better suited to the prevailing

circumstances. In doing so, the tamping units 8,9 are individually controlled by an operator, situated either in the front or rear operator´s cab 6, by means of control devices 31 according to the conditions or the course of the rails. In plain line sections free of switches, preferably the highly efficient plain line tamping units 28 will be employed, being unrestrictedly adaptable even in track curves due to their transverse adjustability. In switch and crossing sections, however, the plain line tamping units 28 remain idle and only the switch tamping units 29 are lowered, being best able to be adapted to the respective irregular course of the rails by virtue of being composed of four tamping devices 30 and having transversely pivotable tamping tines 23. At the same time, the switch tamping units 29 may, on occasion, also be employed in plain line sections if particular, infrequently occurring track obstacles make it impossible in places to lower the plain line tamping units 28 with all their tamping tines 22. In this case, changing between the tamping units 8,9 proceeds without problems and, above all, without the necessity of retooling work.

Claims:

1. A track tamping machine (1) for tamping a track (4) composed of rails (10) and sleepers (11), comprising a machine frame (3) supported on on-track undercarriages (2), a track lifting and lining unit (7) and a reference system (17) for correcting the track position as well as two tamping units (8,9) arranged one immediately following the other in the longitudinal direction of the machine and having respective tamping tools (20,21) with tamping tines (22,23) for immersion into ballast on both sides of the rails (10) on which the on-track undercarriages (2) are travelling, wherein the tamping tools (20,21) are vertically adjustable independently of one another and wherein the tamping tools (20,21) are squeezable towards one another by means of squeeze drives (32), characterized in that the tamping tines (23) of only one of the two tamping units (9), for forming a first switch tamping unit (29), are respectively mounted for transverse pivoting about an axis (26) extending approximately in the longitudinal direction of the machine and are connected to a pivot drive (27), and that two operator's cabs (6) are provided which are distanced from one another in the longitudinal direction of the machine, each cab (6) comprising a control device (31) for controlling one of the tamping units (8, 9) arranged between the operator's cabs (6).

2. A machine according to claim 1, characterized in that the first switch tamping unit (29) having the transversely pivotable tamping tines (23) is arranged preceding, in the working direction, the second tamping unit (8) designed as a plain line tamping unit (28) for operation in plain line sections free of switches, and the first switch tamping unit (29) only comprises two tamping tools (21) arranged one following the other in the longitudinal direction of the machine.

3. A machine according to claim 2, characterized in that the plain line tamping unit (28) comprises four tamping tools (20), arranged one following the other in the longitudinal direction of the machine and each being connected to an individual squeeze drive (32), for simultaneously tamping two immediately adjacent sleepers (11).

4. A machine according to any one of claims 1, 2 or 3, characterized in that a measuring axle (16), associated with the reference system (17) and designed to roll on the rails (10) of the track (4), is provided between the two tamping units (8,9) for tracing the position of the track.

5. A machine according to any one of claims 1 to 4, characterized in that both tamping units (8,9) are mounted for transverse adjustment on the machine frame (3) and are connected to a transverse displacement drive (19).

6. A machine according to any one of claims 1 to 5, characterized in that a second switch tamping unit, distanced from the first switch tamping unit in the transverse direction of the machine, is provided, wherein the first and second switch tamping units are composed of a total of four autonomous tamping devices (30) vertically and transversely adjustable independently of one another, the tamping devices (30) being arranged in pairs respectively with regard to the rail (10) of the track (4).

7. A machine for tamping ballast underneath a track comprised of two rails fastened to ties spaced to define cribs therebetween, each rail having a gage side and a field side, the machine comprising

(a) a machine frame extending in a longitudinal direction and supported on the track by undercarriages for moving in an operating direction,

(b) a track lifting and lining unit mounted on the machine frame and operable to correct the track position,

(c) a reference system controlling lifting and lining of the track by the track lifting and lining unit, and

(d) two adjoining tamping heads arranged sequentially on the machine frame in the longitudinal direction at a respective one of the rails, each tamping head comprising

(1) ballast tamping tools reciprocable towards each other in the longitudinal direction at the gage side and the field side of the rail,

(2) drives for reciprocating the ballast tamping tools,

(3) drives for vertically adjusting the ballast tamping tools of each tamping head independently of the vertical adjustment of the ballast tamping tools of the other tamping head for immersing tamping picks on the ballast tamping tools in the ballast underneath the track,

(4) the tamping picks on the ballast tamping tools of only one of the tamping heads being pivotal in a plane extending transversely to the longitudinal direction about an axis extending at least approximately in the longitudinal direction to adapt the one tamping head for operation in switches,

(5) pivoting drives for pivoting the tamping picks on the ballast tamping tools of the one tamping head, and

(6) two operator's cabs mounted on the machine frame and spaced from each other in the longitudinal direction, the two tamping heads being arranged between the cabs, and each cab housing a control panel for operating a respective one of the tamping heads.

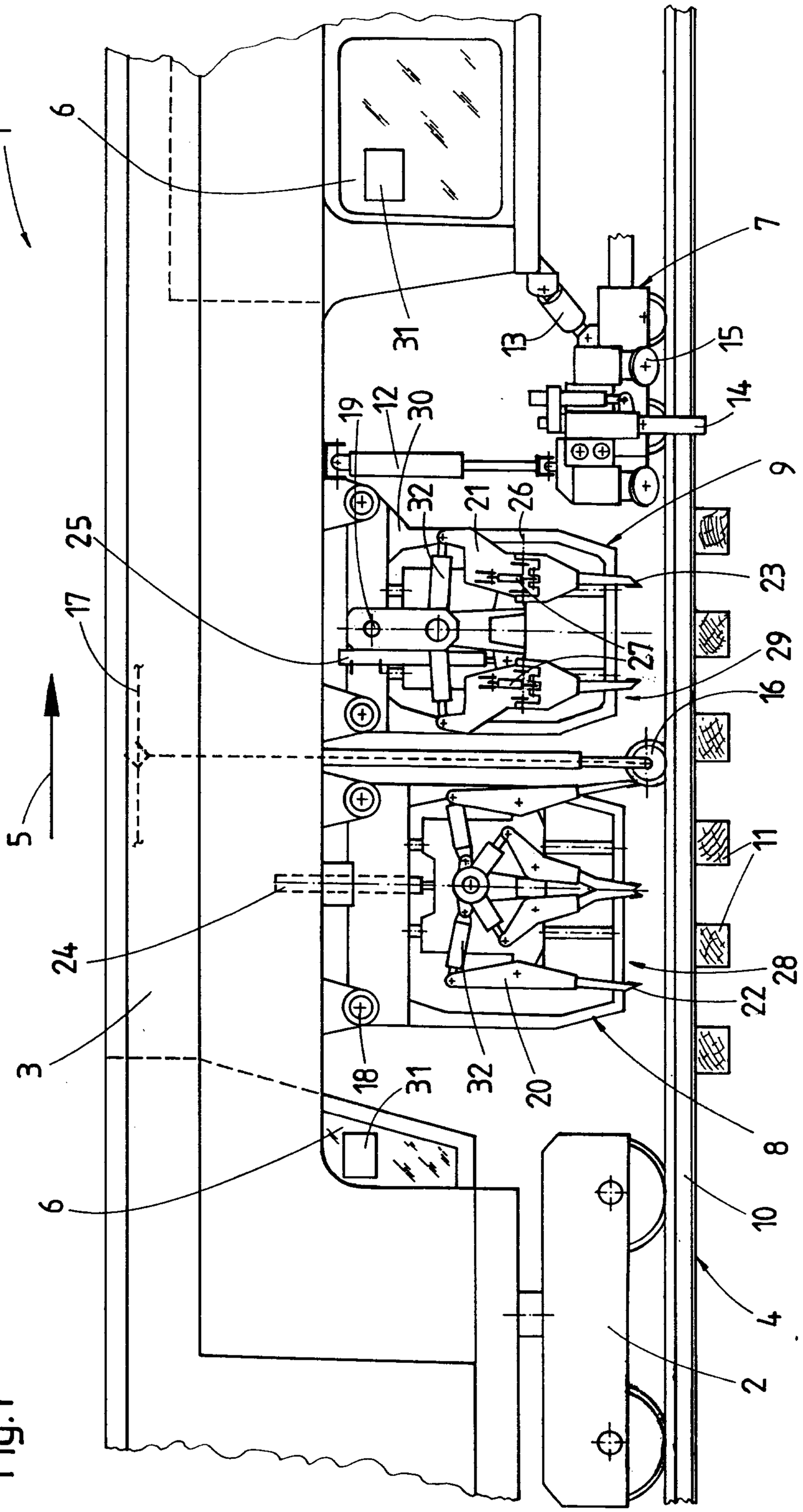
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Fig.1

Fig. 2

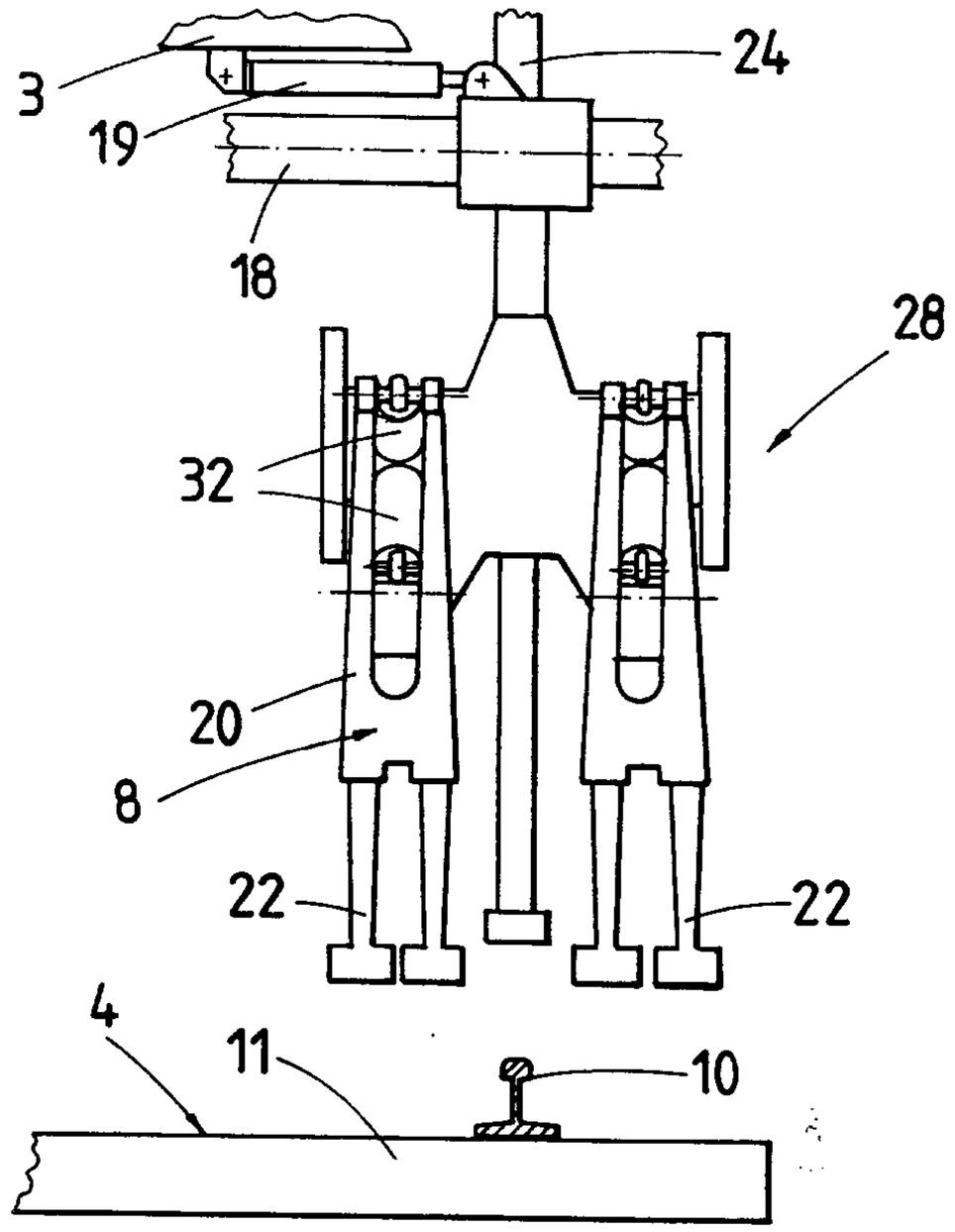
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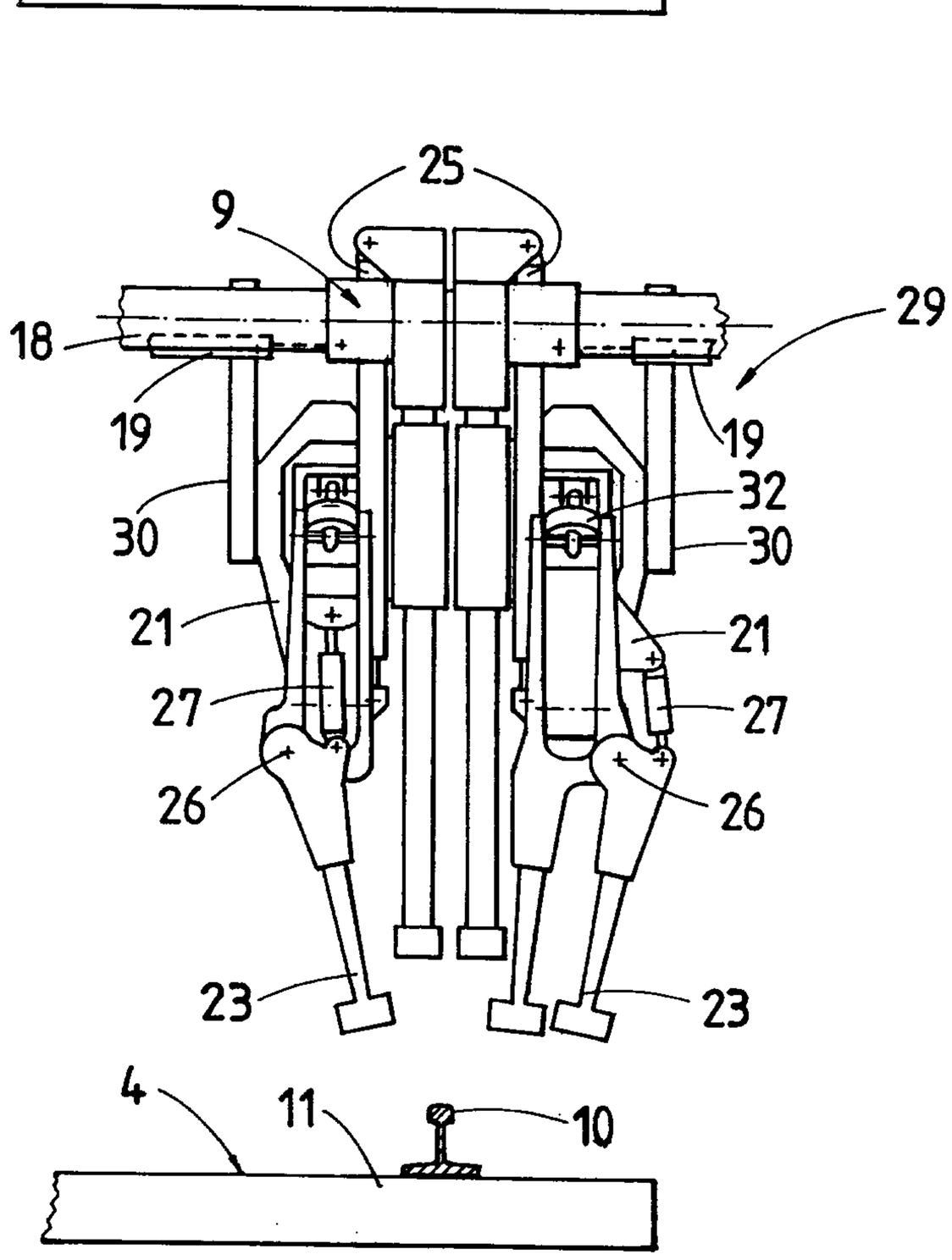
Fig.3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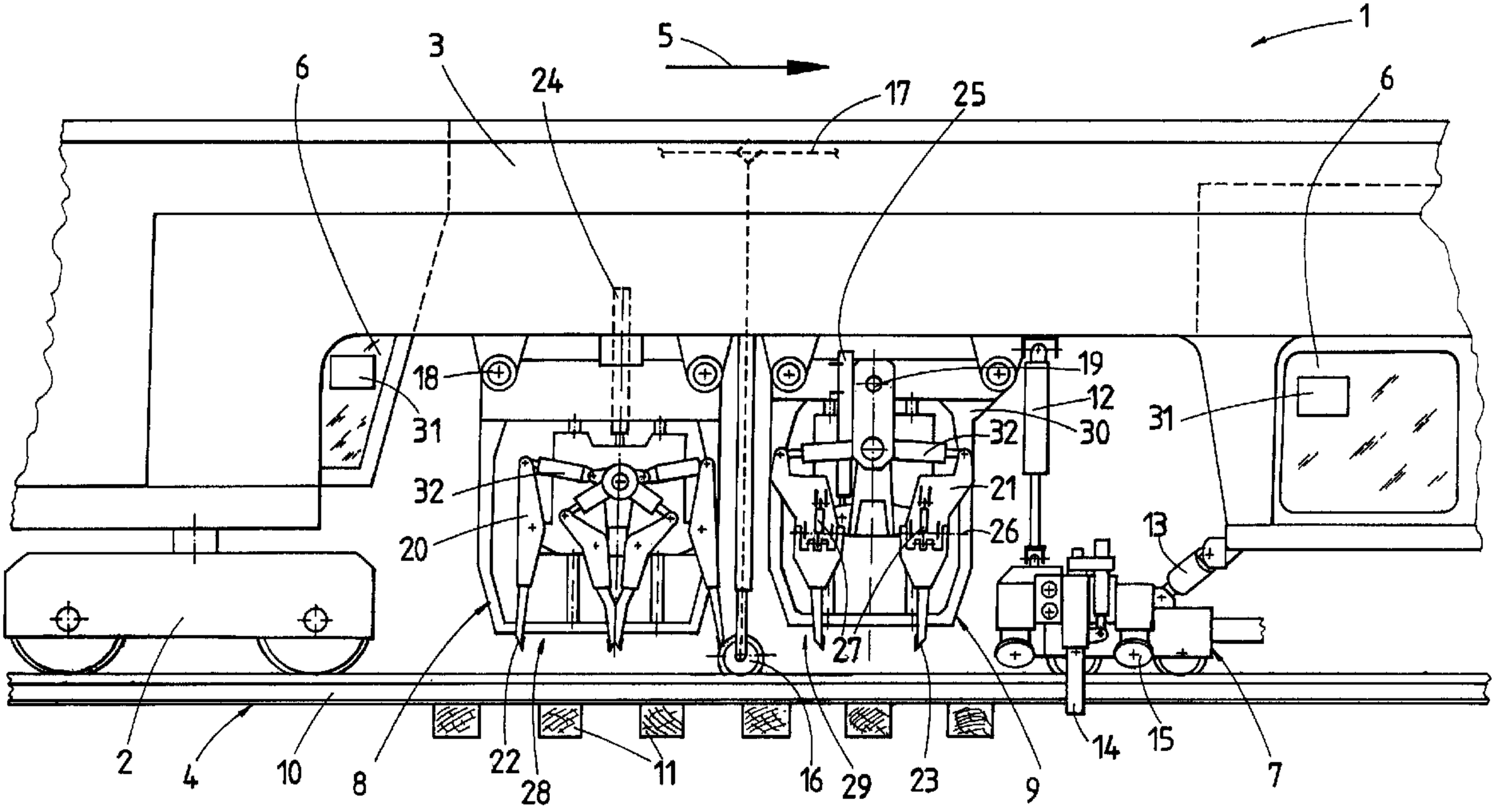
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