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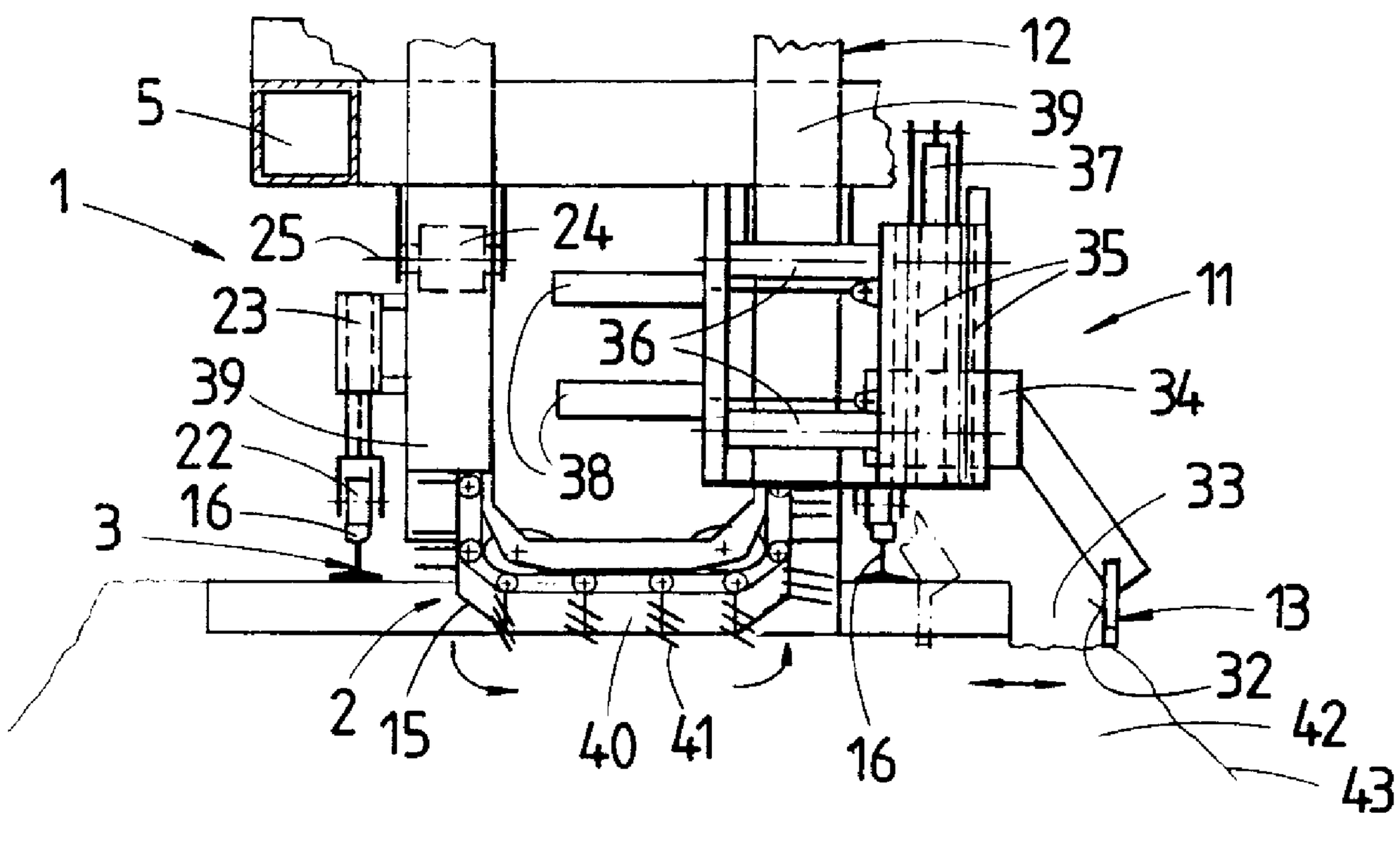
(54) Titre : MACHINE MUNIE D'UN EXCAVATEUR DE CASES A TRAVERSES
(54) Title: A MACHINE HAVING A SLEEPER CRIB EXCAVATOR



(57) Abrégé/Abstract:
A machine (1) consists of a machine frame (5), supported on on-track undercarriages, on which a sleeper crib excavator (11) is arranged. The latter serves for removing ballast situated in a sleeper crib (2) of a track (3). The sleeper crib excavator (11) is formed as an endless clearing chain (12) designed to be set in rotation by means of a drive. In order to lower a ballast take-up segment (15) located in the lowermost end region into the sleeper crib (2) situated between rails (16) of the track (3), the clearing chain (12) is mounted for vertical adjustment on the machine frame (5) and connected to a displacement drive.

ABSTRACT

A machine (1) consists of a machine frame (5), supported on on-track undercarriages, on which a sleeper crib excavator (11) is arranged. The latter serves for removing ballast situated in a sleeper crib (2) of a track (3). The sleeper crib excavator (11) is formed as an endless clearing chain (12) designed to be set in rotation by means of a drive. In order to lower a ballast take-up segment (15) located in the lowermost end region into the sleeper crib (2) situated between rails (16) of the track (3), the clearing chain (12) is mounted for vertical adjustment on the machine frame (5) and connected to a displacement drive.

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A MACHINE HAVING A SLEEPER CRIB EXCAVATOR

The invention relates to a machine having a machine frame supported on on-track undercarriages as well as a sleeper crib excavator for removing ballast situated in a sleeper crib of a track.

A machine of this kind for exchanging damaged sleepers is already known from US 5 125 345, wherein ballast situated in a sleeper crib adjoining a sleeper to be exchanged is removed with the aid of a sleeper crib excavator. The sleeper crib excavator is composed of four plate-shaped clearing elements which extend in the longitudinal direction of the machine and are arranged at a distance from one another in the transverse direction of the machine. Said clearing elements are transversely displaceable in the direction towards the ballast bed shoulders in respective pairs independently of one another by means of separate drives. Owing to said transverse movement, the ballast present in the sleeper crib can be shifted towards the respective ballast bed shoulder.

According to FR 2 588 023 A1 and DE 1 116 257, machines are known which have a clearing member, designed as an endless chain, for taking up ballast. Said clearing member, designed in the way of a bucket chain, is lowered between the rails of the track in order to thereby transport the entire bedding ballast upwards onto a conveyor belt. Removal of the sleepers is required before lowering the clearing member. In the context of sleeper renewal, it is additionally known according to US 4,611,541 to arrange an endless clearing chain between two sleeper changing devices spaced from one another in the longitudinal direction of the machine, in order to thereby feed the entire ballast of the ballast bed to a screening plant for cleaning.

Finally, a further machine for cleaning the ballast bed is known from US 5 513 452. A first clearing member located in the front end region of the machine in the operating direction serves for taking up new ballast deposited on the track. Said ballast is transported to behind a second clearing device via a conveyor belt arrangement and is discharged there upon the exposed formation in order to supplement the ballast cleaned by means of a screening plant.

It is the object of the present invention to provide a machine as specified, by means of which it is possible to accomplish an improved sleeper crib excavation for facilitating a sleeper renewal.

This object ist achieved with a machine of the specified kind in that the sleeper crib excavator is formed as an endless clearing chain, designed to be set in rotation by means of a drive, which, in order to lower a ballast take-up segment located in the lowermost end region into the sleeper crib situated between rails of the track, is mounted for vertical adjustment on the machine frame and connected to a displacement drive.

By using a clearing chain of this kind, it is possible to remove substantially the entire ballast situated in the sleeper crib between the rails. Additionally, it is also of particular advantage that the ballast engaged by the sleeper crib excavator can be removed completely from the track with the aid of the endless chain and can be stored intermediately. Thus, the following insertion of a new sleeper can be accomplished unhindered and quickly, making avoidable in particular a ballast jam which would render difficult the insertion of the sleeper under the second rail in the direction of insertion.

Further advantages become apparent from the drawing.

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

Fig. 1 shows a side view of a machine according to the invention with a sleeper crib excavator having a clearing chain, and

Fig. 2 shows an enlarged partial view of the sleeper crib excavator according to arrow II in Fig. 1.

A machine 1, shown in Fig. 1, for clearing a sleeper crib 2 of a track 3 is essentially composed of a machine frame 5 supported on on-track undercarriages 4. Arranged at a front end - with respect to an operating direction (arrow 6) - of the machine frame 5 is a driver´s and operator´s cab 7

with a central control device 8. An energy unit 10 is provided for supplying energy to a motive drive 9 as well as to all drives yet to be described. Arranged between the two on-track undercarriages 4 is a sleeper crib excavator 11 consisting of a clearing chain 12 and a clearing shield 13. The clearing chain 12 is designed endless and able to be set in rotation by means of a drive 14. The lowermost end region of the clearing chain 12, facing the track 3, is designed as a ballast take-up segment 15 for being lowered into the sleeper crib 2 situated between rails 16 of the track 3. To that end, the clearing chain 12 is mounted on a telescopically elongatable supporting arm 17 which is fastened to the machine frame 5 and has a displacement drive 18. The clearing chain 12 is designed for rotation and vertical adjustment in a plane of rotation 21 extending perpendicularly to the longitudinal direction of the machine and at an angle α to a base plane 20 formed by wheel contact points 19 of the on-track undercarriages 4. The angle α is preferably about 40-50^{o}. Arranged on the clearing chain 12 are flanged rollers 22, spaced from one another in the transverse direction of the track and respectively associated with a rail 16, which support the clearing chain 12 on the track 3. The flanged rollers 22 are respectively connected to a vertical adjustment drive 23. For better support and guidance of the clearing chain 12, two rollers 24 are arranged on the machine frame 5, spaced from one another in the transverse direction of the machine. Said rollers 24 are mounted for rotation about a horizontal axis 25 extending in the transverse direction of the machine. Located at the end of the clearing chain 12 opposite the ballast take-up segment 15 is a discharge point 26 for the taken-up ballast. Said discharge point 26 is arranged immediately above a charging opening 27 of a ballast store 28 located on the machine frame 5. The floor of said ballast store 28 is in the shape of a conveyor belt 29, extending in the longitudinal direction of the machine, which has a discharge end 30 situated above discharge chutes 31 arranged on the machine frame 5.

Shown in more detail in Fig. 2 is the sleeper crib excavator 11 with the clearing shield 13 for clearing the ballast, arranged in a vertical plane 32 extending in the longitudinal direction of the machine, which is positioned in a sleeper end region 33. The clearing shield 13 is attached to a tool carrier 34 which, for its part, is connected to vertical and transverse guides 35,36. With the aid of vertical and transverse adjustment drives 37,38, the clearing shield 13 is adjustable along the guides 35,36 both vertically and in the

transverse direction of the track. The structure of the endless clearing chain 12 - sufficiently known from track bed cleaning machines - can be better observed in the area of the ballast take-up segment 15. The clearing chain 12, circulating outside the ballast take-up segment 15 in trough-shaped guides 39, consists of a multitude of articulatedly connected chain links 40 which are provided with so-called scraper fingers 41. These serve to rip the ballast out of the sleeper crib 2 and to convey the ballast onward in the guide 39.

The mode of operation of the machine 1 will be described below. To begin with, said machine is driven to the work site, i.e. up to the sleeper crib 2 to be cleared. (The old sleeper, not shown, has already been removed beforehand independently of the machine 1). In order to clear away the ballast in the sleeper end region 33, first the clearing shield 13 is lowered by actuation of the vertical adjustment drive 37. Said clearing shield 13 plunges into a ballast bed 42 of the track 3 immediately next to the rail 16 (see position of clearing shield shown in dash-dotted lines in Fig. 2). Actuation of the transverse adjustment drive 38 causes the clearing shield 13 to push the ballast in the sleeper end region 33 beyond a bedding shoulder 43 of the ballast bed 42. For the purpose of clearing the sleeper crib 2 situated between the rails 16, the clearing chain 12 is displaced from a transit position (represented dash-dotted in Fig. 1) into an operating position (full lines in Fig. 1) by actuation of the displacement drive 18. During this, the drive 14 is already activated, so that the ballast take-up segment 15, with the clearing chain 12 running (circulating direction according to the small arrows in Fig. 2), is able to dive without problems into the sleeper crib 2 filled with ballast. With the aid of the vertical adjustment drives 23, the clearing chain 12 can be set to the required immersion depth and supported on the track 3 via the flanged rollers 22. The ballast ripped from the sleeper crib 2 by means of the scraper fingers 41 is transported by the clearing chain 12 through the guide 39 and ejected from the discharge point 26 into the ballast store 28. By actuation of the conveyor belt 29, the ballast can be reintroduced into the track 3 at any desired place via the discharge chutes 31. In order to clear the sleeper crib 2 exactly, the machine 1 is moved slightly - i.e. to just in front of a next sleeper 44 adjoining the cleared sleeper crib 2 - in the operating direction (arrow 6). With the clearing chain 12 lifted into the transfer position, the machine 1 can be driven to the next sleeper crib to be cleared. The sleeper crib excavator 11

is controlled by means of the control device 8 arranged in the driver´s and operator´s cab 7. The subsequent installing of a new sleeper into the cleared sleeper crib 2 is carried out independently of the machine 1 at a later point in time, the insertion being expediently effected from the side of the cleared sleeper end region.

As an alternative to the embodiment described here, it would also be conceivable to arrange on the machine 1 devices for removal and installation or for transport and storage of old and new sleepers.

In order to increase the flexibility of the sleeper crib excavator, it would also be possible to arrange an additional clearing shield - opposite the first clearing shield in the transverse direction of the machine - on the machine frame.

Claims

1. A machine (1) having a machine frame (5) supported on on-track undercarriages (4) as well as a sleeper crib excavator (11) for removing ballast situated in a sleeper crib (2) of a track (3), characterized in that the sleeper crib excavator (11) is formed as an endless clearing chain (12), designed to be set in rotation by means of a drive (14), which, in order to lower a ballast take-up segment (15) located in the lowermost end region into the sleeper crib (2) situated between rails (16) of the track (3), is mounted for vertical adjustment on the machine frame (5) and connected to a displacement drive (18).

2. A machine according to claim 1, characterized in that the clearing chain (12) is designed for rotation and vertical adjustment in a plane of rotation (21) extending perpendicularly to the longitudinal direction of the machine and at an angle (α) to a base plane (20) formed by wheel contact points (19) of the on-track undercarriages (4).

3. A machine according to claim 1 or 2, characterized in that the clearing chain (12) is connected to flanged rollers (22) for placement upon the rails (16) of the track (3).

4. A machine according to claim 3, characterized in that the flanged rollers (22) are designed for adjustment in the plane of rotation (21) as well as in the direction of displacement of the clearing chain (12).

5. A machine according to any one of claims 1 to 4, characterized in that the sleeper crib excavator (11) is composed of the clearing chain (12), intended to be lowered between the rails (16) of the track (3), and a clearing shield (13) positioned in a vertical plane (32) extending in the longitudinal direction of the machine and intended to be lowered in the sleeper end region (33) located between the rail (16) and a bedding shoulder (43) of a ballast bed (42), the clearing shield (13) being connected to drives (37,38) for independent vertical and transverse displacement.

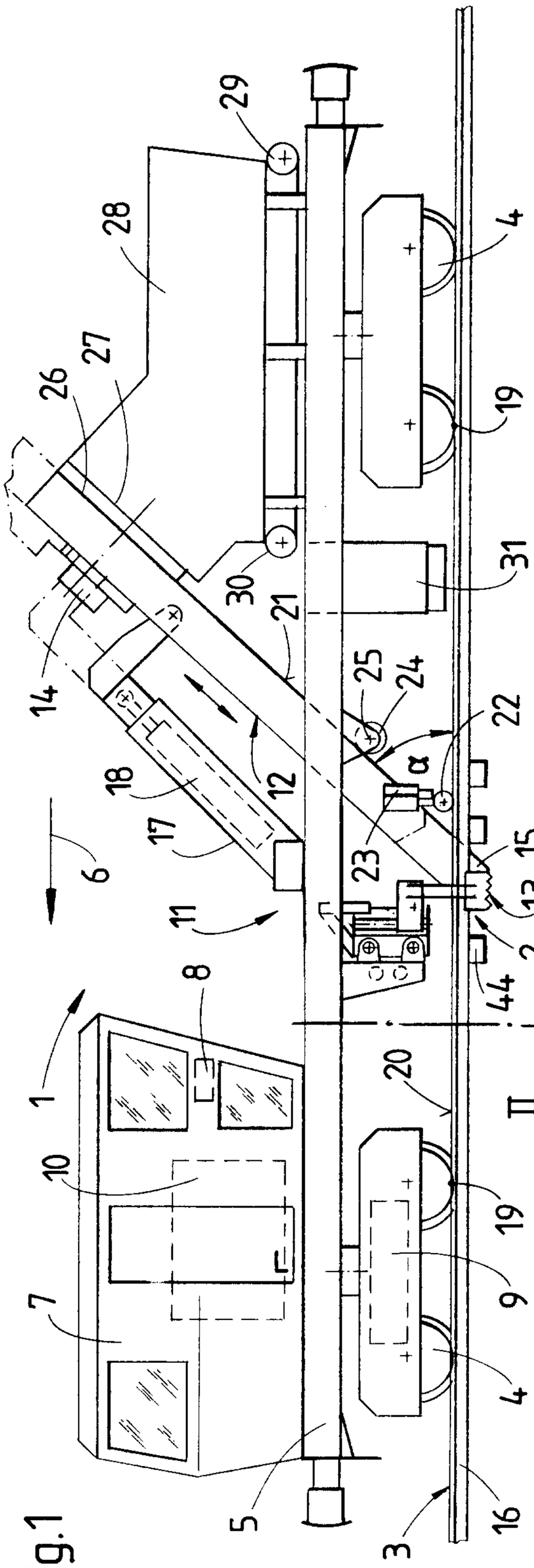
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Fig.1

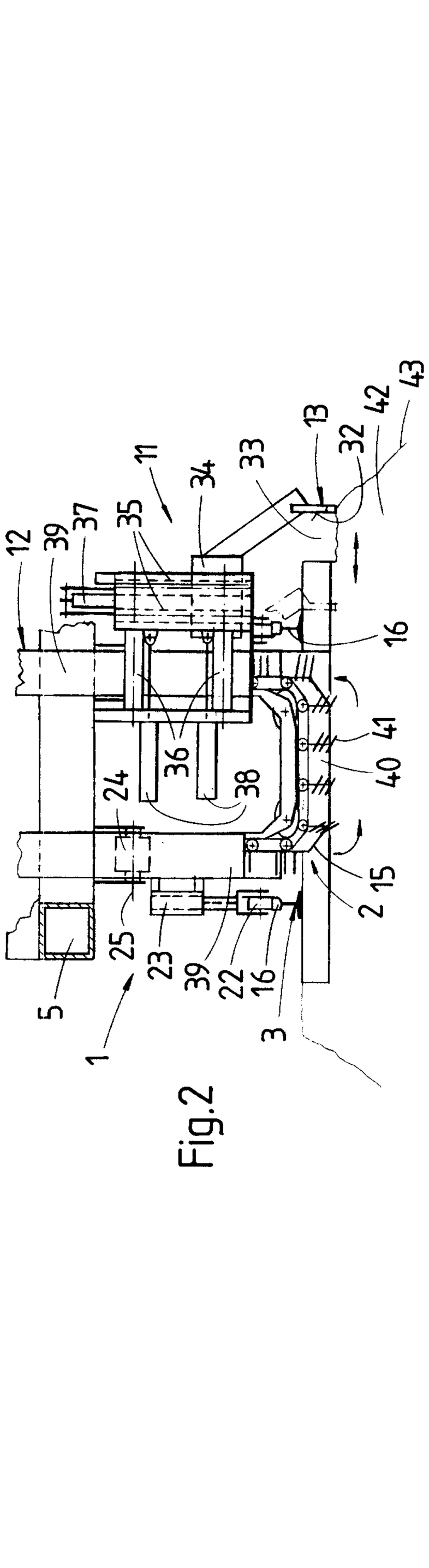
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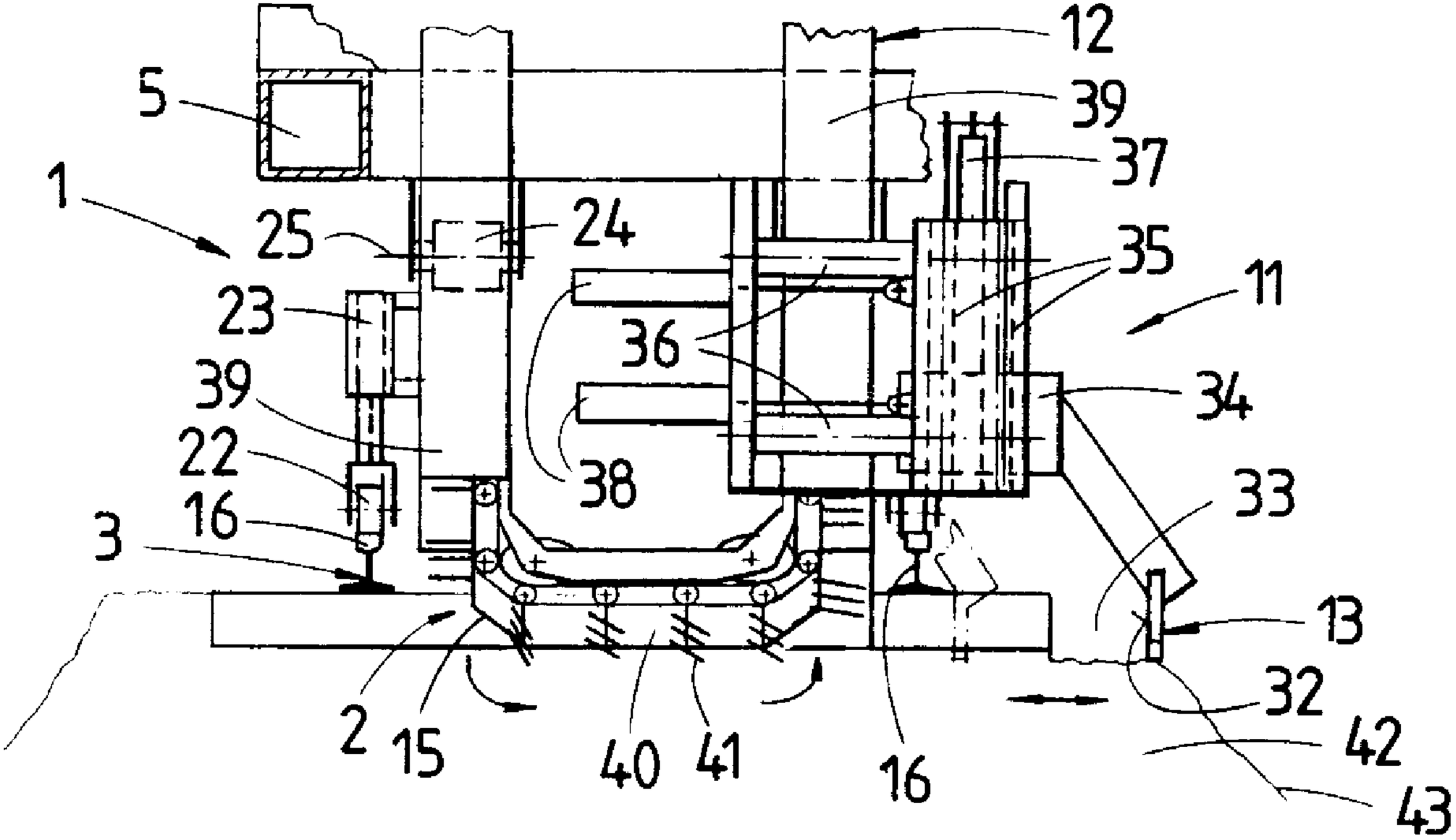
Fig.2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