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CA 2570586 C 2013/03/12

(11)(21) 2 570 586

(12) BREVET CANADIEN
CANADIAN PATENT

(13) C

(86) Date de dépôt PCT/PCT Filing Date: 2005/05/18
(87) Date publication PCT/PCT Publication Date: 2006/01/26
(45) Date de délivrance/Issue Date: 2013/03/12
(85) Entrée phase nationale/National Entry: 2006/11/29
(86) N° demande PCT/PCT Application No.: EP 2005/052284
(87) N° publication PCT/PCT Publication No.: 2006/008202
(30) Priorité/Priority: 2004/07/19 (AT GM 511/2004)

(51) Cl.Int./Int.Cl. *E01B 29/06* (2006.01)

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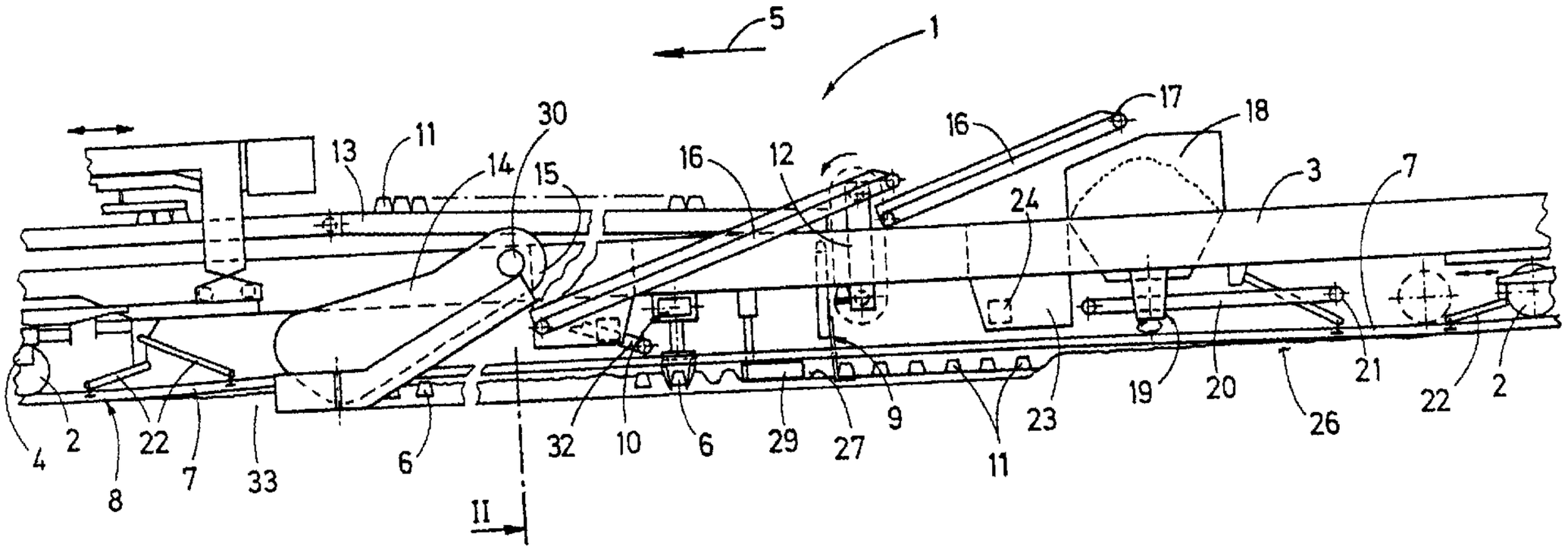
(54) Titre : PROCEDE POUR REMPLACER D'ANCIENNES TRAVERSES D'UNE VOIE DE CHEMIN DE FER PAR DE NOUVELLES TRAVERSES

(54) Title: METHOD FOR REPLACING OLD SLEEPERS OF A RAILWAY TRACK BY NEW SLEEPERS



(57) Abrégé/Abstract:
The aim of the invention is to replace old ties (6) of a railway track (8) by new ties (11). This aim can be achieved by spreading the two rails (7) apart from each other. The reception of ballast gravel (26) for producing a recess of ballast is carried out in a region below of the sleeper head (25) of a ballast bed (33), which is located adjacent to the region of the old sleepers (6) along their longitudinal axis. The received ballast gravel is temporarily stored and, once the new sleepers (11) have been deposited, thrown off for the purpose of ballasting. In parallel and prior to the deposit of new sleepers (11), excess ballast gravel (26) is ploughed in the recess of ballast so as to produce a levelled surface of ballast (27).

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro

PCT

(43) Internationales Veröffentlichungsdatum
26. Januar 2006 (26.01.2006)

(10) Internationale Veröffentlichungsnummer
WO 2006/008202 A1

(51) Internationale Patentklassifikation[7]: E01B 29/06

(21) Internationales Aktenzeichen: PCT/EP2005/052284

(22) Internationales Anmeldedatum:
18. Mai 2005 (18.05.2005)

(25) Einreichungssprache: Deutsch

(26) Veröffentlichungssprache: Deutsch

(30) Angaben zur Priorität:
GM 511/2004 19. Juli 2004 (19.07.2004) AT

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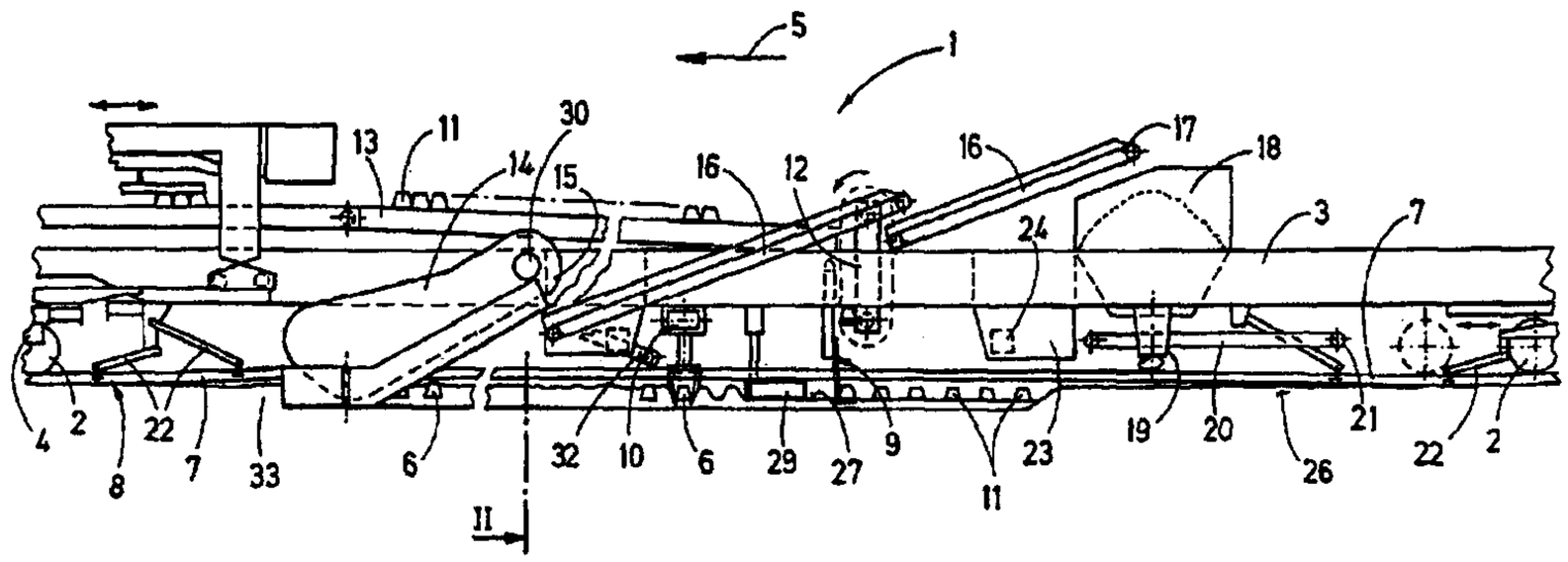
Veröffentlicht:
— *mit internationalem Recherchenbericht*

Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

(54) **Title:** METHOD FOR REPLACING OLD SLEEPERS OF A RAILWAY TRACK BY NEW SLEEPERS

(54) **Bezeichnung:** VERFAHREN ZUM ERSETZEN VON ALTSCHWELLEN EINES GLEISES DURCH NEUSCHWELLEN.



(57) **Abstract:** The aim of the invention is to replace old ties (6) of a railway track (8) by new ties (11). This aim can be achieved by spreading the two rails (7) apart from each other. The reception of ballast gravel (26) for producing a recess of ballast is carried out in a region below of the sleeper head (25) of a ballast bed (33), which is located adjacent to the region of the old sleepers (6) along their longitudinal axis. The received ballast gravel is temporarily stored and, once the new sleepers (11) have been deposited, thrown off for the purpose of ballasting. In parallel and prior to the deposit of new sleepers (11), excess ballast gravel (26) is ploughed in the recess of ballast so as to produce a levelled surface of ballast (27).

(57) **Zusammenfassung:** Zum Ersetzen von Altschwellen (6) eines Gleises (8) durch Neuschwellen (11) werden beide Schienen (7) seitlich auseinandergespreizt. In einem in Schwellenlängsrichtung an die Altschwellen (6) anschließenden Schwellenvorkopfbereich (25) einer Schotterbettung (33) erfolgt die Aufnahme von Schotter (26) zur Herstellung einer Bettungsvertiefung. Der aufgenommene Schotter wird zwischengespeichert und nach Ablage der Neuschwellen (11) zur Einschotterung derselben abgeworfen. Parallel dazu wird vor Ablage der Neuschwellen (11) zur Herstellung eines Schotterplanums (27) überschüssiger Schotter (26) in die Bettungsvertiefung gepflügt.

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Method for Replacing Old Sleepers of a Railway Track by New Sleepers

The invention relates to a method for replacing old sleepers of a track by new sleepers, wherein rails which have been detached from the old sleepers are spread apart laterally and a ballast formation is created before laying down the new sleepers.

Machines of this type for renewing the sleepers and/or the rails of a track are known, for example, from EP 1 195 468 Al or US 5 664 498.

The object of the present invention lies in providing a method of the specified kind with which a simplified exchange of sleepers is possible.

Accordingly, in one aspect the present invention resides in a method for replacing old ties of a railroad track with new ties comprising the steps of detaching rails from the old ties; spreading the rails apart from one another laterally; picking up ballast in a tie pre-head region of a ballast bed adjoining the old ties in a longitudinal direction of the old ties for producing a bed depression; temporarily storing the picked-up ballast; picking up the old ties; producing a ballast level while plowing surplus ballast into the bed depression; laying down the new ties; and discharging the stored ballast for ballasting the new ties.

Owing to the formation of a bed recess, it is possible to carry out in a structurally very simple manner a removal of ballast situated above the ballast formation. Furthermore, it is possible thereby to reduce the distance between the two devices for sleeper removal and sleeper laying and thus also the length of the machine frame as required for bridging the construction gap.

Additional advantages of the invention become apparent from the drawing.

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

Fig. 1 shows a side view of a machine for exchanging damaged sleepers, and
Fig. 2 shows a simplified cross-section of a ballast bed.

A machine 1 comprises a machine frame 3, supported at the ends on on-track undercarriages 2 during working operations, and is mobile by means of a motive

drive 4 in a working direction 5 on a track 8 formed by old sleepers 6, or new sleepers 11, and rails 7.

Approximately centrally between the two on-track undercarriages 2 placed at the ends, a device 10 for picking up the old sleepers 6 as well a device 9 for laying down the new sleepers 11 are provided. Said new sleepers 11 are received by a vertical conveyor 12 from a conveyor belt 13 and placed on a ballast formation 27 of a ballast bed 33. Located between the two devices 9 and 10 is a ballast plough 29 which is vertically adjustable by drives and V-shaped when seen in top view.

A vertically and transversely adjustable endless shoulder chain 14 is connected to the machine frame 3 in front of the device 10 for picking up the old sleepers 6, with regard to the working direction 5. The shoulder chain 14 is rotatable by means of a drive 30 in a plane which extends perpendicularly to the plane of the ballast formation 27 and in the longitudinal direction of the machine.

Associated with a discharge opening 15 of the shoulder chain 14 is a conveyor belt 16 having a discharge end 17. The latter is situated above a ballast hopper 18 - positioned between the rear on-track undercarriage 2 and the device 9 for laying down the new sleepers 11 - which comprises a discharge arrangement 19. The latter is in the shape of a discharge conveyor belt 20, having a discharge end 21, which is fastened to the ballast hopper 18 for rotation about a vertical axis. Vertically and transversely adjustable rail guides 22 are located between the two on-track undercarriages 2 arranged at the ends. A control device 24 is associated with a work cabin 23.

The method of renewing sleepers will be described in more detail below.

At the start of working operations, the two rails 7 detached from the old sleepers 6 are spread apart from one another, with the aid of the rail guides 22, to a distance exceeding the sleeper length. With the machine 1 advancing in the working direction 5, ballast 26 present in a sleeper end region 25 (see Fig. 2) is picked up by lowering the shoulder chain 14 and discharged via the conveyor

belt 16 into the ballast hopper 18. In the process, a bed recess 31 is created by the picking-up of ballast.

By means of the device 10 following behind, the old sleepers 6 are gripped and laid upon a conveyor belt 32 for being transported away. Thereafter, surplus ballast 26 is ploughed or shifted by means of the ballast plough 29 in the direction towards the bed recess 31, thus creating the ballast formation 27. Immediately following this, the new sleepers 11 are laid down by means of the device 9. In further sequence, the spread-apart rails 7 are brought together again to gauge width and laid upon the new sleepers 11. Immediately in front of the rear on-track undercarriage 2, stored ballast 26 is discharged via the discharge conveyor belt 20 in order to fill up cribs located between the new sleepers 11.

Within the scope of the invention, it is possible to either employ two shoulder chains 14, lying opposite one another in the transverse direction of the machine, or also only one shoulder chain 14.

We claim:

1. A method for replacing old ties of a railroad track with new ties comprising the steps of:

(a) detaching rails from the old ties;

(b) spreading the rails apart from one another laterally;

(c) picking up ballast in a tie pre-head region of a ballast bed adjoining the old ties in a longitudinal direction of the old ties for producing a bed depression;

(d) temporarily storing the picked-up ballast;

(e) picking up the old ties;

(f) producing a ballast level while plowing surplus ballast into the bed depression;

(g) laying down the new ties; and

(h) discharging the stored ballast for ballasting the new ties.

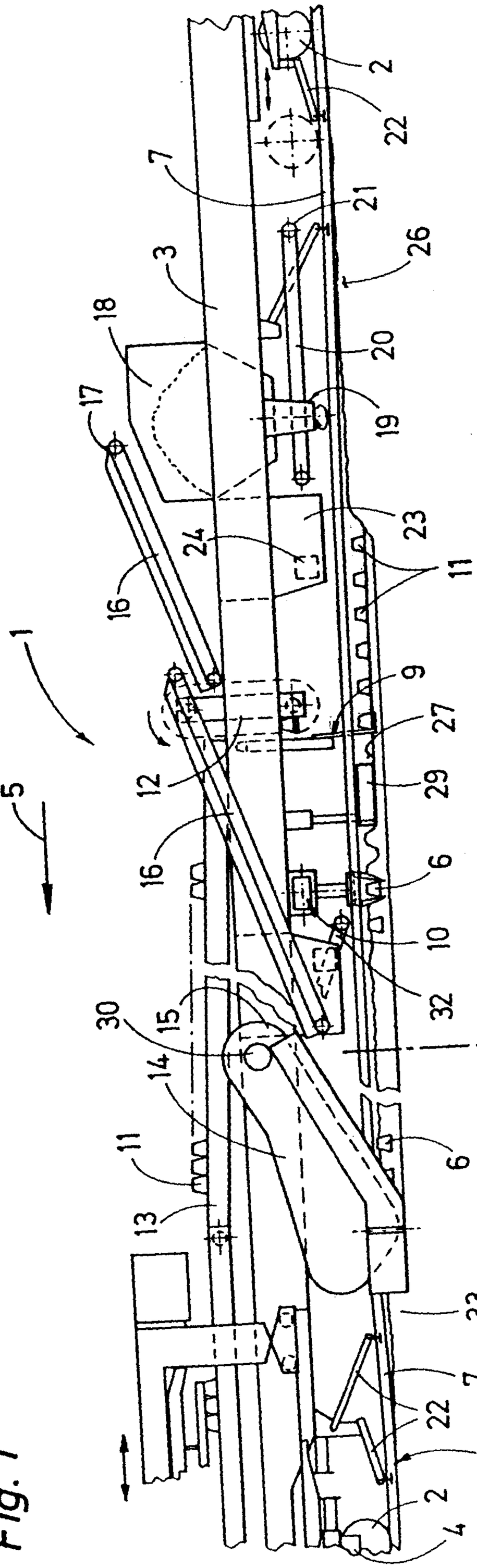
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Fig. 1

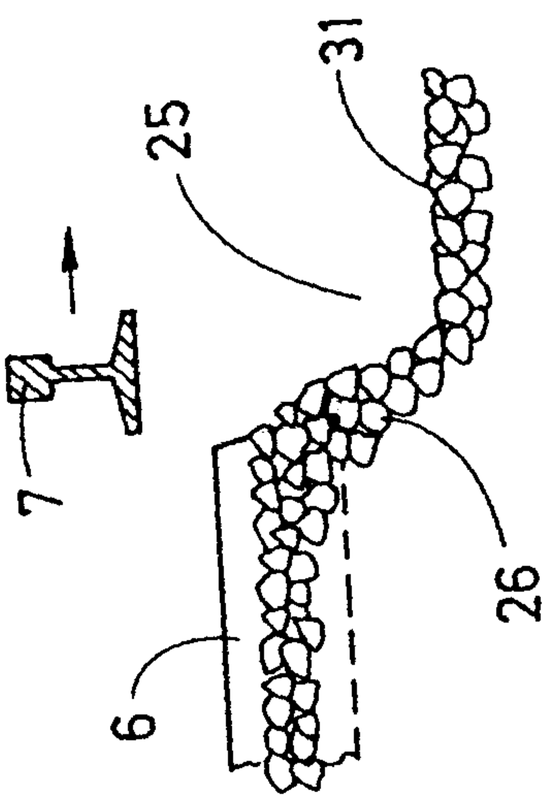
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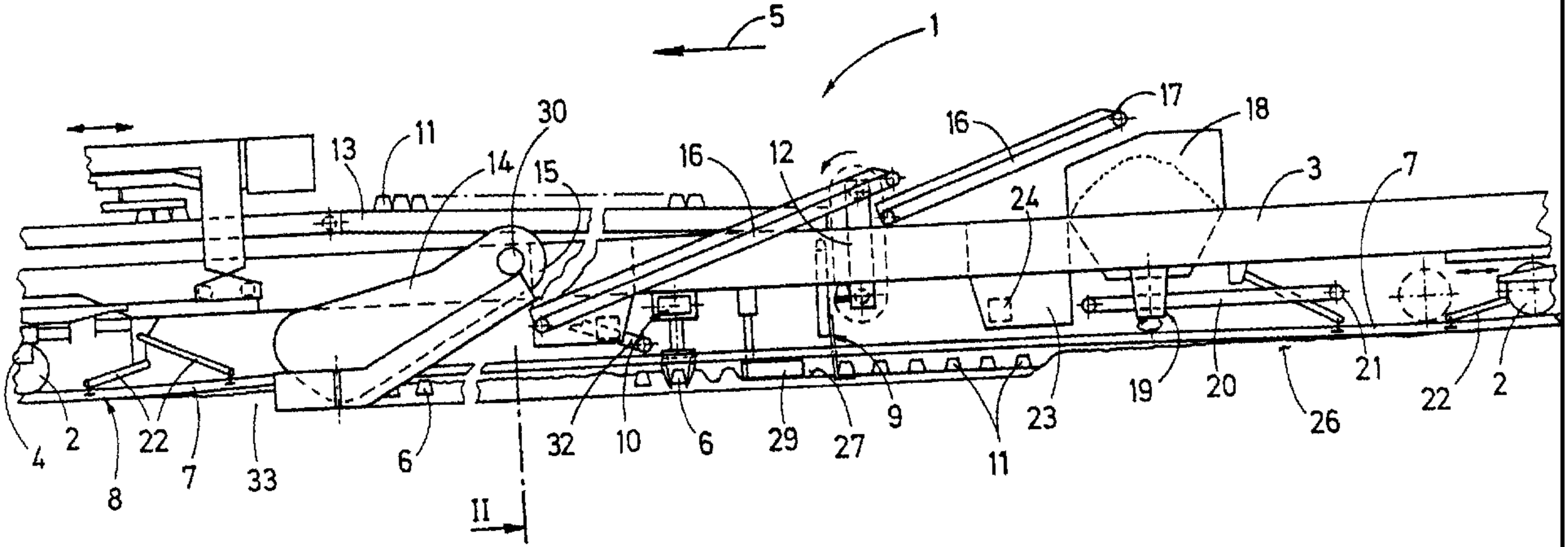
Fig. 2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