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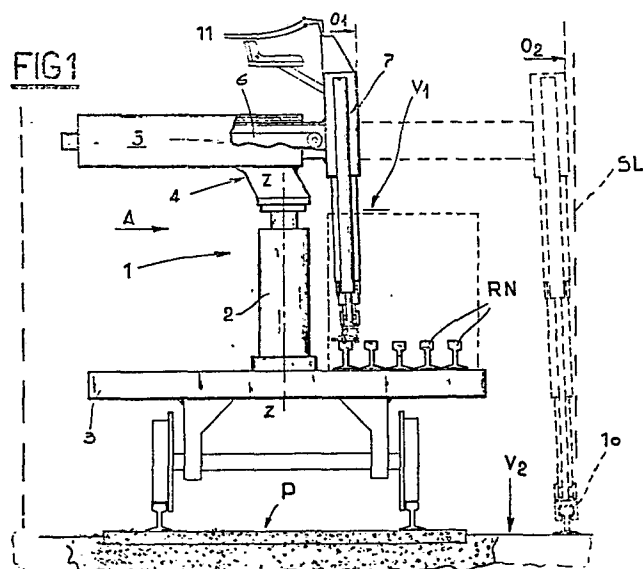
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54 **A device for loading and unloading along the track, objects, particularly rails, on to and from railway trucks.**

57 The device has a crane with which it is possible to unload (or load) objects such as rails from the charging platform of a railway truck on to the ballast surface at the side of the line constituting the railway track in operation, without in any way deviating from the clearance gauge laid down in railway regulations. This is achieved through the use of a vertical turret (2) at the top of which is placed, in a way whereby it is able to rotate around the vertical axis thereof, a central module (4) that comprises a first arm (5) placed horizontally and extensible horizontally between two limit positions under the action of first hydraulic operating means (6); to the free extremity of the said first arm is connected a second arm (7) placed vertically and extensible vertically between the two limit positions for loading the rail on to the truck and for unloading the rail on to the ballast, under the action of second hydraulic operating means (8-9); the said second arm being provided, in the extremity of the free extremity thereof, with a hooking element (10).



A device for loading and unloading along the track, objects, particularly rails, on to and from railway trucks

In the maintenance of railway tracks, and in particular when renewing them, the problem exists of having to initially place the new rails that are to replace the old ones that constitute the railway line in operation, at the side  
5 of the latter, on the surface of the ballast and then, once the renewal has been effected, of removing the old, no longer utilisable, rails.

At present these operations are carried out using trains  
10 made up of trucks, on which the new rails are rested lengthwise, which are provided longitudinally with a number of loading/unloading devices, each of which constituted by a central, vertical, turret at the top of which is placed a transverse arm on which slides a bogie equipped with a  
15 hoist which, through manual operations, hooks on to a rail placed on the floor of the truck and, after having raised the rail from the floor and the bogie has been made to slide horizontally along the transverse arm (again through manual operations), lowers the said rail until it has been  
20 deposited on the surface of the ballast (see Figure 3a).

This modus operandi, in addition to requiring a considerable labour force since it is necessary to have one operator on the truck and one on the ground, with operations  
25 that take, moreover, some time to complete, cannot be employed along the bends described by the track since the cable of the hoist, because of the sleepers in the said sections being inclined by gravity (see Figure 3b), forces the said track to exceed, in the region of where it rests  
30 on the ballast, the maximum overall dimensions (or clearance gauge) permitted by railway regulations (shown in the figure with dots and dashes), especially in the case of a

double track where rolling stock is continuing to pass alongside the line undergoing maintenance.

The essential object of the invention is, therefore, to  
5 overcome the aforementioned difficulties by making available a device for loading and unloading along the track, objects such as rails, on to and from railway trucks, that is able to perform the said operations with a reduced amount of labour and with the certainty of never exceeding,  
10 during any operation, the prescribed overall dimensions or clearance gauge, and to do this using methods that are extremely simple and for this reason, cheap.

This and other objects too are all attained with the invention forming the subject herein, which is characterized  
15 by the fact of comprising, secured to the charging platform of a truck: a vertical turret, to the upper part of which is fastened, in a way whereby it is able to rotate around the vertical axis of the turret, a central module  
20 that comprises a first arm placed horizontally and extensible horizontally between two limit positions under the action of first operating means, without the possibility of the said first arm rotating with respect to the said turret or vice versa, in a vertical plane; and a second  
25 arm, connected to the free extremity of the said first arm without the possibility of one rotating with respect to the other, placed vertically and extensible vertically between two limit positions under the action of second operating means, for loading the rail on to the truck and  
30 for unloading the rail on to the ballast, respectively.

Further characteristics and advantages of the invention will become more apparent from the detailed description that follows of one form of embodiment, illustrated purely  
35 as an unlimited example on the accompanying drawings, in

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which:

Figure 1 shows, in a lateral diagrammatic view with certain parts in sectional form, the device forming the subject of the invention, mounted on a railway truck, in the position of loading the rail on to the truck (solid line) and in the position of unloading the rail on to the ballast (broken line), respectively;

Figure 2 shows, in a view from A in Figure 1, the moving parts of the second arm of the device in question;

Figure 3 shows, in a diagrammatic view, the method employed for the devices previously to the one in question;

Figure 4 shows, in the same diagrammatic view as in Figure 3, the device in question operating in the region of a sloping section of the track.

With reference in particular to Figures 1 and 2, shown globally at (1) is the device in question, which comprises a vertical turret (2) integral, in the centre position, with the floor of a truck (3) that constitutes the charging platform for the new rails (RN). Fixed to the upper part of the said turret, in a way whereby it is able to rotate around the vertical axis z-z of this, is a central module (4) constituted by a first arm (5) placed horizontally and extensible horizontally (constituted, for example, by a number of telescopic elements, as shown on the drawing), under the action of an oil hydraulic jack (6), between two extreme positions shown on the drawing with a solid line (01) and a broken line (02), respectively.

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To the said first arm, or to be more precise, to the free extremity thereof is fastened a second arm (7) (without the possibility of one rotating with respect to the other along the vertical plane shown in Figure 1), this being this being extensible vertically (also composed of a num-

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ber of telescopic elements, as shown in Figures 1 and 2) under the action of a pair of oil hydraulic jacks (8) and (9), placed in series one with the other, between two extreme positions that can be seen in Figure 1 at ( $V_1$ ) and  
5 ( $V_2$ ), respectively.

The free extremity of the said second arm (7) is provided with hooking means (10) for grasping the rails (RN) and for laying them on to the surface (P) of the ballast, at  
10 the side of the railway line in operation.

The manoeuvring of the device in question, through control means (11), is extremely simple since all that has to be done in order to cause the hooking means (10) to adopt the  
15 required positions for loading the rail on to the truck and for unloading it on to the ballast, is to actuate the withdrawal of the two arms (5) and (7) (movable virtually along two cartesian coordinates and in a vertical plane). The latter position is most important on account of what  
20 has been stated above regarding the need not to exceed, during the said operation, the clearance gauge shown on the drawing at (SL).

It can be seen that, with the method outlined, the fore-  
25 going is ensured since the arms of the device are rigidly connected with respect to one another and with respect to the turret, whilst their extension (particularly as regards the first horizontal arm (5)) is rigorously controlled. In this way, the overall dimensions required for  
30 the gauge (SL) are strictly respected not only in the rectilinear position but also in the region of the inclination adopted by the truck on a bend (see Figure 4).

The slight vertical inclination of the second arm (7) has been studied in order to make full use of the volume per-

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mitted with the variation in the diameter of the telescopic elements that constitute the said arm.

Obviously the position shown in Figure 1 can be overturned  
5 through 180° by a simple rotation of the control module  
(4) around the vertical axis z-z of the turret (2).

In its practical form of embodiment, the invention can also  
adopt forms that differ from what has been described above  
10 and, in particular, numerous modifications of a practical  
nature may be introduced without, in any way, deviating  
from the framework of protection afforded to the invention.

## Claims:

1. A device for loading and unloading along the track, objects, particularly rails, on to and from railway trucks, characterized by the fact of comprising, secured to the charging platform of the said truck: a vertical turret  
5 (2), to the upper part of which is fastened, in a way whereby it is able to rotate around the vertical axis of the turret (2), a central module (4) that comprises a first arm (5) placed horizontally and extensible horizontally between two limit positions under the action of first oper-  
10 ating means (6), without the possibility of the said first arm (5) rotating with respect to the said turret (2) or vice versa, in a vertical plane; and a second arm (7), connected to the free extremity of the said first arm (5) without the possibility of one rotating with respect to  
15 the other, placed vertically and extensible vertically between two limit positions under the action of second operating means (8-9), for loading the rail on to the truck and for unloading the rail on to the ballast, respectively.

FIG2

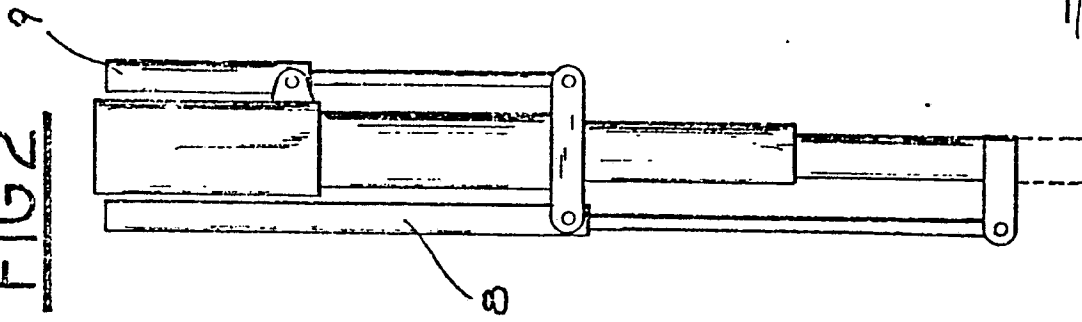


FIG1

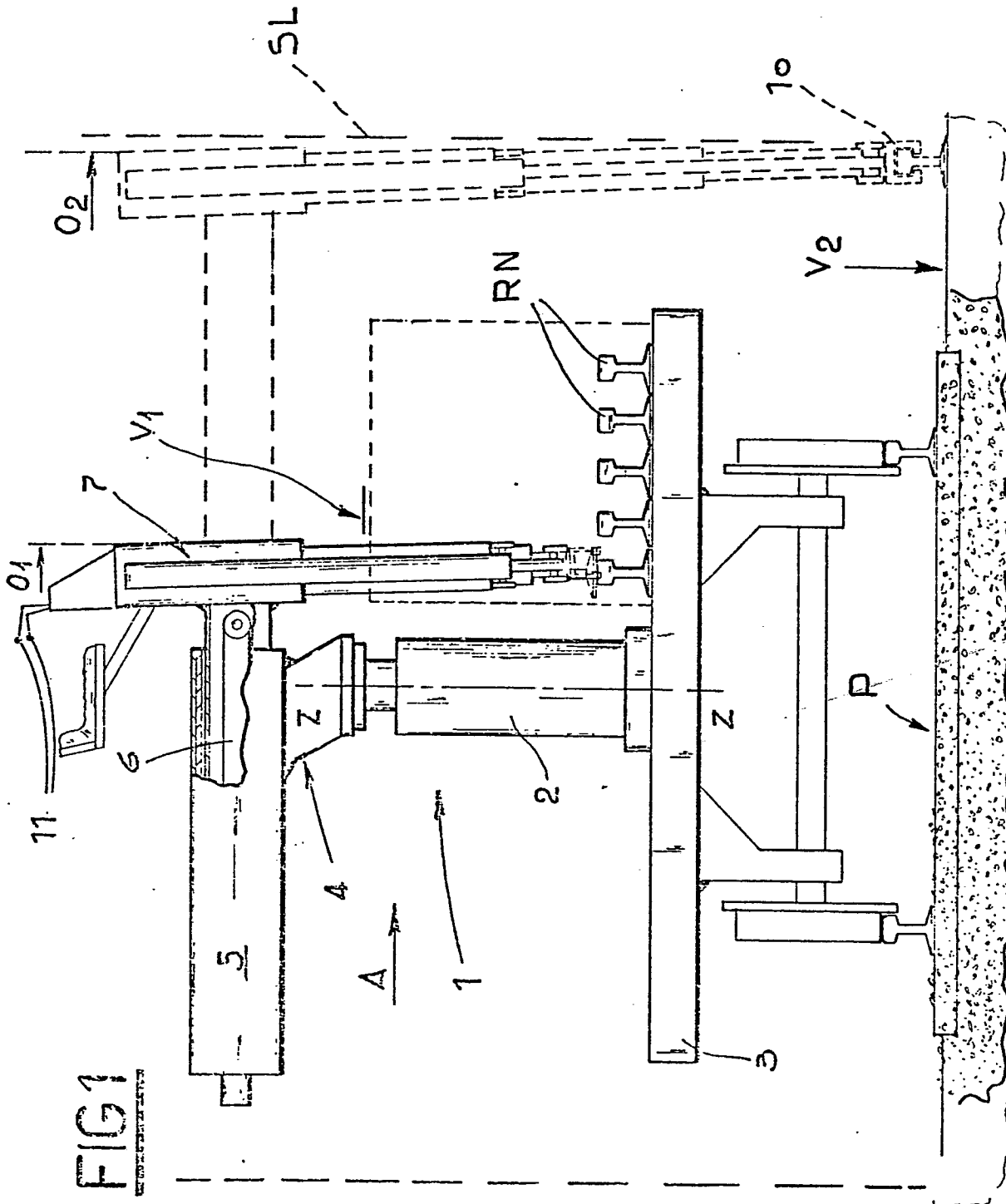


FIG 3a

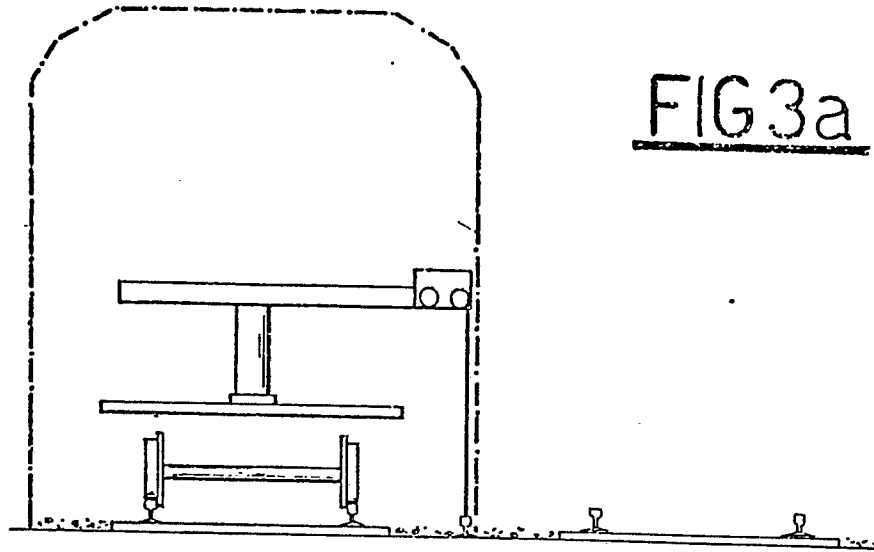


FIG 3b

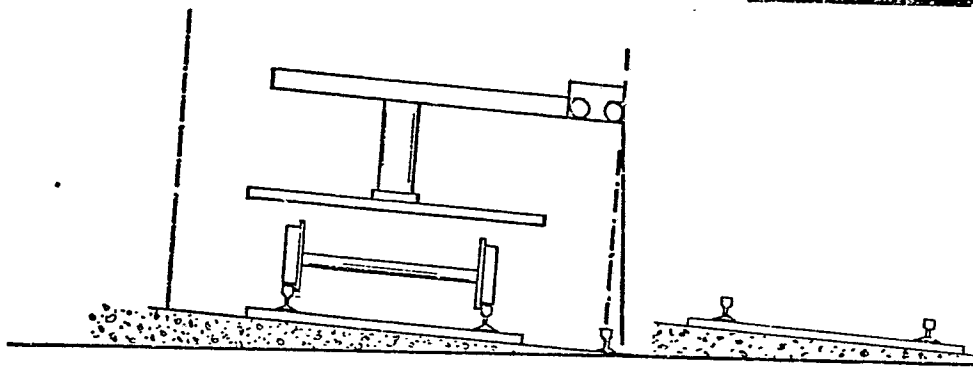
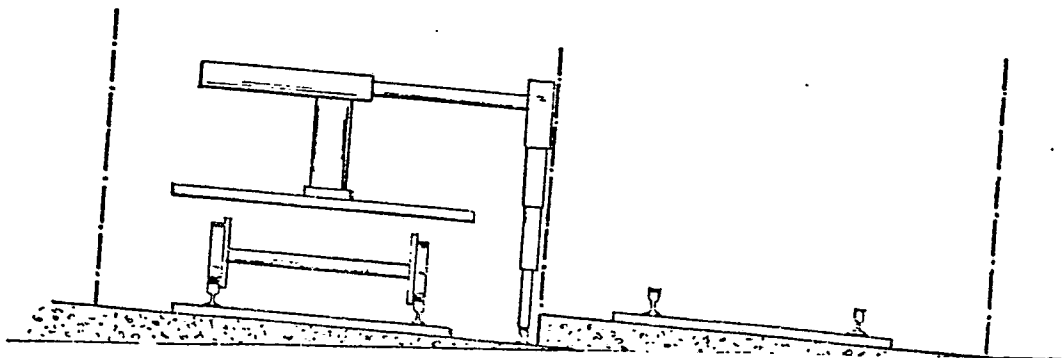


FIG 4





European Patent  
Office

# EUROPEAN SEARCH REPORT

0044819

Application number  
EP 81 83 0103

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                            |                                                                                                                                                                                                 |                   | CLASSIFICATION OF THE APPLICATION (Int. Cl. <sup>3</sup> )                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Category                                                                                       | Citation of document with indication, where appropriate, of relevant passages                                                                                                                   | Relevant to claim |                                                                                                                                                                                                                                                                            |
|                                                                                                | <u>US - A - 3 074 562 (CLAYBORNE)</u><br>* Column 1, lines 63-71; column 2, lines 1-50; figures 1,4 *                                                                                           | 1                 | E 01 B 29/16                                                                                                                                                                                                                                                               |
|                                                                                                | --                                                                                                                                                                                              |                   |                                                                                                                                                                                                                                                                            |
|                                                                                                | <u>FR - A - 1 141 116 (GEISMAR)</u><br>* Page 1, right-hand column, paragraphs 8,9,10,11; page 2, left-hand column, paragraphs 1,2,3,7,8,9; page 2, right-hand column, paragraph 1 ; figure 1 * | 1                 |                                                                                                                                                                                                                                                                            |
|                                                                                                | --                                                                                                                                                                                              |                   | TECHNICAL FIELDS SEARCHED (Int. Cl. <sup>3</sup> )                                                                                                                                                                                                                         |
| A                                                                                              | <u>FR - A - 1 043 372 (DUMEZ)</u>                                                                                                                                                               |                   | E 01 B                                                                                                                                                                                                                                                                     |
| A                                                                                              | <u>FR - A - 1 574 169 (DURAND)</u><br>-----                                                                                                                                                     |                   |                                                                                                                                                                                                                                                                            |
|                                                                                                |                                                                                                                                                                                                 |                   | CATEGORY OF CITED DOCUMENTS                                                                                                                                                                                                                                                |
|                                                                                                |                                                                                                                                                                                                 |                   | X: particularly relevant<br>A: technological background<br>O: non-written disclosure<br>P: intermediate document<br>T: theory or principle underlying the invention<br>E: conflicting application<br>D: document cited in the application<br>L: citation for other reasons |
|                                                                                                |                                                                                                                                                                                                 |                   | &: member of the same patent family, corresponding document                                                                                                                                                                                                                |
| <input checked="" type="checkbox"/> The present search report has been drawn up for all claims |                                                                                                                                                                                                 |                   |                                                                                                                                                                                                                                                                            |
| Place of search                                                                                | Date of completion of the search                                                                                                                                                                | Examiner          |                                                                                                                                                                                                                                                                            |
| The Hague                                                                                      | 26-10-1981                                                                                                                                                                                      | RUYMBEKE          |                                                                                                                                                                                                                                                                            |