

⑫

EUROPEAN PATENT APPLICATION

⑳ Application number: 82302623.2

⑤① Int. Cl.³: **B 61 J 3/00**
B 61 J 3/12

㉒ Date of filing: 21.05.82

③① Priority: 22.05.81 ZA 813450

④③ Date of publication of application:
08.12.82 Bulletin 82/49

⑧④ Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

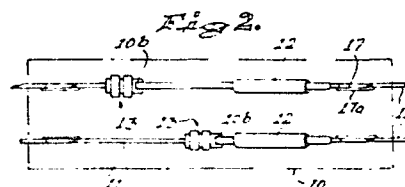
⑦① Applicant: Edward L. Bateman Limited
Bartlett Road
Boksburg North Transvaal(ZA)

⑦② Inventor: Rabinovitch, Josef Kivvovich
16 Eleventh Avenue
Northmead Benoni Transvaal(ZA)

⑦④ Representative: Pratt, David Martin et al,
Brookes & Martin High Holborn House 52 54 High
Holborn
London. WC1V 6SE(GB)

⑤④ Drive system and method for moving a vehicle along a rail track.

⑤⑦ A drive assembly for a rail mounted vehicle (10) comprising a ram (12) which reciprocates through a drive cycle and a return cycle. One end of the ram (12) is secured to the vehicle (10) while the other end is provided with a clamp (13). The clamp (13) is adapted to clamp a rail (11) on which the vehicle (10) is mounted synchronously with the cyclic operation of the drive assembly so that the vehicle is pushed or pulled along the rail. The invention also relates to a method of moving a vehicle along a rail.



- 1 -

Drive system and method for moving a vehicle
along a rail track.

5 This invention relates to a drive system for a rail
mounted vehicle, and to a method of moving such a
vehicle along a rail track.

10 Pusher devices for moving railway vehicles through
loading and unloading stations are known, and are also
in fairly common usage in railway yards to reduce
shunting activities. It is, for example, known to
provide means for moving a railway vehicle through a
loading or unloading station which includes at least
one actuator adapted to be mounted on the railway
15 vehicle and to be operated cyclically with successive
extension and retraction strokes. The or each actuator
is provided with means adapted to engage and release
anchor means located along the track of the vehicle;
the arrangement being such that, through engagement
20 with the anchor means, the actuator pulls or pushes
the vehicle on which it is mounted through a
predetermined distance during each extension and
retraction cycle. A disadvantage of the above system
is that the provision of the anchor means along the
25 track can be relatively costly, and it is accordingly
an object of the present invention to provide a novel
drive system which it is believed will minimise this
disadvantage.

- 2 -

According to the invention a drive system for a rail mounted vehicle comprises a drive assembly adapted to be mounted on the vehicle and to be operated cyclically having a drive cycle and a non-drive cycle; the drive
5 assembly including engagement means adapted to engage and release the track on which the vehicle is mounted synchronously with the cyclic operation of the assembly; the arrangement being such that, during the drive cycle of the drive assembly, the engagement means engages the track
10 so that the drive assembly pushes or pulls the vehicle along the track; and, during the non-drive cycle of the drive assembly, the engagement means releases the track and is advanced therealong.

For most applications it is envisaged that the
15 engagement means will be clamping means adapted to clamp onto the rail, although it is also intended to include within the scope of the invention an arrangement wherein the engagement means abuts formations on the rail. Preferably the operating assembly will be in the nature
20 of a reciprocable, fluid operable ram, adapted to have one end thereof secured to the vehicle, while the other end terminates in the engagement means. In an alternative arrangement, the drive assembly could be adapted to perform rotary or reciprocating arcuate

- 3 -

movement, but such an arrangement is not preferred.

Preferably also a pair of drive assemblies is provided and adapted to operate sequentially so as to move the train along the rail in a substantially uninterrupted manner. Where the vehicle is mounted on a single rail, the drive assemblies may be mounted one behind the other, and with a double rail the drive assemblies could be thus mounted or be mounted adjacent one another. It will be appreciated that various possibilities will present themselves with regard to the disposition of the drive assemblies.

Still further according to the invention, where the engagement means is in the nature of a clamp, the latter includes a clamping jaw and a lever system adapted to operate the jaw. The lever system may in turn be operated by an electrical actuator, fluid actuator, or the like. In one arrangement, the clamp could comprise a pair of opposed first degree levers which define the clamping jaw towards their one pair of ends, and with actuating means being provided at the other pair of ends to move these towards or away from one another to effect

- 4 -

the release or clamping of the jaw formations. Doubtless many variations are possible with regard to the clamp but in all instances, it is preferred that the cross-sectional width of the clamping jaws do not exceed the width of a conventional wheel flange so that the clamping jaw will be afforded the same passage as the wheel flange on a rail.

Also included within the scope of the invention, is a method of moving a rail mounted vehicle along a rail comprising the steps of providing a drive assembly on the vehicle, causing the drive assembly to operate cyclically through a drive cycle and a non-drive cycle; causing the drive assembly to engage the rail on which the vehicle is mounted during its drive cycle so that the vehicle is pushed or pulled along the rail; and causing the drive assembly to release the rail during its non-drive cycle to advance the drive assembly relative to the rail. The drive assembly will engage the rail by means of a clamping operation.

Further according to this aspect of the invention, a pair of drive assemblies is provided and adapted to operate

- 5 -

sequentrally so that the vehicle is moved along the rail in a substantially uninterrupted manner.

Still further according to the invention, the drive assembly is reciprocated to perform its cyclical operations.

In order more clearly to illustrate the invention, an embodiment thereof is described hereunder purely by way of example with reference to the accompanying drawings wherein :

10 Figure 1 is a schematic elevation of a rail mounted vehicle provided with the drive means of the invention,

Figure 2 is a schematic plan of the arrangement in Figure 1, and

15 Figure 3 is a schematic, enlarged, end elevation of clamp means which forms part of the drive assembly in Figure 1.

- 6 -

Referring to the drawings, a drive assembly for a vehicle 10, which is mounted on a pair of spaced rails 11, comprises a pair of hydraulic rams 12 each provided with a clamp mechanism 13 pivotally mounted, at 10b, at the leading ends thereof. As shown in Figure 2, the rams 12 are mounted pivotally on the vehicle 10, at 10a, and are disposed adjacent one another with each ram in vertical alignment with a rail 11, so that one ram acts on one rail and the other on the other rail. In an alternative arrangement, the rams may be mounted one in front of the other so that both act on the same rail, if such an arrangement is desirable for one reason or the other.

In use, the rams 12 will reciprocate sequentially and the clamps 13 will clamp onto the rails 11 during the power stroke of the rams 12 and release the rails 11 during the return stroke, and in such manner move the vehicle 10 along the rails 11 in a substantially uninterrupted manner. It will be appreciated that a single ram 12 and clamp 13 could also move the vehicle 10 along the rails 11 but in such a case movement will be periodic.

- 7 -

In the arrangement illustrated the clamp 13 comprises a pair of opposed first degree levers 14 which are pivotally mounted, at 15, with the one free end of each lever 14 providing a clamping tooth 18, while the other end is pivotally secured, at 16a, to an interlinking ram 16. It will be appreciated that extension of ram 16 will move the clamping teeth 18 towards one another to perform a clamping operation, while retraction of the ram 16 will have the reverse effect to move the clamping teeth 18 away from one another in the nature of a releasing action. In alternative arrangements, operation of the levers 14 could be by means of an electrical solenoid, eccentric clamps etc.

It is envisaged that the clamps 13 will clamp onto the head of a rail 11 as shown in Figure 3, and in this way the force applied to the rail 11 during operation of the rams will be mainly longitudinal with no ill effect on the rail line. It is believed that, with the arrangement of the invention, the vertical component of force generated by the rams 12 could be balanced with a relatively low ballast. It will be appreciated that, where traction is applied to wheels 17 of the vehicle 10,

- 8 -

a ballast which is four times greater than the tractive force is required. Other advantages of the arrangement of the invention will be apparent to persons skilled in the art.

5 Clearly many variations in detail of the invention exist without departing from the principles set out in the consistory clauses. For example, the width of clamping teeth 18 will preferably be equal to, or less than, the width of the flange 17a of a conventional railroad wheel
10 17, so that the teeth 18 will be afforded the same passage on the railroad line as that of the flanges 17a. The expression "rail mounted vehicle" herein means a vehicle adapted to move along a guideway, and the term "rail" must be interpreted accordingly.

- 1 -

CLAIMS:

1. A drive system for a rail mounted vehicle (10), the drive system comprising a drive assembly
5 adapted to be mounted on the vehicle and to be operated cyclically, and having a drive cycle and a non-drive cycle; the drive assembly including engagement means (13) adapted to engage and release the track (11) on which the vehicle (10) is mounted, the arrangement
10 being such that, during the drive cycle of the drive assembly, the engagement means (13) engages the track (11) so that the drive assembly pushes or pulls the vehicle (10) along the track (11); and, during the non-drive cycle of the drive assembly, the engagement
15 means (13) releases the track (11) and is advanced therealong.
2. A drive system according to claim 1, wherein a pair of drive assemblies is provided, each of the
20 drive assemblies being associated with a respective rail (11) of the track, and the drive assemblies being adapted to operate sequentially so as to move the vehicle (10) along the rails (11) in a substantially uninterrupted manner.
- 25 3. A drive system according to claim 1 or claim 2, wherein the engagement means of the or each drive assembly is clamp means (13) adapted to clamp onto the associated rail (11) during the drive cycle
30 of the drive assembly.
4. A drive system according to claim 3, wherein the or each clamp means is a clamp (13) which includes a clamping jaw (18, 18) and a lever system (14, 14) to
35 operate the jaw.

- 2 -

5. A drive system according to claim 4, wherein the or each clamp (13) comprises a pair of opposed first degree levers (14, 14), the free ends of which define clamping jaw members (18, 18), and wherein actuating means (16) are provided at the other ends of the levers (14, 14), the actuating means (16) being effective to move said other ends towards, or away from, one another to effect the release or clamping of the clamping jaw members (18, 18).

10

6. A drive system according to claim 5, for use with a vehicle (10) provided with flanged wheels (17), wherein the cross-sectional width of the clamping jaw members (18, 18) of the or each clamp (13) does not exceed the width of the wheel flanges (17a), so that the clamping jaw members (18) are afforded the same passage as a wheel flange (17a) on its rail (11).

7. A drive system according to any one of claims 1 to 6, wherein the or each drive assembly further comprises an operating assembly constituted by a reciprocable, fluid-operable ram (12) adapted to have one end thereof secured to the vehicle (10), and the other end secured to the engagement means (13).

25

8. A method of moving a rail mounted vehicle (10) along a rail (11), the method comprising the steps of providing a drive assembly on the vehicle (10), causing the drive assembly to operate cyclically through a drive cycle and a non-drive cycle; causing the drive assembly to engage the rail (11) on which the vehicle (10) is mounted during its drive cycle; causing the vehicle (10) to be pushed or pulled along the rail (11) by the drive assembly; causing the drive assembly to release the rail (11) during its non-drive cycle;

35

- 3 -

and advancing the drive assembly relative to the rail (11).

9. A method according to claim 8, wherein the drive assembly engages the rail (11) by means of a clamping operation.

10. A method according to claim 8 or claim 9, wherein a pair of drive assemblies is provided, the method further comprising the step of operating the drive assemblies sequentially so that the vehicle (10) is moved along the rail (11) in a substantially uninterrupted manner.

11. A method according to any one of claims 8 to 10, wherein the or each drive assembly is reciprocated to perform its cyclical operation.

Fig 1.

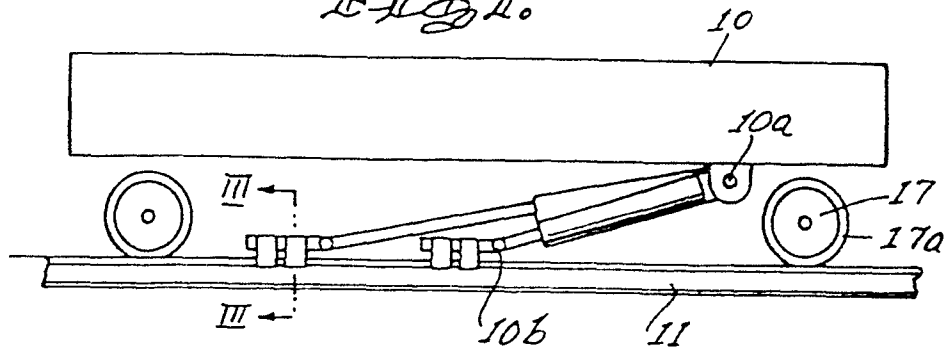
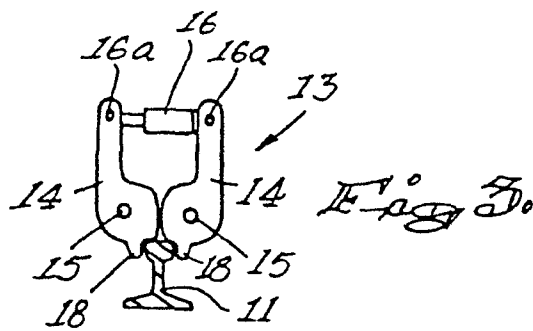
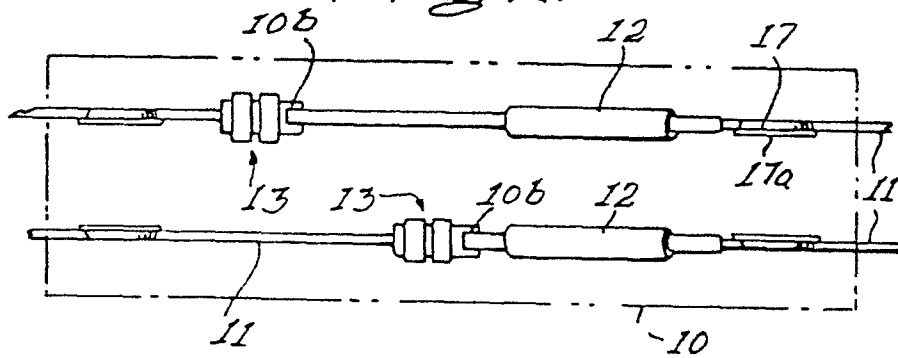


Fig 2.





European Patent
Office

EUROPEAN SEARCH REPORT

0066433

Application number

EP 82 30 2623

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	DE-C- 40 751 (LAPAGE) * Page 1, left-hand column, paragraphs 1-3 and paragraph 5 - page 2, right-hand column, paragraph 3; figures 1-12 *	1-11	B 61 J 3/00 B 61 J 3/12
A	GB-A- 864 073 (MONNINGHOFF)		
A	DE-A-1 605 362 (PHB)		
A	GB-A-1 231 780 (ARESCO TRAKCHIEF PROPRIETARY)		
			TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			B 61 J
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25-08-1982	Examiner GROTZINGER J. P.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			