

# PATENT SPECIFICATION

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## (54) COUPLING DEVICES FOR ENDLESS TOWING CONVEYORS

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 Germany, do hereby declare the invention,  
 for which we pray that a patent may be  
 granted to us, and the method by which it is  
 to be performed, to be particularly described  
 10 in and by the following statement:—

15 The invention relates to endless towing  
 conveyors, in which trucks run on appropriate  
 rails arranged laterally to a towing means, for  
 example a chain, and in particular to coupling  
 devices between the towing chain and the  
 trucks, which permit propulsion of the trucks  
 20 by the towing chain and also release of the  
 trucks from the towing chain.

25 Such coupling devices are known in various  
 forms. Usually entrainment devices are pro-  
 vided therein on the towing chain, which pro-  
 ject into the conveyance path of the trucks  
 or parts thereof. These entrainment means are  
 30 arranged as entrainment fingers or entrain-  
 ment levers which are pivotable about an axis  
 extending transversely to the direction of  
 conveyance and lockable in an appropriate  
 entrainment casing on the towing chain.

35 Since the trucks are not only conveyed in  
 the horizontal direction but are also moved  
 over inclined conveyance sections, and further  
 are sent over, through switch arrangements,  
 not only conveyor loops but also side sections,  
 40 coupling devices have been developed corre-  
 sponding to the actual problem set, thus for  
 example, equipped with release levers, locking  
 levers or the like which will be effective with  
 or in addition to the entrainment finger proper.

45 In the known coupling devices of this kind  
 the entrainment means on the towing chain  
 are equipped with one or more downwardly  
 projecting fingers or levers, which if necessary  
 with the interpolation of a further lever, can  
 be locked in their vertical position and thus  
 in co-operation with the entrainment parts on  
 the trucks transmit to these trucks the advance

50 of the towing chain. Under certain conditions  
 and through suitable action from outside these  
 entrainment fingers or the like can be pivoted  
 from their vertical position, so that they can  
 slide over the appropriate entrainment parts  
 55 of the trucks and thus the connection trans-  
 mitting the conveyance between towing chain  
 and truck is interrupted. The known entrain-  
 ment fingers or the like are collectively and  
 individually so constructed, mounted and  
 60 controlled that it is not possible to move a  
 truck more rapidly than the chain circulates,  
 thus as if to overtake one or more entrainment  
 means of the towing chain. This is opposed  
 by the entrainment fingers locked in their  
 65 vertical positions. In practice, in which such  
 endless towing conveyors are introduced, the  
 requirement often exists however, from any  
 occurrences, in disturbances, or the like, to  
 be able to move one or more trucks, more  
 70 rapidly than the towing chain, on the running  
 rails in the conveyance direction.

75 Deviating from the hitherto known prob-  
 lems posed and the solutions adapted to these,  
 the present invention is based on the problem  
 of so constructing the coupling device that  
 the trucks can be pushed through for example  
 by hand such as during overtaking under one  
 or more coupling devices located before the  
 trucks in the conveyance direction. This is  
 not possible in the known coupling devices,  
 80 since here the entrainment finger in its down-  
 wardly directed and locked position would  
 present an obstacle.

85 According to the present invention there is  
 provided coupling means for coupling trucks  
 to towing means of an endless towing con-  
 veyor in which trucks run on suitable rails  
 arranged laterally to the towing means, the  
 coupling means including entrainment means  
 arranged on the towing means with parts ex-  
 tending into the conveyance path of the trucks  
 or parts thereof, wherein an entrainment finger  
 is arranged pivotable in both the conveyance  
 direction and the opposite direction thereto  
 about an axis extending transversely to the  
 conveyance direction, said entrainment finger

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being lockable in its entraining position against pivoting in said opposite direction by engagement with a pawl.

The pawl is preferably disengageable by 5 means of a release lever acting thereon. In effect, the coupling device is so constructed that the entrainment finger can swing away as a result of a truck being pushed through. In addition however the good kinematics in 10 15 the co-operation of the entrainment finger and the remaining moved parts of the coupling devices as in the known devices of this kind should remain maintained.

In preferred embodiments of the invention 15 a coupling device for endless towing conveyors with rail tracks arranged alongside the towing chain for trucks equipped with two running means rolling on these tracks, has the moving coupling parts arranged on the entrainment means of the towing chain and coupling parts co-operating therewith are provided on the trucks, wherein further the coupling parts arranged on the entrainment means of the towing chain in detail consist of 20 25 a casing, in which an entrainment finger and a locking pawl operatively connected therewith and pivotable about a horizontal axis are mounted, and a release lever pivotable about a horizontal axis in the entrainment means of the towing chain is provided, such, that the locking pawl 30 can be swung away upwardly about its pivoted axis out of its operative position locking the entrainment finger in the entrainment position and its lower position is defined by a pin or the like.

In the following description one embodiment of the invention illustrated purely schematically in the accompanying drawings by way of example is explained in detail.

40 Figure 1 shows a coupling device with a portion of an endless towing conveyor in side elevation, in

45 Figure 2 the same portion is reproduced in plan view

Figure 3 is a section along the line III—III of Figure 2 and

50 Figure 4 shows finally the details of the coupling device, again in side elevation, on an enlarged scale.

55 Entrainment means 2 are arranged at uniform spacings on a towing chain 1. An upper running rail 3 and a lower running rail 4 are provided running parallel with the towing means in the form of chain 1, on which rails run the rollers 5 and 6 of the trucks 7. In the embodiment illustrated the rollers 5 are provided with an inclined axis and run in an angularly shaped upper running rail 3, while the rollers 6 are supported with vertical axes laterally on the lower running rail 4.

60 The trucks 7 are equipped with two running means, a forward running means 8 and a rear running means 9, which carry the said rollers 5 and 6. The forward running

means 8 of the truck 7 is equipped with an entrainment lug 10, and the rear running means 9 with an uncoupling lug 11.

The entrainment lug 10 and the uncoupling lug 11 co-operate with the downwardly projecting parts, described in more detail below, of the entrainment means 2 on the towing chain 1. The conveyance direction is indicated by the arrow 12 in Figure 1. In addition to the entrainment devices on the trucks, stationary uncoupling devices 13 are provided at appropriate positions of the towing system, which effect the uncoupling of the entrainment parts on the towing chain from the entrainment lug on the trucks and stop the trucks. The towing chain is guided in a chain guide rail 14.

70 Suitable means are provided for releasing the entrainment fingers from their vertical locked entrainment position, so that they can pivot in the direction opposite to the conveyance direction as well as in the conveyance direction under the action of an entrainment lug or uncoupling lug.

75 80 85 90 95 In the entrainment casing 21 fixed on the towing chain 1 is an entrainment finger 23 which can swing about a horizontal pivot 22 extending transversely to the conveyance direction, which finger can be locked by a locking pawl 24 in its vertical entrainment position. This locking pawl 24 is also pivotable about a horizontal pivot 25 and is secured in its horizontal position locking the entrainment fingers 23 by a pin 26. Here it is supported with its front face 27 against the upper region 28 of the facing side of the entrainment finger 23 and locks this in its vertical entrainment position. Furthermore a release lever is provided which also is pivotable about a horizontal pivot 30. Under external action, for example through running over an uncoupling device 13, the release lever 29 is pivoted from its vertical position and according to the pivoting direction, lifts the locking pawl 24 by means of a cam 32 or a rounding 33, so that this frees the entrainment finger 23.

100 105 110 115 120 The arrangement and suspension of the entrainment finger 23 in the entrainment means casing 21 is now so affected that this, without being hindered by the locking pawl or other parts of or in the entrainment casing, also under the action, for example, of an entrainment lug 10 on the forward running means 8 of a truck 7 can be pivoted forwardly so that the entrainment lug 10 and accordingly the truck can run under and overhaul the entrainment device on the towing chain 1.

125 As shown in Figure 4 the entrainment means casing 21 is secured with a resilient entrainment means fastener 34 to the towing chain at the provided positions of the towing chain 1.

**WHAT WE CLAIM IS:—**

1. Coupling means for coupling trucks to towing means of an endless towing conveyor in which trucks run on suitable rails arranged laterally to the towing means, the coupling means including entrainment means arranged on the towing means with parts extending into the conveyance path of the trucks or parts thereof, wherein an entrainment finger is arranged pivotable in both the conveyance direction and the opposite direction thereto about an axis extending transversely to the conveyance direction, said entrainment finger being lockable in its entraining position against pivoting in said opposite direction by engagement with a pawl. 25

10 2. Coupling means as claimed in claim 1, wherein the pawl is operable to lock the entrainment finger in its entrainment position to extend vertically from an entrainment means casing on the towing means.

15 3. Coupling means as claimed in claim 1 30

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or 2, wherein the entrainment finger comprises a lever, one arm thereof comprising the said part extending into the conveyance path and the other arm thereof being engageable by said pawl to lock the finger.

4. Coupling means as claimed in claim 1 or 2 or 3, wherein the pawl is disengageable by means of a release lever acting thereon.

5. Coupling means as claimed in claim 4, wherein the pawl is gravity biased into the locking position and supported therein by a pin.

6. A coupling device substantially as described herein with reference to and as shown in the accompanying drawings.

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## COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale  
Sheet 1

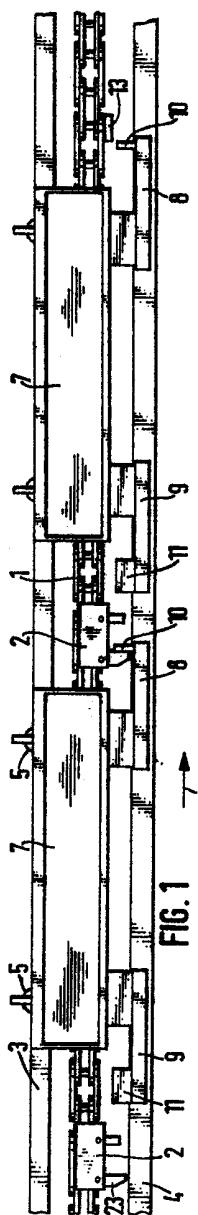


FIG. 1

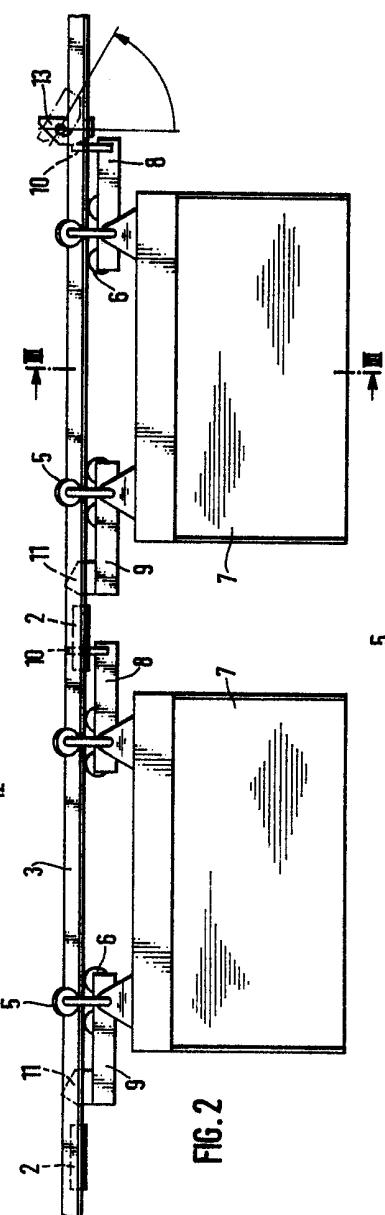


FIG. 2

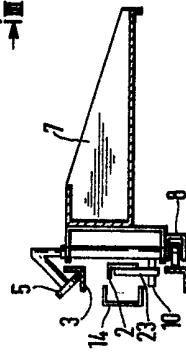


FIG. 3

