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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
in and by the following statement:—

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
by the towing chain and also release of the
trucks from the towing chain.

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
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.

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,
coupling devices have been developed cor-
responding 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.

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

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
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
controlled that it is not possible to move a
truck more rapidly than the chain circulates,
thus as if to overhaul one or more entrainment
means of the towing chain. This is opposed
by the entrainment fingers locked in their
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
rapidly than the towing chain, on the running
rails in the conveyance direction.

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,
since here the entrainment finger in its down-
wardly directed and locked position would
present an obstacle.

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.

5 The pawl is preferably disengageable by 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 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.

10 In preferred embodiments of the invention 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 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 casing is provided, such, that the locking pawl 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.

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

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

Figure 2 the same portion is reproduced in plan view

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

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

30 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.

35 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.

40 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.

45 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.

50 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.

55 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.

60 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.
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.
3. Coupling means as claimed in claim 1

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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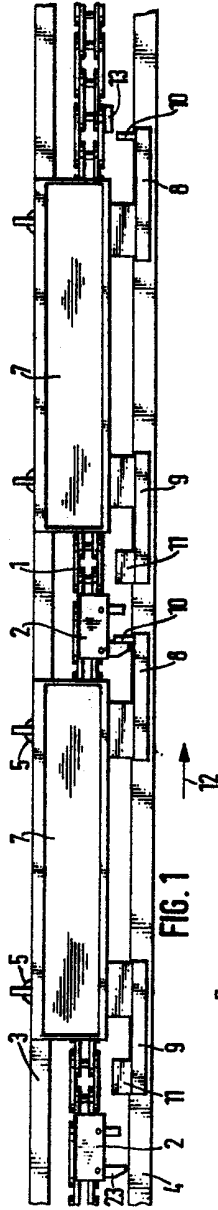


FIG. 1

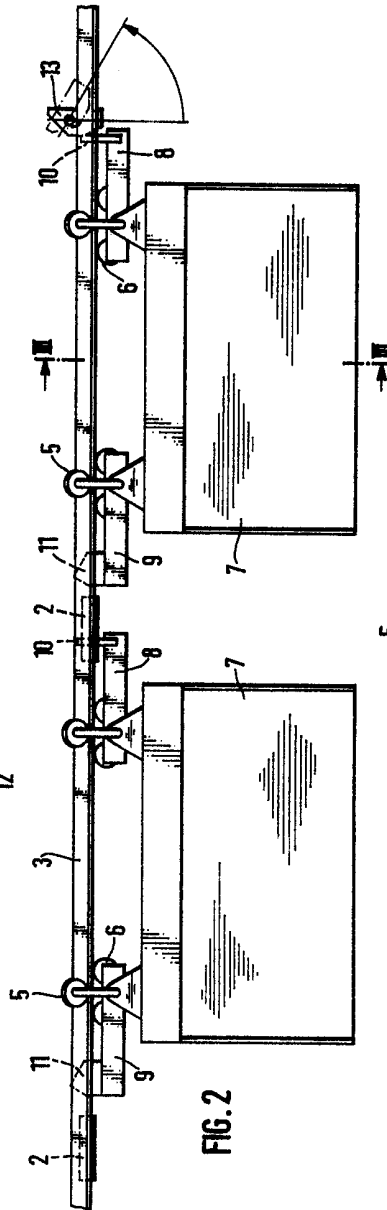


FIG. 2

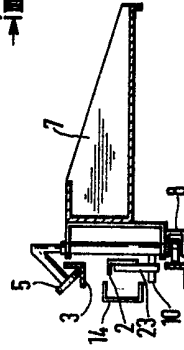


FIG. 3

