

No. 733,257.

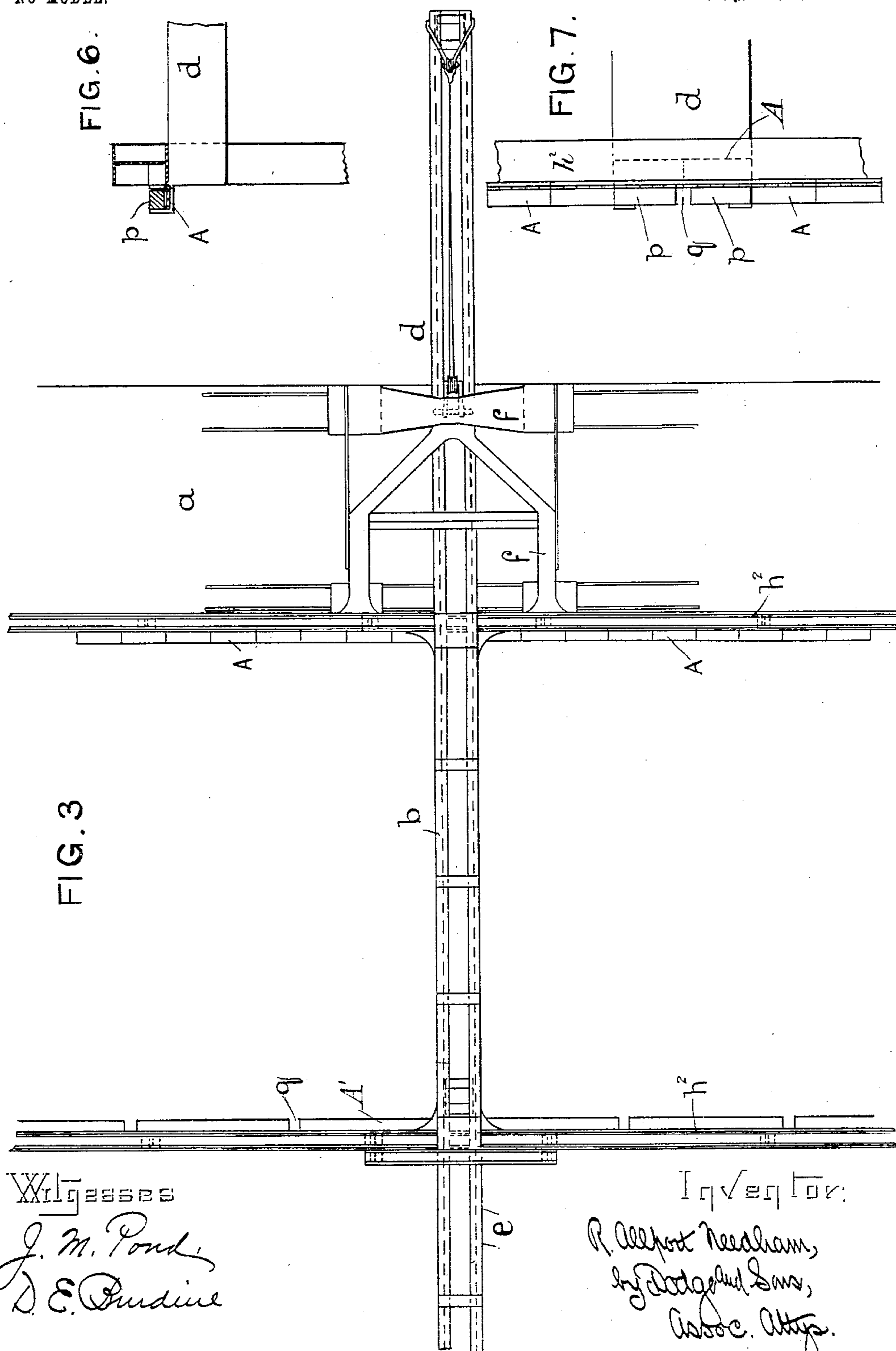
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APPARATUS FOR TRANSPORTING LOADS.

APPLICATION FILED JUNE 3, 1901.

NO MODEL.

3 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

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APPARATUS FOR TRANSPORTING LOADS.

SPECIFICATION forming part of Letters Patent No. 733,257, dated July 7, 1903.

Application filed June 3, 1901. Serial No. 62,958. (No model.)

To all whom it may concern:

Be it known that I, RONALD ALLPORT NEEDHAM, mechanical engineer, a subject of the King of Great Britain, residing at Acrefield House, Woolton, near Liverpool, in the county of Lancaster, England, have invented certain new and useful Improvements in Apparatus for Transporting Loads, (for which application for a patent has been made in Great Britain, No. 22,007, dated December 4, 1900,) of which the following is a specification.

This invention relates to an apparatus for transporting cargo or other loads from the holds of ships or other places; and it consists in providing one or more arms projecting over the ship's hold or the like, each provided with rail-tracks upon which a traveler supporting the load may be run, and a gauntree or traveling crane mounted upon rails on the quay, preferably in a warehouse or shed, onto which gauntreesaid traveler carrying the load may be run from said arm, which gauntree while supporting the traveler may be moved longitudinally in such shed or warehouse to any desired place therein or may be brought into line with an elevated railway or track, any number of which railways may be provided at the side of the shed away from the quay-wall along which track the traveler carrying the load may be run to a warehouse or any desired discharging-place.

In the accompanying drawings, Figure 1 is a side elevation of the apparatus as applied to unloading ships, showing an elevated rail-track *e*, a gauntree *b*, and an arm *d*, supported by its framework or column and projecting over the quay-wall *a*; Fig. 2, an end view of the arm *d* and its supporting-column; Fig. 3, a plan of Fig. 1; Fig. 4, a view of the gauntree or traveling crane with one side removed; Fig. 5, a plan of said gauntree; Figs. 6 and 7, cross-section and plan, respectively, of a means for locking the gauntree in position in line with a movable arm *d*; and Figs. 8 and 9 are elevation and plan view, respectively, of the locking-stop and the slot in which it may engage.

Referring to the drawings, *a* is the dock, wall, or quay alongside which the ship is loaded or unloaded.

b is a gauntree or traveling crane mounted upon wheels *h'*, adapted to run on rails *i*,

supported by elevated beams *h*² on the quay, preferably within a shed or warehouse.

c is a traveler or carriage provided with a crab for raising and carrying loads *w*.

d is an arm provided with rails along which the traveler may be run to bring it in position over the hold of a ship or the like, and on the side away from the quay of the rail-track along which the gauntree travels is an elevated railway *e*, (or any desired number of such railways,) along which when the gauntree *b* is brought into line therewith the traveler *c* may be run, each of which railways may be extended in a straight line or in a curve, as required, to any warehouse, railway-line, or roadway for vehicles to which it is desired to convey the goods. By this arrangement heavy loads can be lifted out of the hold of a vessel or the like by means of the crab on the traveler *c*. The traveler supporting the load *w* may be run along the arm *d* onto the gauntree *b*, which can then be moved along its railway *i* to any desired position in the shed or on the quay, or if the gauntree is brought into line with an elevated rail-track *e* the traveler *c* may be run out from the gauntree along this track to another warehouse, railway, or the like, as required. In a similar manner goods from other warehouses or a railway with which an elevated rail-track *e* is in communication can be lifted by the crab of the traveler *c*, and the traveler may be then run along the elevated railway *e* into the gauntree *b* and across the gauntree along the arm *d* (if the railway *e* is in line with the arm *d*) to a position over the hold of a ship or the like, into which the load may then be lowered, or if the railway *e* and the arm *d* are not in line the gauntree *b*, with the traveler *c*, may be moved along the shed until the gauntree is in line with the arm *d* or is in any desired position for discharging the load.

The arm *d*, which extends from the shed over the side of the quay, may be pivotally mounted by supports *g* upon a vertical frame or column *f*, so that the arm *d* may be either allowed to stand horizontally over the quay side for the purpose of unloading a ship or the like, as shown in Fig. 1, or may be raised into an approximately vertical position, as shown in dotted lines in Fig. 1, by means of a tackle, such as *h*, so as to allow of a ship

being moved at the quay side without obstruction or to facilitate the movement of the frame or column *f* along its track on the quay-wall when it is desired to change the position of the arm *d*. This movement may be effected by any suitable means, either by a hand-operated winch, by an engine, or by horsepower or the like, the frame *f* running on its rollers *j* on the track on the quay. More than one such column *f*, carrying an arm *d*, may be arranged on the quay-wall, and additional gauntrees and travelers may be provided, so that goods may be loaded and unloaded from two or more holds at the same time, if required.

The arm *d* is extended so as to engage under the beam *h*² nearest the quay side and is provided with a pair of blocks or stops *p* on the end which extends beyond the beam, between which blocks a space *q* is left. On the said beam *h*² are mounted a number of bar-sections *A*, each attached to the beam by a spring-hinge, which always tends to hold its bar-section in a horizontal position projecting beyond the beam *h*². When the arm *d* is brought into position and engaged with this beam *h*², the blocks *p* on the end of the arm *d* force back those sections which are in front of the arm *d* until they lie in the position shown in Fig. 6 and in dotted lines in Fig. 7—that is to say, turned back into the angle of the beam *h*². The space *q* is thus left open for the interlocking stop *o* on the gauntree to engage therein in the manner hereinafter described. On the opposite beam *h*² is a fixed bar *A'*, provided with slots corresponding to *q* opposite to each elevated rail-track *e*.

When it is desired to move the frame *f* along the quay, the outer end of the arm *d* is slightly raised until the blocks *p* on the inner end thereof are clear of the bar-sections *A*. The frame, with the arm *d*, is then moved to the required position along the quay side, and the arm *d* is again adjusted so that its inner end engages the under side of the beam *h*², and the blocks *p* on said arm *d* force backward the bar-sections *A* which are above them in the new position, so that an open slot is left at *q*, in which the stop *o* may engage in the manner hereinafter described.

In a modification the arms *d* are stationary, and one or more of them are provided in the best positions along the quay side. In this case the hinged section-bars *A* are dispensed with and are replaced by a bar, such as *A'*, which is only slotted at the points opposite to the end of each arm *d*. In any case, however, it will be seen that there is always a slot *q* in the bar opposite the end of each rail-track *e* or arm *d*, in which slots the stops *o* may engage.

The gauntree *b*, as shown in Figs. 4 and 5, is provided with a pair of double-armed levers *s t*, each pivoted upon a cross-piece *r*. A slide *m* is mounted in guides *n* upon each end of the gauntree, the lower end of each of said slides being provided with a shoulder *o*, in

which a small roller is mounted, as shown in Figs. 4, 8, and 9.

Each slide *m* is connected by means of a projecting lug with the end of one of the lever-arms *s*, so that when the other arm *t* of said lever is raised the arm *s* and the shoulder or stop *o* on the end thereof are caused to fall. The arms *t* are either counterweighted; or springs, such as *y*, are provided, engaging with arms *x*, connected to the levers *s t*, or other means is provided the tendency of which is to cause the arms *s* and the stops *o* to rise. Rollers *u* are provided on the ends of the arms *t*, which rollers are adapted to run on the top of the traveler *c* when the latter passes beneath them, the traveler then raising the arms *t* and causing the arms *s*, and consequently the stops *o*, to fall.

The action of this device is as follows: Supposing the gauntree *b* to be in the position shown in Fig. 3 opposite the ends of both the railway *e* and the arm *d*, the stops *o* will be in position under the slots *q* at the end of each of said tracks, and if the traveler *c* is not in such a position as to raise one or other, or both, of the arms *t* the stops *o* will engage in the slots *q*. Then wherever the traveler *c* may be, either in an arm *d* or on one of the railways *e*, the gauntree cannot be moved, because the stops *o* are in engagement with the slots *q*. When the traveler *c* is in the center of the gauntree, both the arms *t* are raised, the rollers *u* bearing upon the top of the traveler, and consequently the stops *o* are lowered clear of the slots, so that the gauntree can then be moved along its rail-track to any desired position. If the gauntree be stopped in a position not opposite to either an arm *d* or a track *e* and the carriage *c* be run along the gauntree, so as to leave the rollers *u* and arms *t* free, the stops *o* are caused to rise by the action of the springs *y*, counterweights, or the like until the rollers in said stops encounter the under sides of the bars *A A'*, when they can rise no farther. The stops *o* then project downward, so as to form stops at each end to prevent the traveler *c* from leaving the gauntree, and if the latter be moved along with the traveler *c* not in the center thereof the rollers on the stops *o* run on the under sides of the bars *A A'* until one or both of them reach slots *q*, into which they rise, and thus stop the gauntree in position opposite an arm *d*, a track *e*, or both, as the case may be. If the gauntree be stopped with only one end opposite such a track and only one stop *o* consequently in engagement, the stop at the other end prevents the traveler *c* from passing out at that end and it is only possible for it to leave the gauntree at the end at which the stop is in engagement with a slot *q*. This arrangement of stops and slots consequently insures that the gauntree cannot be moved when the traveler is not in it, that the traveler cannot overrun the end of the gauntree when the latter is not opposite a track *d* or *e*, and that the gauntree shall be exactly in

correct line with said track and the rails on each in line with one another before the traveler can pass from one to the other. A lever *v*, adapted to be operated by hand, is also mounted on each lever *s t* at its pivot-point, which hand-levers may be used on special occasions when the gauntree is to be moved for some reason without the carriage being in position therein.

10 If it is preferred, the arms *t* may be dispensed with and the unlocking of the stops *o* from the slots *q* may be effected by hand, the springs, counterweights, or the like always insuring the engagement of the stops unless the latter are lowered clear of their slots by hand.

I declare that what I claim is—

1. In an apparatus for transporting loads, the combination of a gauntree adapted to travel on a pair of elevated rail-tracks and itself provided with a rail-track, elevated railways extending laterally from the gauntree-track, a traveler adapted to run on the rail-tracks on said gauntree and said elevated railways, bars mounted on the beams which carry the gauntree-tracks, a slot in the bar on said gauntree-track opposite the end of each elevated railway, and stops mounted on said gauntree and adapted to engage in said slots, whereby the gauntree is prevented from being moved away from an elevated railway when the traveler is on such railway, substantially as described.

2. In an apparatus for transporting loads, the combination of a gauntree adapted to travel on a pair of elevated rail-tracks and itself provided with a rail-track, elevated railways extending laterally from the gauntree-track, a traveler adapted to run on the rail-tracks on said gauntree and said elevated railways, a slot opposite the end of each elevated railway, and a stop on each end of said gauntree adapted to project into the path of the traveler when not in engagement with one of said slots, whereby the traveler is prevented from overrunning the end of the gauntree when the latter is not in line with an elevated railway.

3. In an apparatus for transporting loads, the combination of a pair of elevated horizontal beams, a rail on each of said beams, a gauntree adapted to travel on said rails and itself provided with a rail-track, elevated railways connected to said beams, a traveler

adapted to run on the rails on said gauntree and said elevated railways, a stop on each end of said gauntree, means for causing said stops to tend to rise upward, bars on said elevated beams adapted to prevent the rise of said stops, and slots in said bars opposite the ends of said elevated railways whereby the stops are permitted to rise when the gauntree is in line with such railway to lock it in position at the end of said railway, substantially as and for the purpose set forth.

4. In an apparatus for transporting loads, the combination of a gauntree provided with a rail-track, railways with which the rail-track on said gauntree is adapted to be brought into line, a traveler adapted to run on the rails on said gauntree and said railways, a stop mounted in guides on each end of said gauntree, means for causing said stops to tend to rise, bars adapted to project into the path of said stops, a slot in said bars opposite the end of each railway aforesaid in which slots said stops are adapted to engage, a pivoted lever connected with each of said stops, and a roller on one arm of each of said levers adapted to project into the path of said traveler, whereby when the traveler is in the center of the track on the gauntree the stops are lowered clear of said slots to liberate the gauntree, and to permit it to be moved to any required position.

5. In an apparatus for transporting loads, the combination of a pair of elevated horizontal beams, a plurality of bar-sections attached to one of said beams by means of spring-hinges, a rail on each of said beams, a gauntree adapted to travel on said rails, a movable standard, an arm supported by said standard, a traveler adapted to run on rails on said gauntree and said arm, a pair of blocks on the inner end of said arm adapted to replace such of said bar-sections as lie in front of said arm, a space between said blocks, and a stop on said gauntree adapted to engage in said space, whereby the gauntree may be locked in line with said arm substantially as and for the purpose set forth.

In witness whereof I have hereunto signed my name, this 24th day of May, 1901, in the presence of two subscribing witnesses.

R. ALLPORT NEEDHAM.

Witnesses:

G. C. DYMOND,
ALBERT C. B. HENRI.