ABSTRACT: A wheel receiving and clamping track includes a fixed rail and a juxtaposed clamping rail which is movable laterally toward and away from the fixed rail. Elongated actuating members are slideable transversely of the track and engage the clamping rail at longitudinally spaced points. Two sets of pulleys are mounted at fixed points on the side of the fixed rail opposite from the clamping rail and two actuating cables pass over the respective sets of pulleys and through eyes in the actuating members so that when one of the cables is tightened the actuating members draw the clamping rail toward the fixed rail while tightening of the other cable releases the clamping rail.
DEVICES FOR SHIPBOARD FASTENING OF ROLLING MATERIAL

This invention relates to devices for shipboard fastening of rolling material.

It has recently become normal practice to drive passenger cars and freight loaded trailers readily on board ships and therefrom. This makes it possible to dispatch the berth times in port compared to the formerly usual method of working whereby the cargo had to be loaded and unloaded by hoisting installations. By dispatching the harbor times more sailing time is made available and the economic efficiency of the ships is highly improved. Many modern seagoing ships are particularly equipped for the transport of riding cargo. The deck holds are arranged in a particular way and remain unobstructed as much as possible to allow for stowing the riding cargo which is driven on and from board along riding ways extended between the ship and the shore, on the various deck levels as favorably as possible at all times.

It is in view of this aim at shorter berth times and a higher efficiency in general desirable to also reduce the time spent for stowing the cargo in the holds to a minimum as much as possible. The shipboard fastening of the vehicle thus far takes place by lashing said vehicles on deck by means of lashing lines being secured to the ship structure in fixed points of support. To that effect per vehicle a number of operations are required since usually each vehicle is fastened at its four corners by a lashing. Much time is lost thereby. Another drawback of the usual method is that the many lines lying on deck and points of support scattered over the deck, comprising eyelets welded on deck for instance, are serious obstructions in the holds.

The present invention is particularly adapted to substantially reduce the required number of operations for the shipboard fastening of the vehicles and presents the opportunity to better maintain the free unobstructed character of the holds. The object is to provide for the shipboard fastening in all simultaneously by a single operation or action of a plurality of vehicles arranged in one row. To that effect the vehicles after being driven in a row in a wheel track with the wheels that are at one of their both sides have said wheels clamped in said track. According to the invention the device for the shipboard fastening of the vehicles comprises a wheel clamp track having at least one stationary track rail and one oppressing elongated lengthwise extending clamp shape being adapted to be oppressed at the underside of the wheels laterally thereagainst. This provides for the shipboard fastening of an entire row of cars or trailers in one time.

The invention is described more in detail in the following with reference to the illustrative embodiments in the accompanying drawings.

FIG. 1 shows an embodiment of a wheel clamp track according to the invention in plan view;
FIG. 2 is a cross-sectional view of a wheel clamp track taken along line II–II of Figure 1;
FIG. 3 is a sectional view of another embodiment of a clamp shape.

In the drawings a wheel clamp track provided in a hold to be stowed with riding cargo on a deck 1 is generally indicated by the reference number 2. A wheel clamp track 2 in most cases generally comprises a stationary track 3 and one oppressing clamp shape 4, as indicated in FIGS. 1 and 2, or two stationary track rails 3 and two clamp shapes 4, as shown in FIGS. 4 through 7. The wheels 5 of the vehicles, which are driven in the wheel clamp track 2, preferably move over a doubling 6 forming part of the wheel clamp track 2 as a base plate and bearing closely abutting on the deck 1, as indicated in FIG. 2.

The oppression at the underside of the wheels laterally thereagainst of a clamp shape 4 can be effected purely mechanically e.g. by means of the device illustrated in FIGS. 1 and 2. It is observed that although the new system 2 as hereinafter described is adapted for the seizing of automobiles and the like which are stowed in the hold of a ship, this is only intended by way of example for illustrative purposes, since the system can be applied just as well for the fastening of vehicles in a railroad wagon, an airplane or any other transport means.

A first stationary track rail 3 which may have a height of about to 6 inches, is mounted in a hold of a ship parallel to one of the board sides on the deck 1 at a distance of e.g. 40

In accordance with the number of vehicle rows to be stowed further wheel clamp tracks 2 are divided over the hold mounted on the deck 1 parallel to the first wheel clamp track 2. The loose opposite rail represents in the embodiment of FIGS. 1 and 2 the oppressing clamp shape 4 of the wheel clamp track 2. The loose rail may comprise a rubber shape of the required dimensions, behind which force exerting means in the form of sliding hooks 7 are engaging, in order to be able to press the shape 4 at the underside of the wheels 5 laterally thereagainst. The hooks 7 are slidable in the baseplate 6 and countersunk or recessed therein, in order to provide a flat riding-strip; and project beyond the stationary track rail 3 to terminate at the opposite side thereof, where at the hook ends blocks or eyelets 8 and 9 through which tackles 10 and 11 respectively are passed, are provided which serve for pulling fast and disengaging respectively of the sliding hooks 7. In the tackle 10 serving for pulling fast the hooks 7 rather great forces can be produced. For said tackle 10 therefore a rather heavy cable 12 is used and the forces exerted thereby must be operative at a steep angle as favorable as possible, which is obtained by mounting the tackle blocks 13 on the track rail 3 or brackets 14 on the deck 1, as best shown in FIG. 1. For the tackle 11 a lighter line may be used and the stationary blocks 16, over which these are reeved, have not to be placed far off from the rail 3 since the forces for disengaging the sliding hooks 7 and the clamp shape 4 from the wheels 5 in order to make free the track 2 and to permit to drive the vehicles out of it, are as a matter of course only small.

The clamp shape 4 is laterally oppressed by the force exerting means 7 spaced over the length thereof, said force exerting means being acted upon in the described way by the tackles 10 and 11, mounted at the height of the riding floor and extending lengthwise along the wheel clamp track 2. The entire tackle system 10 through 16 can be concealed from view by means of a screening serving as a floor plate of a gangway and therefore does not have to form an obstruction in the hold. The heavy tackle 10 can be operated by a winch or also by means of a screw of rack mechanism.

It is the intention that the sliding hooks will come before and behind a vehicle with the blocks 13 being then in the middle along the vehicle, and a clamp shape 4 taking lengthwise such a curved form that the vehicle cannot pull out in that direction either.

The clamp shape 4 often consists of flexible material such as rubber and can be fitted out with a steel core for reinforcement. The stationary track rail 3 comprises e.g. a steel structure provided with an elastic buffer rim in order to protect the tires of the vehicles. The steel structure is mostly hollow, so that a fire extinguishing conduit could be accommodated therein if desired, from which in case of fire e.g. a bed of foam could be sprayed below the vehicles to extinguish the fire, or at least to prevent a further explosion.

In FIG. 3 a clamp shape 4 is shown having such a cross section that by the oppressing a downwardly directed force component is provided, whereby the wheels 5 are firmly pressed down in the wheel track 2.

The width of the clamp track 2, that is the distance between the stationary track rail 3 and the clamp shape 4 in FIGS. 1 and 2, should be equal to about two times the tire breadth of a large passenger car. In order to facilitate the riding into it the wheel clamp track 2 is constructed with a guiding bevel at the ends at 18, as shown in FIG. 1.

The system illustrated in FIGS. 1 and 2 works purely mechanically as shown, but it could also e.g. be hydraulically operated, whereby the stationary track rail 3 have to be arranged as hydraulic conduits or for receiving hydraulic conduits, and the sliding hooks 7 can then be actuated by separate
rams. The required pressure could be provided by moving a piston which is movable in the hydraulic main conduit by a heavy but simple screw or rack mechanism. As is stated before, the pull cable 10 in a purely mechanical system instead of by a winch could also be hauled by means of such a screw or rack mechanism for pushing on the hooks 7.

Summarizing it is seen that the object of the new system is the proper shipboard fastening all simultaneously in one time of a row of cars and to do this without exposing the vehicles and tires to any risk of damage.

What I claim is:

1. A wheel clamping device for securing the wheels of vehicles on a supporting surface, said device comprising a wheel receiving and clamping track including a fixed rail and a juxtaposed clamping rail movable laterally toward and away from said fixed rail, and means for actuating said clamping rail, said actuating means including a set of elongated actuating members extending slidably transversely through said track and having one end thereof in operative engagement with said clamping rail at points spaced longitudinally of the latter, the other ends of said actuating members projecting to the side of said fixed rail opposite from said clamping rail and being formed with a set of eyes, a set of pulleys mounted at fixed points at said opposite side of the fixed rail in laterally spaced relation therefrom and longitudinally between locations of said actuating members, and an actuating cable passing alternately around said pulleys and through the eyes in the actuating members whereby the latter may be slid in a direction to draw said clamping rail toward the fixed rail when said cable is tightened.

2. The device as defined in claim 1 wherein said actuating means also include a second set of pulleys mounted at fixed points at said opposite side of the fixed rail in transverse alignment with the first mentioned pulleys but closer to the fixed rail than the first mentioned pulleys, said actuating members being provided with a second set of eyes, and a second actuating cable passing alternately around the second set of pulleys and through the second set of eyes in the actuating members whereby the latter may be slid in the opposite direction to release said clamping rail when said second cable is tightened.

3. The device as defined in claim 1 wherein said actuating members are provided with hook-shaped extremities in operative engagement with said clamping rail.

4. The device as defined in claim 1 wherein said clamping rail includes a lateral nose portion extending upwardly and laterally toward said fixed rail for exerting lateral and downward force against wheels clamped between the fixed rail and the clamping rail.

5. The device as defined in claim 1 wherein said clamping rail is formed from flexible material.

6. The device as defined in claim 5 wherein said clamping rail comprises a metallic core and an elastomeric covering sheath.