July 21, 1931. E. H. WATTS 1,815,687

CARGO SHIP

Filed Oct. 30, 1929 5 Sheets-Sheet 1

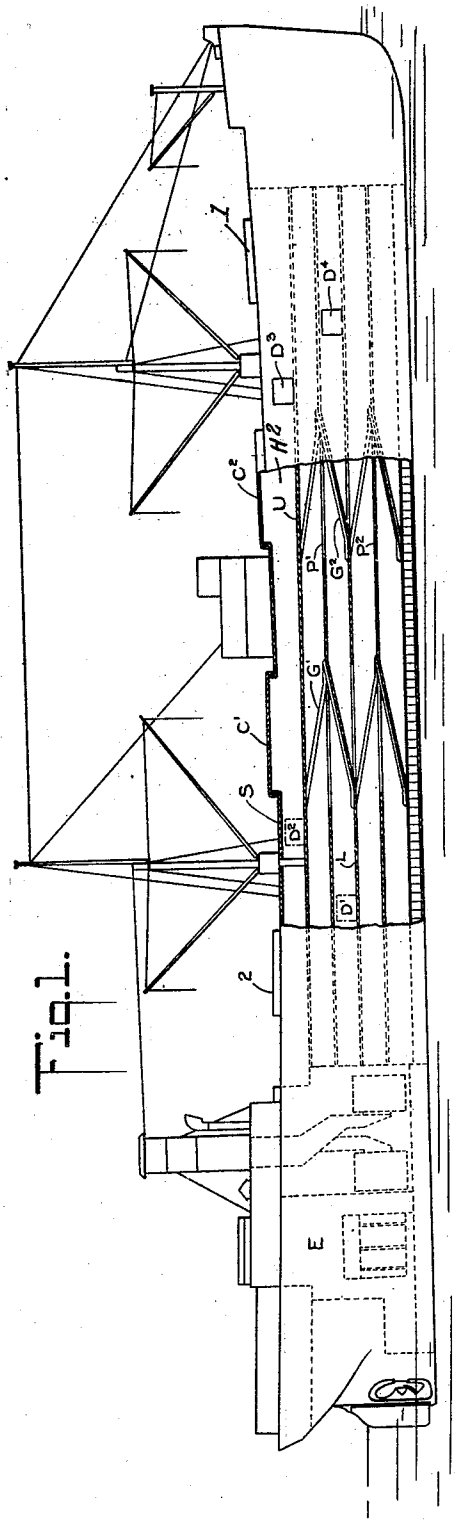



Fig. 1.

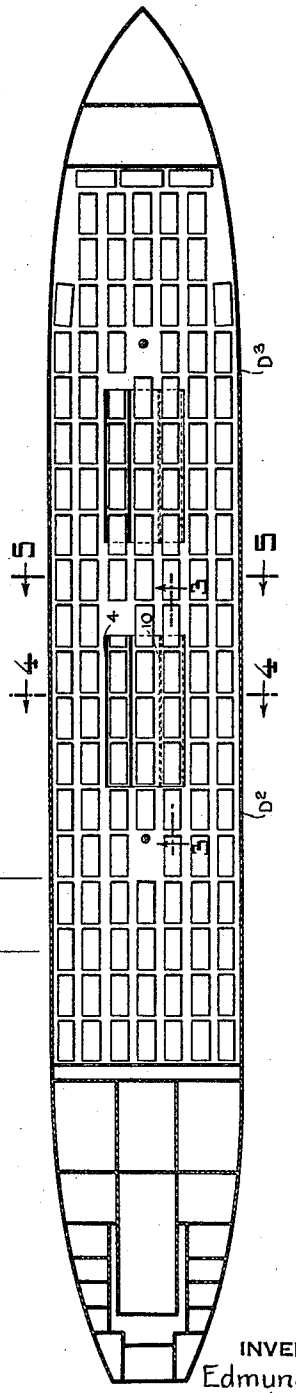



Fig. 2.

INVENTOR
Edmund H. Watts
BY Lucke and Ryan
ATTORNEYS

July 21, 1931. E. H. WATTS 1,815,687

CARGO SHIP

Filed Oct. 30, 1929 5 Sheets-Sheet 2

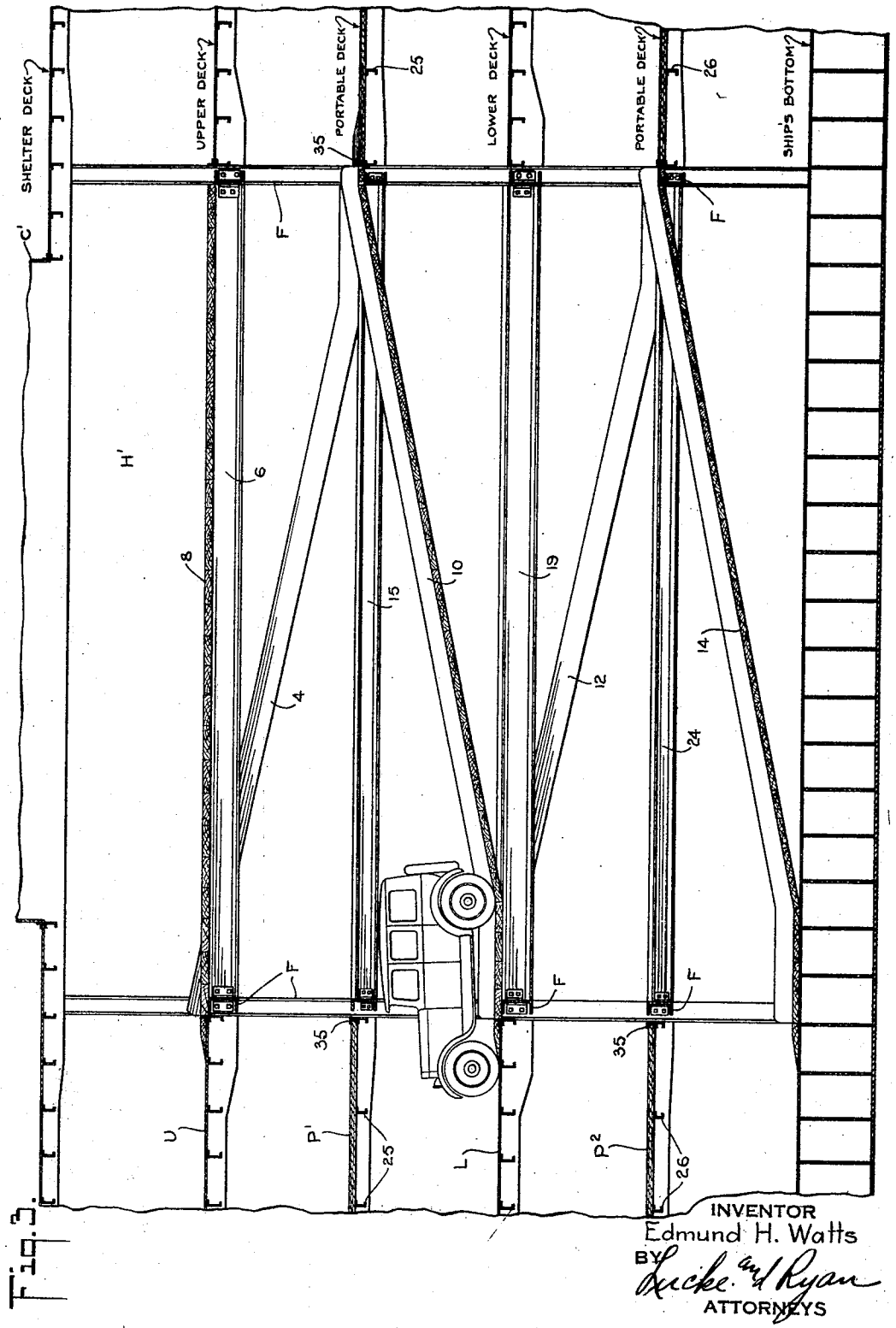



Fig. 2.

INVENTOR
Edmund H. Watts
BY Lucke and Ryan
ATTORNEYS

July 21, 1931. E. H. WATTS 1,815,687

CARGO SHIP

Filed Oct. 30, 1929 5 Sheets-Sheet 3

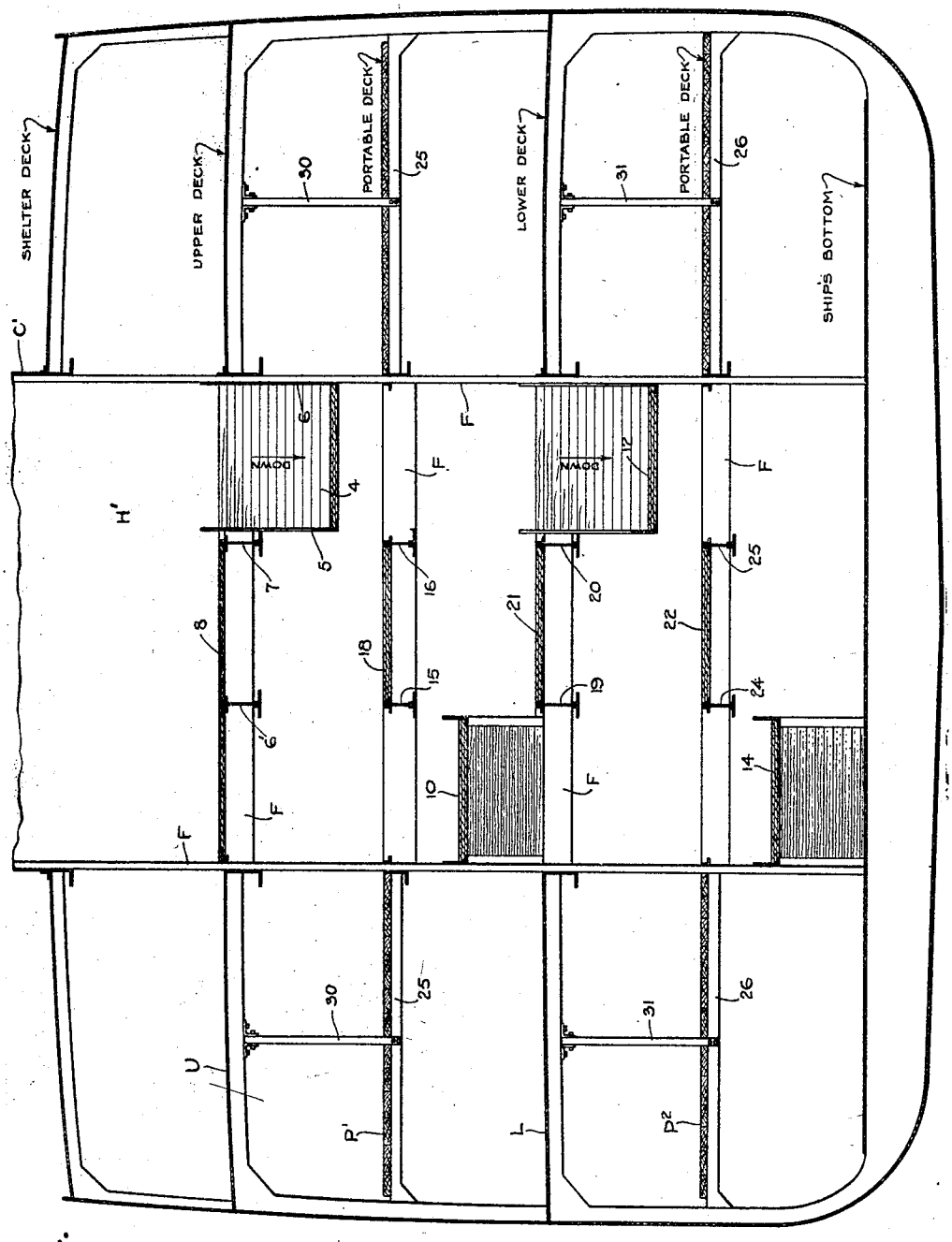



Fig. 4.

INVENTOR
Edmund H. Watts
BY Lucke and Ryan
ATTORNEYS

July 21, 1931. E. H. WATTS 1,815,687

CARGO SHIP

Filed Oct. 30, 1929 5 Sheets-Sheet 4

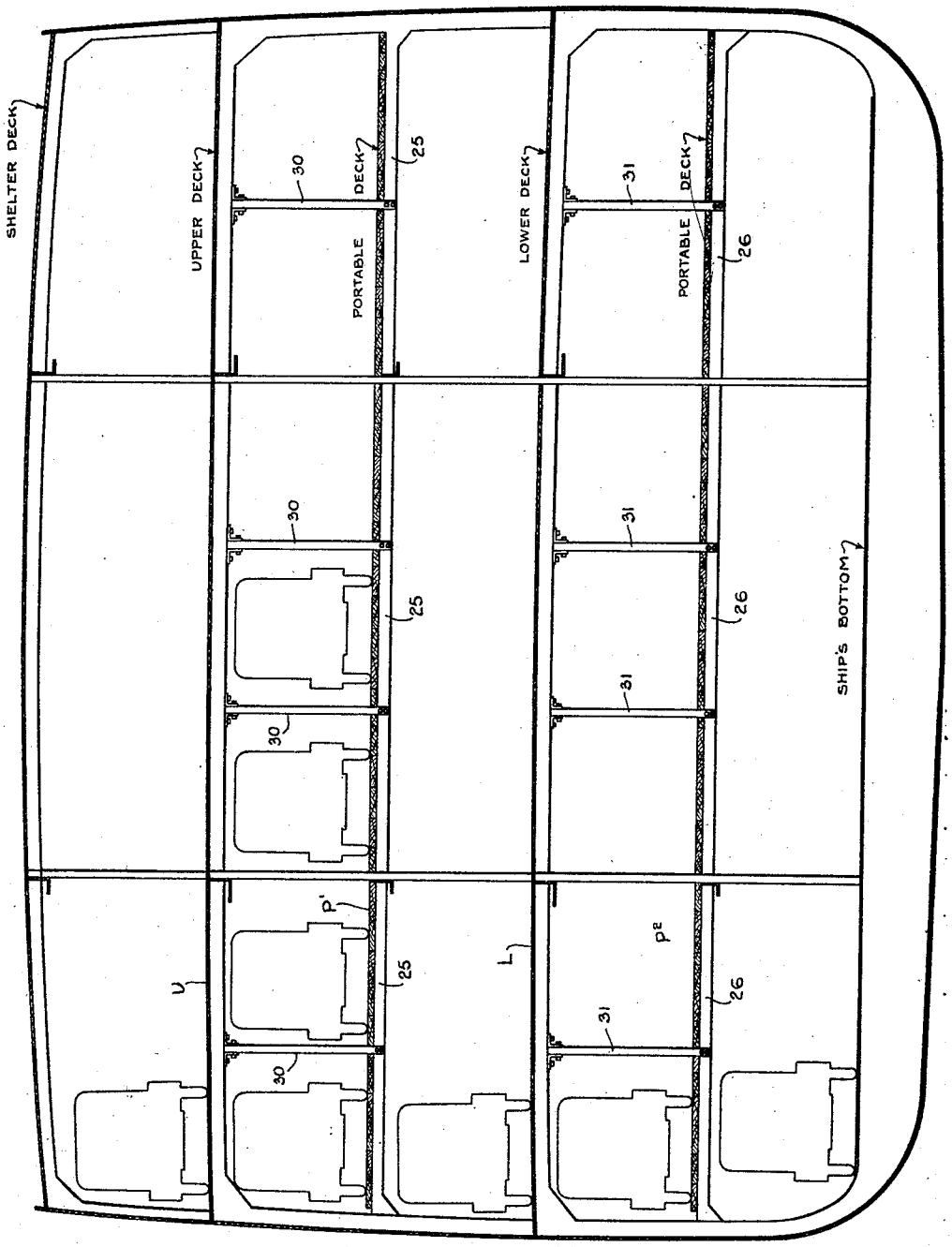



Fig. 5.

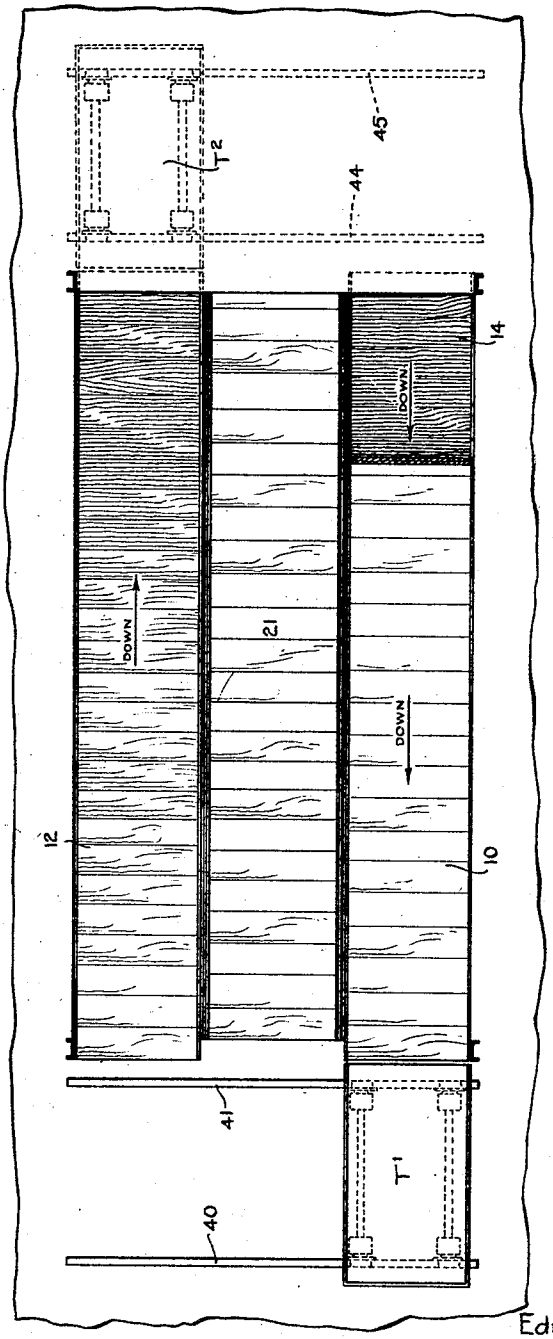
INVENTOR
Edmund H. Watts
BY Lucke and Ryan
ATTORNEYS

July 21, 1931. E. H. WATTS 1,815,687

CARGO SHIP

Filed Oct. 30, 1929 5 Sheets-Sheet 5

Fig. 5.




INVENTOR
Edmund H. Watts
BY Lucke & Ryan
ATTORNEYS

Patented July 21, 1931 1,815,687

# UNITED STATES PATENT OFFICE

EDMUND H. WATTS, OF LONDON, ENGLAND

## CARGO SHIP

Application filed October 30, 1929, Serial No. 403,424, and in Great Britain February 19, 1929.

This invention relates to the construction of ships, more particularly cargo boats, and has for its object an improved ship construction adapted to facilitate the loading and unloading and stowage of wheeled vehicles, especially bulk consignments of new motor vehicles or cars, an aim of the invention being to provide a ship's construction capable of taking a large consignment of vehicles or cars as the whole or main portion of the cargo whilst preserving the capacity of the ship to accept other cargoes, as for example on the return voyage.

A further aim of the invention is to provide arrangements such that the cars or vehicles may be loaded by aid of their own power or wheeled on board and for stowage purposes so that the use of crates and slings are eliminated and handling is reduced to a minimum.

According to the invention the hull (or hull and bulwarks) of the ship is provided with a plurality of gangway doors certain of which open to a lower deck or decks. For loading purposes these doors communicate with gangways or brows leading from the dock, the gangways and doors being of sufficient width to accommodate the maximum size of car or vehicle for which the ship is designed.

The ship is built with one, two or more permanent decks, while intermediate these decks and/or intermediate the lower deck and the ship's bottom, portable or removable decks are provided supported upon permanent or semi-permanent girder or other frameworks. Each deck is formed with a hatchway or plurality of hatchways.

Leading from each or certain of the hatchways and from deck to deck is an inclined gangway or brow arranged at a suitable angle or gradient for the wheeled passage of a car or vehicle.

Each portable or permanent deck below the shelter deck is provided with hatchways or openings to give communication between gangways. According to the preferred arrangement the communicating gangways are located laterally adjacent one another and zig-zag fashion. The permanent and portable decks are built clear so that cars may be run and manœuvred into their stowage position side by side and row by row, suitable means being provided for securing or anchoring the cars to the decks or other fixtures.

According to the preferred design the ship is built with the engine and boiler rooms aft so that the whole of the waist of the ship from the after bulkhead to the fore peak or fore peak hold is available for wheeled cargo.

In carrying the invention into effect according to one convenient mode, by way of example, a ship is built with its engine and boiler rooms aft, as above indicated, and with upper and lower permanent decks designed for car stowage and with a portable deck between the upper and lower deck and between the lower deck and the ship's bottom. The portable deck is carried by beams and cross girders supported upon stanchions, where necessary, so as to form a skeleton framework upon which the portable deck can removably be laid. The stanchion may be detachable or displaceable by hinging to facilitate dismantling the portable decks when the ship is required for other cargoes.

The upper deck is provided with a pair of hatches, one forward and one aft of the midship's position. Each hatch is served by a gangway down or up which cars can be driven or wheeled and arranged at a suitable gradient for this purpose. The portable deck below the upper deck is provided with a hatchway laterally adjacent the gangway from the upper deck, to accommodate a second gangway from the portable deck to the lower deck. The lower deck and the portable deck below it is similarly provided with hatchways and gangways.

The gangways may be arranged laterally adjacent and in zig-zag fashion; for example, assuming the gangway from the upper deck to the first portable deck to be a port gangway, then the gangway from the first portable deck to the lower deck would be a starboard gangway and so forth. According to the preferred arrangement, the gangways are arranged so that a car passing down the first gangway in a forwardly direction would be in

reverse in passing down or would be backed down the second gangway and so on.

If necessary, or to reduce manœuvring of the cars, in conjunction with the head and foot of each gangway a simple form of turntable such as would be capable of displacing a car through a convenient angle or arc, may be employed, or, instead of having a turntable, a platform may be provided capable of being slid or shifting abeam of the ship to transfer a car from the port gangway alignment to the starboard gangway alignment or vice versa.

The gangways may be divided longitudinally or otherwise and provided with cross or supporting beams or other means so that they may be more conveniently dismounted and stowed away when not in use. Alternatively the gangways may be hinged so that they may be raised, lowered and stowed parallel with the deck area.

The hatches are of sufficient extent longitudinally of the vessel to give clearance or head room for the passage of cars or vehicles for which the ship is designed, while transversely the hatchways may be arranged so as to be convenient both for gangway ingress and egress and for loading by derrick or grain chutes when the vessel is employed for cargo or freight other than motor cars. For example, the gangways may be arranged to one side of rectangular hatches and may occupy as little as one-third the transverse width thereof. Alternatively, double or treble gangways may be employed so that two or three cars abreast may use the gangways.

The hull on each side of the vessel may be provided with a plurality of gangway doors for a width and height suitable for giving clearance way for the ingress and egress of the vehicles. These doors may be arranged conveniently adjacent the deck to deck gangways and conveniently disposed to give access to the deck levels from dock gangways or ramps. It is preferred to provide one or more gangway doors on the level of each permanent deck and, if desired, intermediate doors may be provided to give access to the portable decks.

The various decks may be served by a single series of gangways or a plurality of series may be provided. For example, one series may be located aft of the midships position and one forward thereof for use in conjunction with the hatchways above described.

If desired, in addition to the main gangways herein referred to, subsidiary gangways may be provided between one deck and another at different points over the deck area and away from the main gangways in order to facilitate access to various more remote points or localities of the stowage area. When the cars are located in their stowage position they may be secured to the deck or other fixture by the aid of chocks and lashings or by means of mechanical fastenings which may be of the screw or leverage type, adapted to engage the axles, chassis or other part of the car.

In addition to the gangway hatches the various decks may be provided with other or supplementary hatches for use when a cargo or other than motor vehicles was being handled.

It will be appreciated that a ship of the above character is admirably adapted for the loading and stowage of a very large number of cars or motor vehicles which can be loaded under their own power as the arrangement makes it possible for each car to be driven on board and from deck to deck to the exact point of stowage for the particular car. Similarly the cars can be driven or wheeled ashore in unloading. This arrangement it will be observed avoids handling of the cars by stevedores or others and, consequently, avoids liability to damage or soiling during the process of stowing the cars away.

A ship constructed according to the invention may be loaded with a cargo of motor cars consigned to some port from which it will not be desired to load a return cargo of the same character. In this event, the arrangement of the portable decks facilitates the ship being readily converted or adapted to any particular cargo which it may be desired to take on board or stow for the return voyage. For example, the removal or dismantling of the portable deck may be readily effected and the holds rendered suitable for the stowage of grain.

While a specific example of the invention has been described it will be understood that the invention is not limited to the particular arrangement and details described, for example in place of or in addition to gangways, lifts or elevators may be employed for the transportation of cars or vehicles from deck to deck; also the number of hatchways and their arrangement may be varied to suit predetermined conditions or the distribution of the stowage space may be varied and the boiler and engine rooms located amidships instead of aft.

Looking at the drawings,

Fig. 1 illustrates the side elevation of a ship embodying the invention and partly cut away to disclose the interior arrangement of the decks and gangways.

Fig. 2 is a plan view of the upper deck whereon suitable rectangles indicate the position of motor cars when the deck is fully loaded.

Fig. 3 is a section taken through 3—3 of Fig. 2.

Fig. 4 is a section taken through 4—4 of Fig. 2.

Fig. 5 is a section taken through 5—5 of Fig. 2.

Fig. 6 is a partial plan view of one of the decks illustrating another embodiment of the invention wherein a movable platform is utilized to transfer the motorcar from one gangway to another.

In carrying the invention into effect according to one convenient mode the ship is built with its engine, boiler room, and crew's quarters aft, as indicated at E, Fig. 1, and with an upper permanent deck U and a lower permanent deck L designed for car stowage, and with a portable deck P—1 between the upper and lower permanent decks and a portable deck P—2 between the lower deck and the ship's bottom. The shelter deck is illustrated at S.

The ship is furnished with the usual masts and cargo hoists and in addition to the forward and aft cargo hatches 1 and 2 is equipped with comparatively large hatches C—1 and C—2 which are adapted to cover the hatchways H—1 and H—2 in which the connecting gangway G—1 and G—2 are constructed.

Gangway doors are furnished in the hull of the ship and are illustrated at D—1, D—2, D—3 and D—4 and afford communication between suitable gangplanks connecting the ship and dock and the different decks within the ship, such as the upper and lower decks for instance. These gangway doors are dimensioned to accommodate the largest vehicle it is desired to transport within the vessel.

According to this preferred design with the engine, boiler rooms, and ship quarters aft, the whole of the waist of the ship from the after bulkhead to the fore peak or fore peak hold is available for wheeled cargo.

Figs. 3 and 4 illustrate a design of the gangways which are adapted to connect the various decks to allow motor cars or other vehicles to be wheeled or driven under their own power from deck to deck.

Hatchways H—1 and H—2 are framed by the permanent framing, F, of the ship in the usual way as is illustrated in these figures, and the gangways and deck areas within the hatchways are portable and may be entirely removed if so desired, so that other cargoes than motor cars may be conveniently loaded and stored in the usual manner.

A gangway 4 is shown on the port side of the hatchway H—1 leading from the upper deck to the portable deck P—1 and sloping downwardly from the after part of the hatchway toward the forward part. This gangway is illustrated as made up of angle irons 5 and 6 (Fig. 4) adapted to support the floor of the gangway and also to furnish a low side wall of perhaps 6″ to 10″ so that the cars may not fall off. Beams 6′, 7, are detachably connected to the permanent framing F of the hatchway and serve to support a temporary partial deck 8 which is laid down to cover that area of the hatchway not taken up by the gangway 4 so that motor cars may be carried thereon.

Gangway 10 is similar to gangway 4 and connects portable deck P—1 with the lower deck and is shown positioned on the starboard side of hatchway H—1 sloping downwardly from the forward part of the hatchway toward the rear part of the hatchway.

Gangway 12 is of the same construction as gangways 4 and 10 and serves to connect the lower deck with portable deck P—2 and is placed on the port side of the hatchway sloping downwardly from the rear part thereof toward the forward part.

Gangway 14 is similar to the other gangways in construction and serves to connect portable deck P—2 with the ship's bottom and is illustrated as positioned on the starboard side of hatchway H—1 sloping downwardly from portable deck P—2 at the forward part of the hatchway to the ship's bottom at the rear part of the hatchway.

The details of construction of these gangways forms no part of the present invention, except that they must be sufficiently strong to support the weight of the heaviest vehicle it is desired to carry on the vessel and should be easily dismembered and stowed away. They can be readily constructed of standard steel forms adapted to be bolted to the permanent framing of the ship, or they may be hinged to swing upwardly out of the way when not in use.

Beams 15 and 16 serve to support a temporary deck 18 on the same level with portable deck P—1 within the area of the hatchway not occupied by gangway 4 and will serve to accommodate a number of motor vehicles. Beams 19 and 20 serve to support a portable deck, 21, on the same level with the lower deck and positioned between gangways 10 and 12. Beams 24 and 25 in like manner support a temporary deck area 22 on a level with portable deck P—2 and lying between gangways 12 and 14. These temporary deck areas within the hatchway will serve to accommodate a number of motor cars or other vehicles.

The beams 6, 7, 15, 16, 19, 20, 24 and 25 may be made of standard steel sections bolted or otherwise secured to the framework F of the hatchway so that they also may be readily removed as the gangways themselves are removable and with them the temporary deck areas 8, 18, 21 and 22 may be removed and stored away, leaving the hatchway entirely clear for the loading of some other kind of cargo other than motor vehicles.

The portable decks P—1 and P—2 are supported by suitable cross beams 25, 26 for instance, bolted or otherwise removably secured to the permanent framework of the ship and in turn reenforced by tension elements 30 and 31 for instance, which may be detachably connected to the framework of

the upper deck and the lower deck respectively.

The floor of the portable decks may be made of ordinary wooden boards laid parallel to each other and the ends of which may be readily secured in place by means of a strip of angle iron 35 for instance, as shown in Fig. 3.

The temporary deck areas 8, 18, 21 and 22 may be made in a like manner.

As illustrated in Fig. 2 the gangways themselves may be utilized to store the last few cars loaded onto the ship so that practically all of the cargo area is efficiently used even the hatchway area.

In loading a ship of this kind it is only necessary to connect one or more of the gangway doors of the dock by a suitable gangplank up or down which the motor vehicles may be pushed or driven under their own power and after they have entered the ship may be stowed away by driving them up or down the various gangways to the desired position and the deck areas are not encumbered with any more beams, columns or other framework than is necessary, so that it is readily possible to position the vehicle in any desired place upon any one of the decks.

In Fig. 6 I have illustrated an embodiment of the invention which incorporates a movable truck at the ends of the gangways adapted to move transversely of the longitudinal axis of the ship upon suitable tracks or runways. For instance, a movable table or platform T—1 might be placed on the lower deck at the rear end of hatchway 1 and adapted to move on tracks 40, 41 from a position immediately in front of port gangway 12 to a position immediately in front of starboard gangway 10, and a similar truck T—2 movable on tracks 44 and 45, shown in dotted lines, might be placed on portable deck P—2 to connect the ends of gangway 12 and gangway 14. Truck T—1 is of sufficient size to accommodate a vehicle which may be placed thereon immediately after coming down gangway 10 for instance, and then the truck and the vehicle may be pushed or otherwise moved across the end of the hatchway until it is positioned at the upper end of gangway 12, when the car may be transferred from truck T—1 to gangway 12 from which it will pass on to truck T—2 which will serve to carry it over into juxtaposition with gangway 14. Each deck may be so equipped at the ends of the gangways. In this manner a car will be driven down one gangway forwardly and the next gangway rearwardly, but, of course, it will be unnecessary to turn or reverse or maneuver the car in any way and the addition of these movable tables although not absolutely necessary to the efficient loading of the vessel will serve to expedite it.

Provision must be made for lashing the vehicles in place and may consist of ropes and chocks or of mechanical clamping or receiving devices. Inasmuch as methods and apparatus for performing this function are well known it is deemed unnecessary to illustrate them in detail.

It will be noted from this description that a vessel incorporating this invention may be readily transformed from a ship adapted to carry wheeled vehicles most efficiently and enable the loading and unloading thereof without the use of slings or cranes or crates to a standard cargo vessel with the usual open hatchways and the usual space between decks, if this space is desirable. Such a vessel may be efficiently used to transport vehicles on one voyage and an entirely different cargo upon the return voyage.

I claim:—

1. A ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, including permanent and portable decks, a hatchway affording communication with said decks, and a gangway in said hatchway adapted to connect said decks so that vehicles may be transferred from one deck to another on their own wheels.

2. A ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, including a plurality of decks, a hatchway affording communication with said decks, and a portable gangway adapted to be erected in said hatchway to connect said decks so that vehicles may be transferred from one deck to another on their own wheels when said ship is used for a vehicle cargo and adapted to be dismantled when said ship is used for general cargo leaving the hatchway clear.

3. A ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, including permanent decks and portable decks, a hatchway affording communication with said decks, and a portable gangway adapted to be erected in said hatchway to connect said decks so that vehicles may be transferred from one deck to another on their own wheels when said ship is used for a vehicle cargo and adapted to be dismantled when said ship is used for general cargo leaving the hatchway clear.

4. A ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, including a plurality of decks, one or more hatchways, portable gangways and deck areas adapted to be erected in said hatchway or hatchways to connect said decks so that vehicles may be transferred from one deck to another on their own wheels when said ship is used for vehicle cargo and adapted to be dismantled when said ship is used for general cargo leaving the hatchway or hatchways clear.

5. A ship adapted to be transformed from

a general cargo vessel to one especially fitted for the transportation of vehicles, including permanent decks and portable decks, one or more hatchways, portable gangways and deck areas adapted to be erected in said hatchway or hatchways to connect said decks so that vehicles may be transferred from one deck to another on their own wheels when said ship is used for a vehicle cargo and adapted to be dismantled when said ship is used for general cargo leaving the hatchway or hatchways clear.

6. In a ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, a plurality of decks, gangways connecting said decks so that vehicles may be transferred from one deck to another on their own wheels, and gangway doors in the side of said ship adapted to communicate with gangplanks leading to a dock and of sufficient size to allow the passage of the vehicles therethrough.

7. In a ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, permanent decks, temporary decks adapted to be erected between said permanent decks when the ship is to be used to carry vehicles, gangways connecting said decks so that vehicles may be transferred from one deck to another on their own wheels, and gangway doors in the side of said ship adapted to allow the vehicles to be transferred from gangplanks connecting the ship and dock to one of the decks of the ship.

8. A ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, including a plurality of decks, one or more hatchways, portable gangways and deck areas adapted to be erected in said hatchway or hatchways, said gangways to connect said decks so that vehicles may be transferred from one deck to another on their own wheels when the ship is used for vehicle cargo, and said gangways and deck areas adapted to be dismantled when the ship is used for general cargo, leaving the hatchway or hatchways clear.

9. A ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, including a plurality of decks, a hatchway passage passing downwardly through the upper deck and affording communication with all said decks, and a portable gangway adapted to be erected in said hatchway passage to connect said decks, so that vehicles may be transferred from one deck to another on their own wheels when such ship is used for a vehicle cargo and adapted to be dismantled when said ship is used for general cargo, thus leaving the hatchway passage clear.

10. A ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, including a plurality of decks, one or more hatchways through said decks affording communication therebetween, gangways in said hatchways adapted to be erected to connect said decks so that vehicles may be transferred from one deck to another on their own wheels, and of such proportions and arrangement relative to said hatchways as to leave a continuous open hatchway space from the upper deck to the lower deck when said gangways are in position.

11. A ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, including permanent and portable decks, a hatchway affording communication with said decks, a gangway in said hatchway adapted to connect said decks so that vehicles may be transferred from one deck to another on their own wheels, and movable supporting means adapted to receive a vehicle and allow it to be transferred from the end of one section of said gangway to the end of another section of said gangway on the same deck level.

12. A ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, including permanent and portable decks, a hatchway affording communication with said decks, a gangway in said hatchway adapted to connect said decks so that vehicles may be transferred from one deck to another on their own wheels, and movable supporting means adapted to receive a vehicle and to move transversely of the longitudinal axes of the vessel.

13. A ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, including a plurality of decks, a hatchway affording communication with said decks, a portable gangway adapted to be erected in said hatchway to connect said decks so that vehicles may be transferred from one deck to another on their own wheels when said ship is used for a vehicle cargo and adapted to be dismantled when said ship is used for general cargo leaving the hatchway clear, and movable supporting means adopted to receive a vehicle and allow it to be transferred from the end of one section of said gangway to the end of another section of said gangway on the same deck level.

14. A ship adapted to be transformed from a general cargo vessel to one especially fitted for the transportation of vehicles, including a plurality of decks, a hatchway affording communication with said decks, a portable gangway adapted to be erected in said hatchway to connect said decks so that vehicles may be transferred from one deck to another on their own wheels when said ship is used for a vehicle cargo and adapted to be dismantled when said ship is used for general

cargo leaving the hatchway clear, and movable supporting means adapted to receive a vehicle and to move transversely of the longitudinal axes of the vessel.

In testimony whereof I have signed this specification this 17th day of October, 1929.

EDMUND H. WATTS.