Aug. 9, 1949. E. BEUTEL ET AL 2,478,177

GANGWAY

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Fig 1

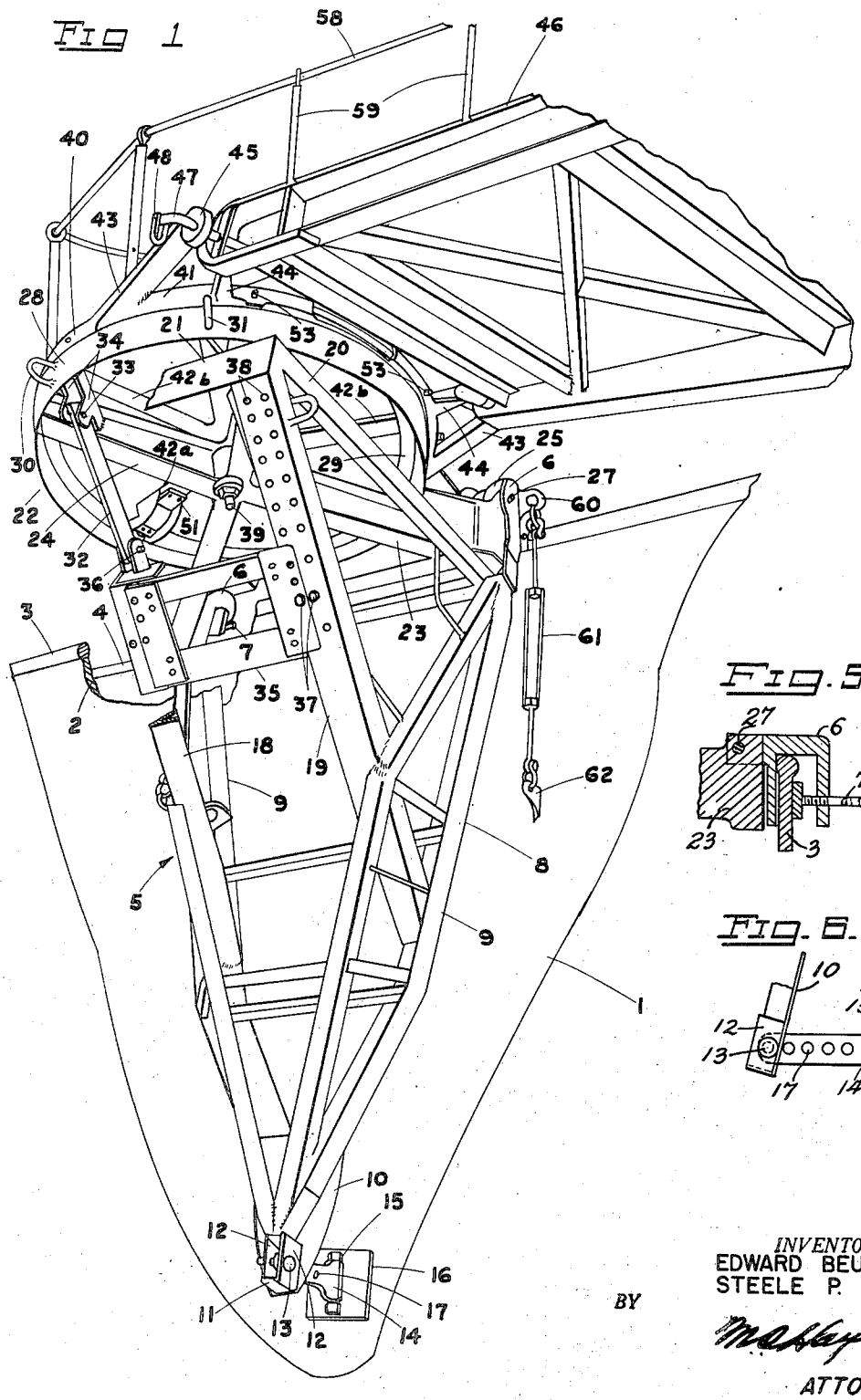


Fig. 5.

Fig. 6.

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FIG 2

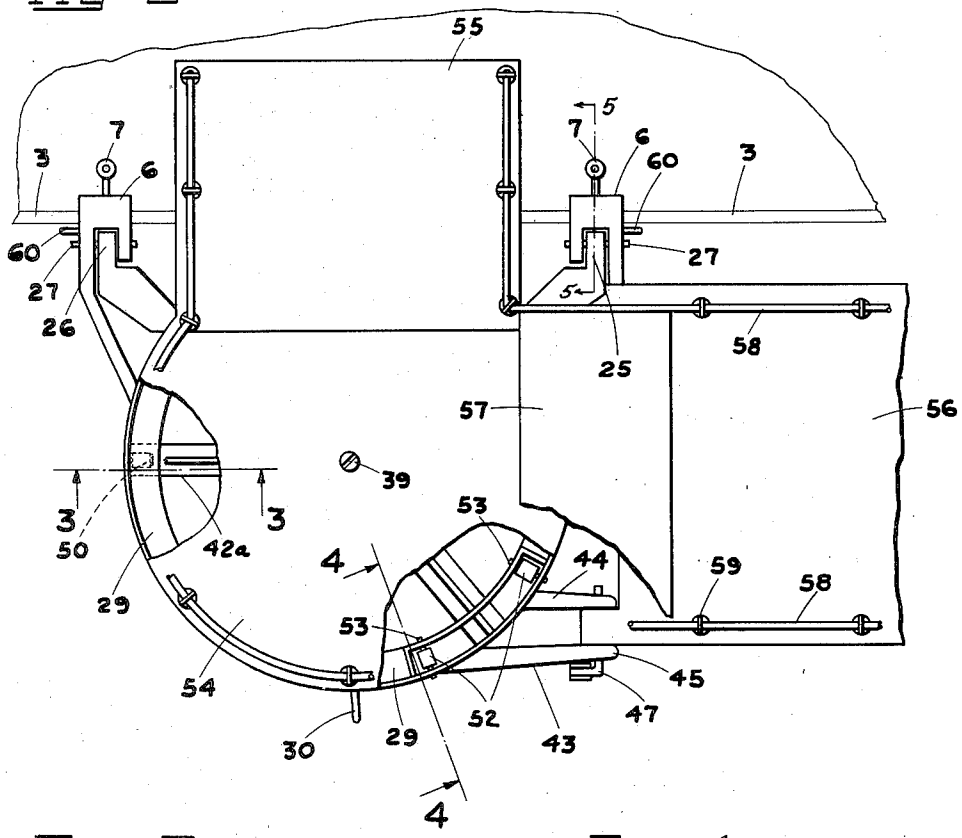


FIG 3

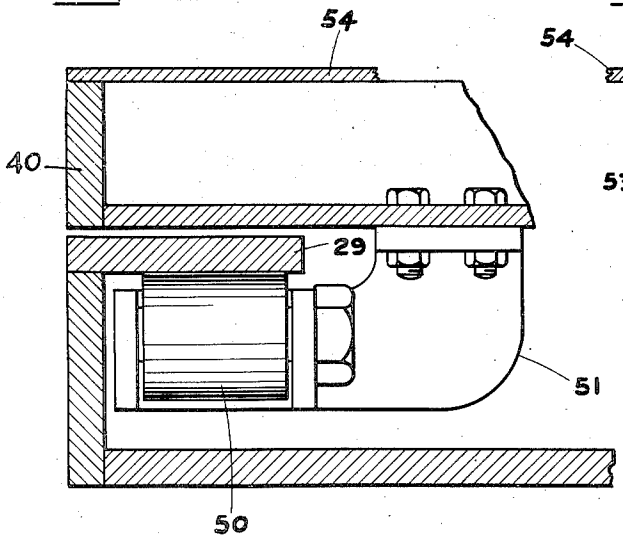
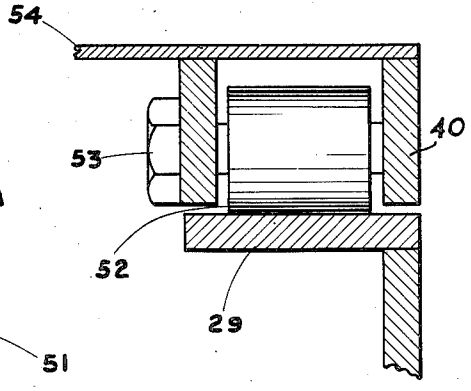


FIG 4



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GANGWAY

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Application April 3, 1946, Serial No. 659,420

1 Claim. (Cl. 14—71)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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This invention relates to gangways and more particularly to adjustable gangways for use on ships in tidewater.

An object of the invention is to provide a gangway for ships which automatically adjusts itself with the rise and fall of the tide so as always to be in a convenient position for use from the end contacting the ship.

Another object of the invention is to provide a gangway which is readily adjustable to any convenient angle of approach to the side of a ship.

A further object of the invention is to provide a gangway having a gangway platform fastened to the side of a vessel and adjustable to assume a horizontal position so as to compensate for list of the vessel or variations in its contour, together with a gangplank or brow pivoted on said platform about a normally horizontal axis and means to facilitate rotating said platform and said gangplank or brow as a unit about a normally vertical axis through substantially 180° to dispose the gangplank at any convenient angle to the side of the vessel.

In accomplishing these and other objects of the present invention, we have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a gangway embodying the features of the present invention mounted on the side of a ship, with portions broken away to show the relation of its elements.

Fig. 2 is a top plan view of the gangway, with portions broken away.

Fig. 3 is a detail view of a bearing roller used in the gangway taken along the line 3—3 of Fig. 2.

Fig. 4 is a detail view of another bearing roller used in the gangway taken along the line 4—4 of Fig. 2.

Fig. 5 is a detail view of a hook used in the gangway and is taken along line 5—5 of Fig. 2.

Fig. 6 is an elevational view showing the mechanism for connecting the lower end of the gangway support to the side of the vessel.

Referring more in detail to the drawings:

The numeral 1 designates a portion of the side of a vessel partially broken away as at 2 to show more clearly the mounting of the gangway. The vessel is shown as having a small raised coaming or sheer strake 3 extending upwardly from the deck 4. A support for the gangway platform generally indicated by the numeral 5 is hung on the coaming 3 by a pair of bifurcated hooks 6. The hooks 6 are clamped against the coaming by

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means of set screws 7. The support 5 is constructed of structural steel members, such as channels, angles or the like, welded or otherwise conveniently fastened together.

A depending portion of the support generally indicated by the numeral 8 is formed of angle iron, such as the members 9 joined together at their lower ends to form the apex of a more or less triangular unit. Welded to the members 9 and other elements at the apex is a plate 10 to which is attached a yoke 11 having a pair of journal plates 12. A pivot pin 13 extends through coaxial openings in the plates 12 for supporting a thrust arm 14, hinged as at 15 about a generally vertical axis to a thrust pad 16 which bears against the side of the vessel. The thrust arm has a plurality of openings, such as 17, through any one of which the pin 13 may be inserted, thus affording an adjustment to accommodate the use of the device to vessels of various contours. The thrust arm and thrust pad combination serves to transmit to the side of the vessel the force caused by the weight of the gangway exerting a torque about the axis of the pins hereinafter described as extending through the bifurcated portions of the hooks 6. The support 5 has two identical angle iron brace members 18 and 19 extending outwardly and upwardly from the depending members 9 of the support 8. The angle iron members 18 and 19 are joined by other structural members such as 20 and 21 (portions of which are broken away to more clearly show other parts of the device) to form a rigid, strong structure for supporting the gangway platform.

A base or supporting platform generally indicated by the numeral 22 is constructed of two crossed I-beams 23 and 24 having end bearing portions welded or otherwise fixed thereto as at 25 and 26 for pivotally connecting the base to the bifurcated hooks 6 through the medium of pivot pins 27. Welded or otherwise attached to the I-beams is an annular ring or rim 28 having an internally extending flange 29. The rim 28 is described about an axis coincident with the intersection of the crossed I-beams. For lifting the device, a plurality of pad eyes, such as those shown at 30 and 31, are welded to the rim 28 at intervals around the circumference thereof.

The outboard portion of the platform or base 22 is supported by two connecting rods 32 (one obscured by angle iron 19) articulately connected to the platform 22 as by a pivot pin 33 extending through two short ears 34 welded between the I-beam spokes 23 and 24 and the rim 28 of the platform. The connecting rods 32 are

articulately attached at their other ends to the upper side of a cross-head slide generally indicated by the numeral 35 by means of pins 36. The slide is adjustable along the angle iron brace members 18 and 19 which serve as guides therefor. The slide 35 is conveniently constructed of various plate and angle iron pieces bolted or welded together and arranged to overlap both sides of the flanges of the angle members 18 and 19. The slide 35 is held in any desired position of adjustment by bolts 37 passing through openings in the slide 35 and any of a plurality of openings 38 in the members 18 and 19.

Pivotally mounted on the platform 22 to turn about the generally vertical axis of a pivot pin 39 is a turntable 40 constructed of a ring or rim 41 strengthened by a plurality of spokes such as 42*a* and 42*b*, conveniently in the form of T-sections. Extending transversely from the ring 41 are two longer arms 43 and two shorter arms 44 having bearing blocks such as 45. A brow or gangplank of conventional construction generally indicated by the numeral 46 is hinged to the arms 43 and 44 by hinge pins such as 47 bent at right angles so as to be prevented from slipping out of position by means of U-shaped keepers 48 attached to the arms 43. To aid in permitting the rotation of the turntable 40 relative to the platform 22, a plurality of rollers is interposed between the adjacent surfaces thereof. As best shown in Fig. 3, roller 50 is mounted by means of a bracket 51 attached to one of the spokes 42*a* of the turntable 40. As best shown in Fig. 3, this roller engages the underside of the flange 29 of the base 22 and is placed diametrically opposite the axis of the hinge pins 47. Other rollers of similar design such as 52, as shown in Figs. 2 and 4 are mounted by means of pins 53 on the turntable 40 to bear on the upper side of the flange 29. The rollers 52 are placed at intervals about the semi-circle or half of the ring 41 between the axis of the hinge pins 47 and the diameter of the ring 41 parallel to said axis. The turntable has a top in the form of a circular plate 54 which may be perforated, if desired, to reduce its weight. To bridge the gap between the deck 4 of the ship and the turntable top 54, a plate 55 is used. Similarly to bridge the gap between the turntable top 54 and the tread surface 56 of the brow a plate 57 is used. To insure safety in the use of the gangway a conventional hand rail is provided in the form of ropes 58 passing through eyes in stanchions 59 which are removably inserted in appropriate sockets formed in the plate 55, the turntable 40 and the brow 46. To anchor the entire assembly to the vessel, pad eyes 60 are formed on the bifurcated hooks 6. To each of these pad eyes is attached a turnbuckle linkage 61 connected at its lower end to a lug 62 tack-welded to the side of the vessel, thus anchoring the entire supporting frame to the vessel.

Operation

To use the device, hooks from a sling depending from a crane are attached to the several pad eyes 30 and 31. The crane lifts the entire framework (without any brow attached thereto) and swings it adjacent the side of a vessel lowering it down until the hooks 6 engage the coaming 3. In the event that the vessel is of the flush deck type which has no projecting coaming, short pads or sections of angle iron may be welded to the deck of the vessel to serve as supports for the hooks 6. The thrust pad 16 now engages the lower portion of the side of the hull of the vessel and with the crane still supporting the weight of the framework the pin 13 may be removed and replaced in that particular hole 17 which will render the plane of the base or platform 22 most nearly horizontal. The crane sling is now released permitting the vertical components of the weight of the apparatus to be taken by the hooks 6 and the coaming 3 and the side thrust caused by the torque exerted by the weight of the apparatus about the axis of the pins 27 to be taken by the thrust arm 14, the thrust pad 16 and the side of the vessel. If, because of a list of the vessel or because of an unusual salient or reentrant contour of the hull at the point of contact of the pad 16, the plane of the platform 22 is not substantially horizontal, it is adjusted to the horizontal position in the following manner. The crane sling hooks are engaged in the outboard pad eyes 30 and 31. The bolts 37 are removed and the crane sling lifted or lowered, as the case may be, until the platform 22 assumes a horizontal position. During this motion, the cross-head slide 35 moves along the guide angles 18 and 19 and the frame composed of the I-beam members 23 and 24 pivots about the pins 27. When a substantially horizontal position has been achieved, the bolts 37 are replaced in the appropriate holes 38. The crane sling may now be released from the outboard pad eyes 30 and 31 since the outboard portion of the platform 22 is now supported by the connecting rods 32. A brow appropriate to the height of the deck above the roadway of the pier and appropriate to the desired location of the end of the brow on the pier is now chosen, picked up by a crane and mounted on the turntable by inserting the hinge pins 47 through the arms 43 and 44 and the longitudinals of the brow. The hinge pins are rotated until the transversely bent ends are guarded by the U-shaped keepers 48 and, if desired, a chain and pin may be placed on each keeper 48 to form a closed lock to prevent the accidental displacement of the pins 47. The outboard end of the brow 46 can now be swung by means of the crane sling into any convenient location on the deck or pier. As this outer end is swung the turntable 40 pivots about the pin 39, its motion being facilitated by the provision of the bearing rollers 50 and 52. When the brow is finally in its appointed place the stanchions 59 are inserted and the ropes 58 are strung through them and the bridging plates 55 and 57 are laid in place. The turnbuckle linkages 61 are now put in place and tightened and the gangway is ready for use. The weight of the brow and its load being transmitted to the turntable through the pins 47 exerts a torque on the turntable about a diameter of the turntable extending through the pivot pin 39 parallel to the axis of the pins 47. This would tend to press the half of the turntable adjacent the brow downward and the half of the turntable remote from the brow upward. Since the rollers 52 are above the flange 29 and the roller 50 is below the flange 29 this torque simply causes all the bearing rollers to engage the bearing surface of the flange 29 the more firmly. If the roller 50 had been placed above the flange 20 the torque would have tended to disengage the roller from the bearing surface. The rise and fall of the tide does not disturb the device of the present invention but merely causes the brow to pivot about the pins 47 as the entire ship rises and falls.

It is apparent that the present invention permits the brow to be swung about a generally vertical axis through an arc of approximately 180° so that the brow need not extend at right angles to the side of the ship and thereby obstruct a large portion of the area of a narrow pier, but may be disposed almost parallel to the side of the ship so as to take up little space along the pier.

It is also apparent that we have provided a gangway which can be quickly and easily installed and which requires a minimum of attention while in use. The automatic accommodation of the gangway to the rise and fall of the tide obviates the necessity of changing gangways formerly required. The present invention eliminates the danger of the hazardous step at the top and bottom of gangways as installed in the prior art and permits the use of fairly long gangways having an easy approach even on narrow docks or piers.

While we have shown but one embodiment of our invention, it is apparent that the device is susceptible to modification without departing from the spirit of the invention. We do not wish, therefore, to be limited by the disclosures set forth, but only by the scope of the appended claims.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

We claim:

A device of the character described for use on a vessel comprising a supporting member having hook portions for hanging onto said vessel, a depending portion adapted to extend from said hook portions over and adjacent the side of the vessel, an arm pivotally mounted on the lower

end of said depending portion to turn about a normally horizontal axis, a thrust pad for contact with the side of the vessel pivoted to said arm about a normally vertical axis, brace members fixed to said depending portion near its lower end and extending upwardly and outwardly from the side of the vessel, guide portions on said brace members, a cross-head member spanning said guide portions and slidably adjustable therealong, means for holding said cross-head member in adjusted position along said guide portions, a platform pivotally connected to said hook portions for adjustment about a normally horizontal axis adjacent the side of the vessel, connecting rods connected between said cross-head member and the outboard portion of said platform to adjust said platform to a substantially horizontal position, a turntable member pivoted to said platform to turn about a normally vertical axis, rollers mounted on said turntable for contact with said platform to facilitate turning said turntable relative to said platform, and a brow pivoted to said turntable for adjustment about a normally horizontal axis.

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