March 13, 1934. L. J. MAXSON ET AL 1,950,413

CRADLE

Filed June 15, 1932 3 Sheets-Sheet 1

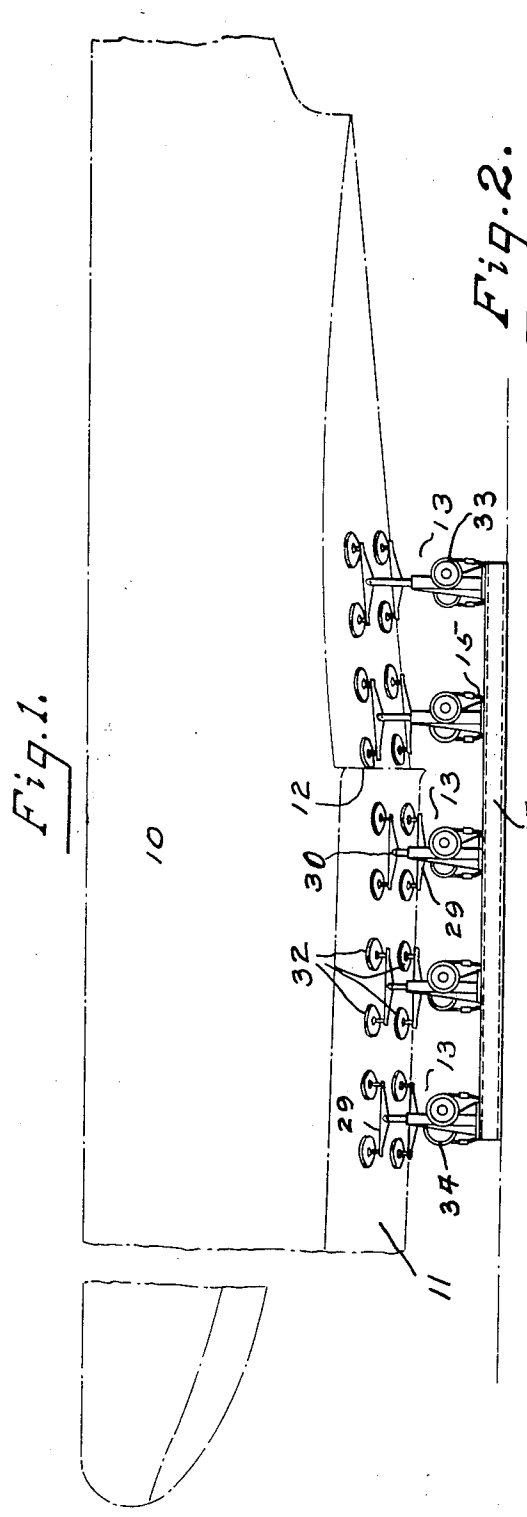


Fig. 1.

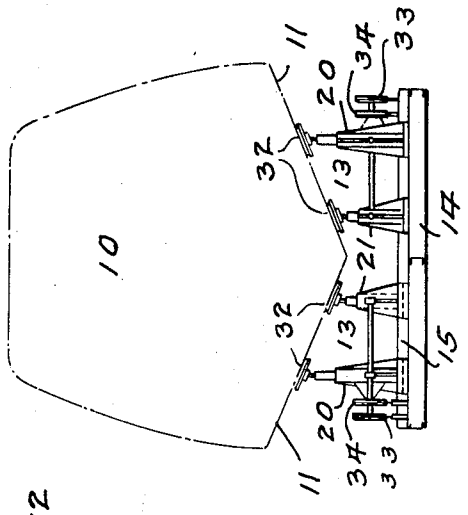


Fig. 2.

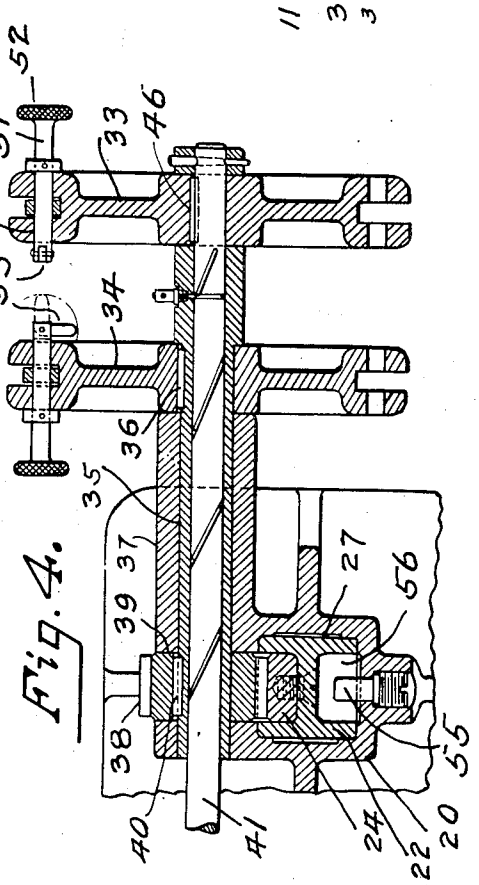


Fig. 4.

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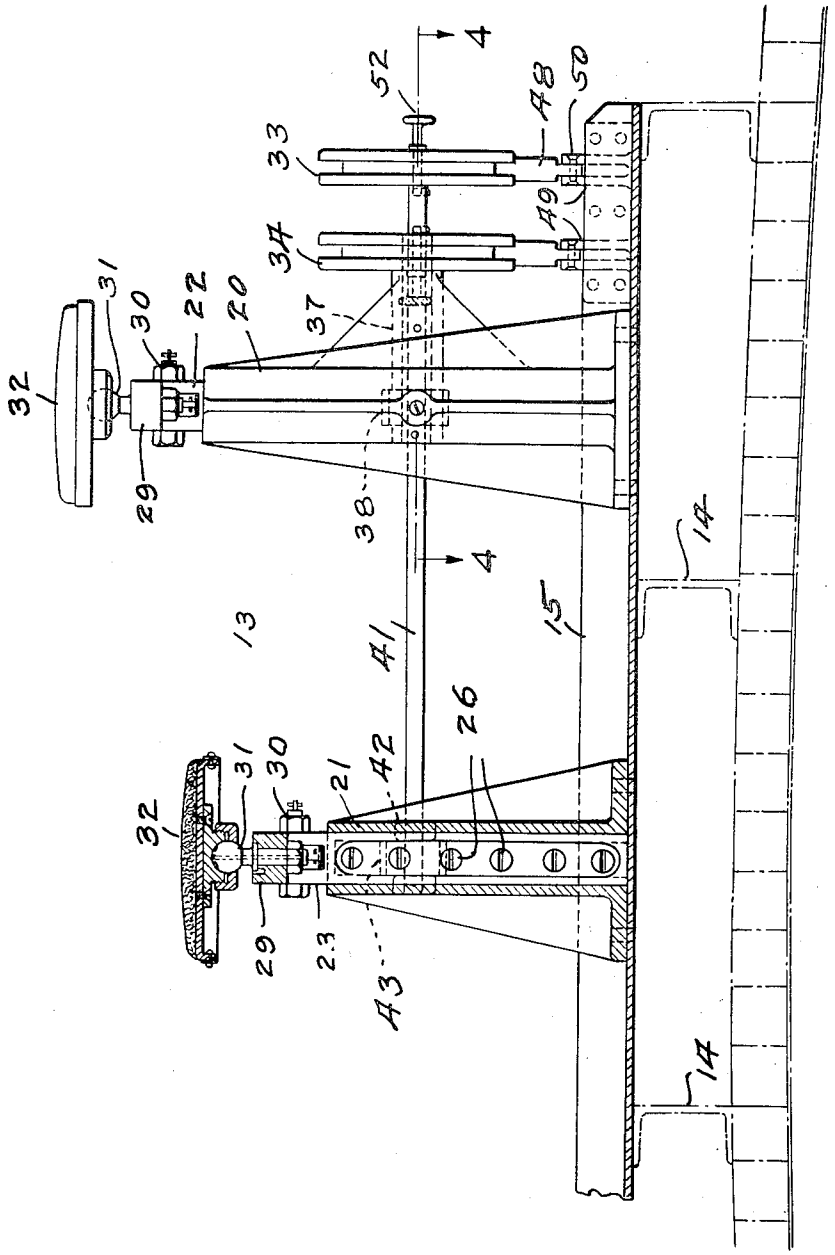


Fig. 3.

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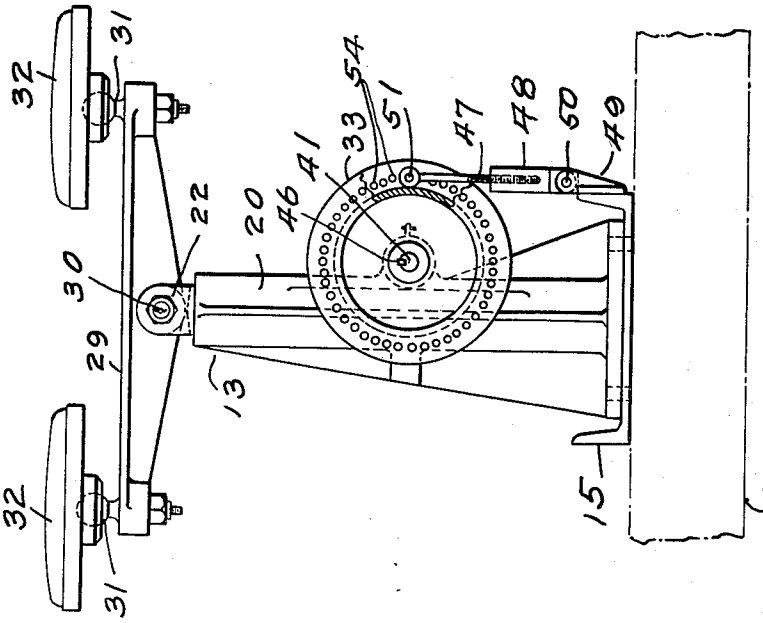


Fig. 5.

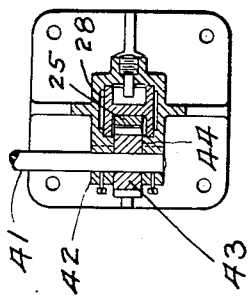


Fig. 7.

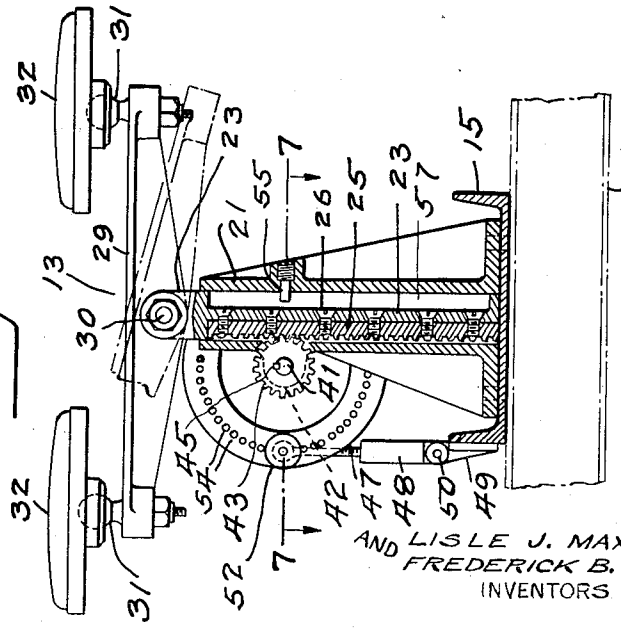


Fig. 6.

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Patented Mar. 13, 1934 1,950,413

UNITED STATES PATENT OFFICE

1,950,413

CRADLE

Lisle J. Maxson, United States Navy, and Frederick B. Gross, McLean, Va.

Application June 15, 1932, Serial No. 617,406

3 Claims. (Cl. 61—66)

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

Our invention relates broadly to cradles for use in handling and transportation of aircraft, and more particularly to the improvements in the units forming the saddles of cradles.

The principal object of our invention is to provide a cradle adapted to universal use in the transportation and stowage of seaplanes and flying boats.

A further object of our invention is to provide a unit adapted to multiple installation and adjustable to fit all of the various shapes and sizes of the bottoms of aircraft pontoons, floats or hulls, and a unit that may be standardized and fabricated to meet future requirements of even larger aircraft handling and transportation demands by the addition of units.

Another object of our invention is to provide a device of the character described that is rugged, light in weight, and one that can be adapted to universal use and easily installed or replaced.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts as will be described more fully hereinafter.

Reference is to be had to the accompanying drawings forming a part of this specification, in which like reference characters indicate corresponding parts throughout the several views, and in which:

Fig. 1 is a fragmentary side elevation of a hull of a flying boat resting upon our universal cradle;

Fig. 2 is an end view of parts shown in Fig. 1;

Fig. 3 is an enlarged transverse view with parts in elevation and parts in section of one of the adjustable units of the cradle;

Fig. 4 is a vertical section on line 4—4 of Fig. 3;

Fig. 5 is a detail side elevation of one of the outer members of a unit;

Fig. 6 is a detail vertical section of one of the inner members of a unit;

Fig. 7 is a detail vertical section through a portion of the adjusting mechanism taken on line 7—7 of Fig. 6.

Referring more particularly to the drawings, 10 indicates a portion of a conventional pontoon, float or hull of an airplane. For the purpose of illustration we have shown a bottom 11 of V construction having a single step 12, being supported by a series of our adjustable saddle units 13 mounted upon a foundation frame 14.

Our improved device is designed to accommodate floats, pontoons or hulls of aircraft of the types having bottoms with single or multiple step construction, as well as of uneven contours, in flat planes or of curved contours common to the variety of bottoms in use.

The arrangement of the universal cradle is such that a plurality of the adjustable saddle units 13 arranged in opposed pairs are spaced apart in fore-and-aft alignment and secured to the foundation frame 14, as shown by reference to Figs. 1 and 2. Each pair of saddle units 13 are tied together transversely by a cross member 15 of the frame 14.

As each unit is independently adjusted, a description of one will be sufficient.

A unit 13 consists of an outer standard 20 and an inner standard 21 which are provided with adjustable members 22 and 23 equipped with toothed racks 24 and 25 secured by screws 26 and movable up and down in the guide ways 27 and 28 formed in the standards 20 and 21 (see Fig. 3). Each of the adjustable members 22 and 23 is equipped with a cross arm 29 which is free to rock upon the central pivot 30, and each is provided at its outer end with a ball joint connection 31 upon which are located surface engaging pads 32 for receiving their respective portion of the weight of the hull 10.

For moving the members 22 and 23 up and down and for adjusting the pads 32 to the bottom 11, we mount hand wheels 33 and 34 within convenient reach from the outer edge of the foundation frame 14. The wheel 34 is secured to a sleeve 35 by a key 36, and a bearing 37 is located on the standard 20. A pinion 38 located in a recess 39 in the standard 20 is in mesh with the teeth on the rack 24. The pinion 33 is secured to the sleeve 35 by a key 40. When the wheel 34 is turned by hand, the force is thus transmitted through the sleeve 35 and pinion 38 to move the member 22. When the wheel 33 is turned by hand, the force is transmitted through a shaft 41 having bearings in the sleeve 35 and extending to bearings 42 in the standard 21. A pinion 43 located in a recess 44 is secured to the shaft 41 by a key 45, and the wheel 33 is secured to the same shaft by a key 46. The pinion 43 is in mesh with teeth of the rack 25 and, when turned by the wheel 33, causes the member to adjust the pads 32 carried by the cross arm 29.

Each of the hand wheels 33 and 34 is provided with facilities for locking the same in adjusted position, which consist of a link 47 having an eye on the upper end and threaded into a sleeve 48 connected to a bracket 49 by a pin 50 and secured to the cross member 15 of the base. A release pin 51 having a head 52 and an offset button lock 53 is passed through registering apertures

54 around the flanges of the wheels 33 and 34 to secure each unit in locked position after an adjustment has been made.

In order to limit the movement of the members 22 and 23, stop pins 55 are provided in the standards 20 and 21 which extend into grooves 56 and 57.

In the operation of the device, all pads 32 are lowered by the hand wheels 33 and 34 to the full-down position, and the seaplane hull, pontoon or float is lowered by the hook of a hoisting crane and sling until the desired level position is reached above the cradle units 13. The hand wheels 33 and 34 are then turned to raise the pads until they engage the bottom of the hull with a uniform pressure. The hand wheels are then locked in position by inserting the pins 51 and the hoisting lines are cast off.

No additional adjustments are necessary, and the cradle can be used repeatedly for the stowage of a designated type as long as desired.

The pads are cushioned and when properly adjusted will prevent slippage of the float. However, when an airplane is in transportation, precaution against tipping over to the side is accomplished by securing of the hold-down lines from the wings to the deck.

We desire it to be understood that although we have described a pinion and rack for raising and lowering the pads 32, any other raising or lowering means, such as a worm and screw, may be utilized.

It will be understood that the above description and accompanying drawings comprehend only the general and preferred embodiment of our invention, and that various changes in construction, proportion and arrangement of parts may be made within the scope of the appended claims without sacrificing any of the advantages of our invention.

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

What we claim is:

1. A racking cradle unit for aircraft floats having bottoms of uneven contour comprising, a base plate, a plurality of evenly spaced standards arranged in pairs on the base plate, supporting members movably mounted in said standards, cross arms pivotally secured to the supporting members, pads universally attached to each end of said cross arms, a rack secured to each of said supporting members, and means for raising and lowering each pair of the supporting members, said latter means consisting of a hollow shaft having a pinion meshing with the rack on one of said supporting members, a second shaft extending through the first shaft and having a pinion meshing with the rack of the second supporting member of the pair, hand wheels having a series of apertures adjacent their periphery mounted on each of said shafts for rotating the same, and adjustable links having locking pins pivotally secured to each standard whereby the locking pins can be inserted into the apertures of the hand wheels to lock the supporting members in position.

2. In a device for the stowage of aircraft having a float provided with a bottom of uneven contour, in combination, a base, a plurality of standards secured to said base in groups of two arranged transversely thereof, guide ways in said standards, adjustable members adapted to move vertically within said guide ways, toothed racks provided upon each of said adjustable members, pinion gears in mesh with said toothed racks, shafts for said pinions, hand wheels for rotating said shafts, cross arms pivotally mounted upon each of said adjustable members, a plurality of cushioned pads universally mounted on said cross arms for engagement with the float bottom, and means for locking each of said hand wheels independently and thereby hold said cushion pads in adjusted contact with the float bottom by preventing movement of said rack and pinion supporting said cross arm.

3. In a support unit assembly for uniformly receiving with even distribution of weight of an aircraft float by contact with the uneven contour of the float bottom, in combination, a plurality of standards grouped at intervals beneath the float, adjustable members guided vertically by said standards, cross arms pivotally mounted upon each of said movable members, cushioned pads universally mounted at the ends of said cross arms for contact with the float bottom, a rack upon each of said adjustable members, a hollow shaft having a separate pinion in mesh with each of certain of said racks, a second shaft extending through said hollow shaft and having separate pinions meshing with each of the alternate racks, hand wheels for each of said shafts for actuating said shafts, said hand wheels having a series of apertures adjacent the rim thereof and adjustable links pivotally mounted at their lower ends upon each of said standards, a pin adapted for engagement with the apertures in said hand wheels located at the upper end of said links for securing said hand wheels against movement.

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