

Aug. 16, 1955

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2,715,535

LOAD HANDLING WHEELED SKID

Filed Feb. 6, 1953

4 Sheets-Sheet 1

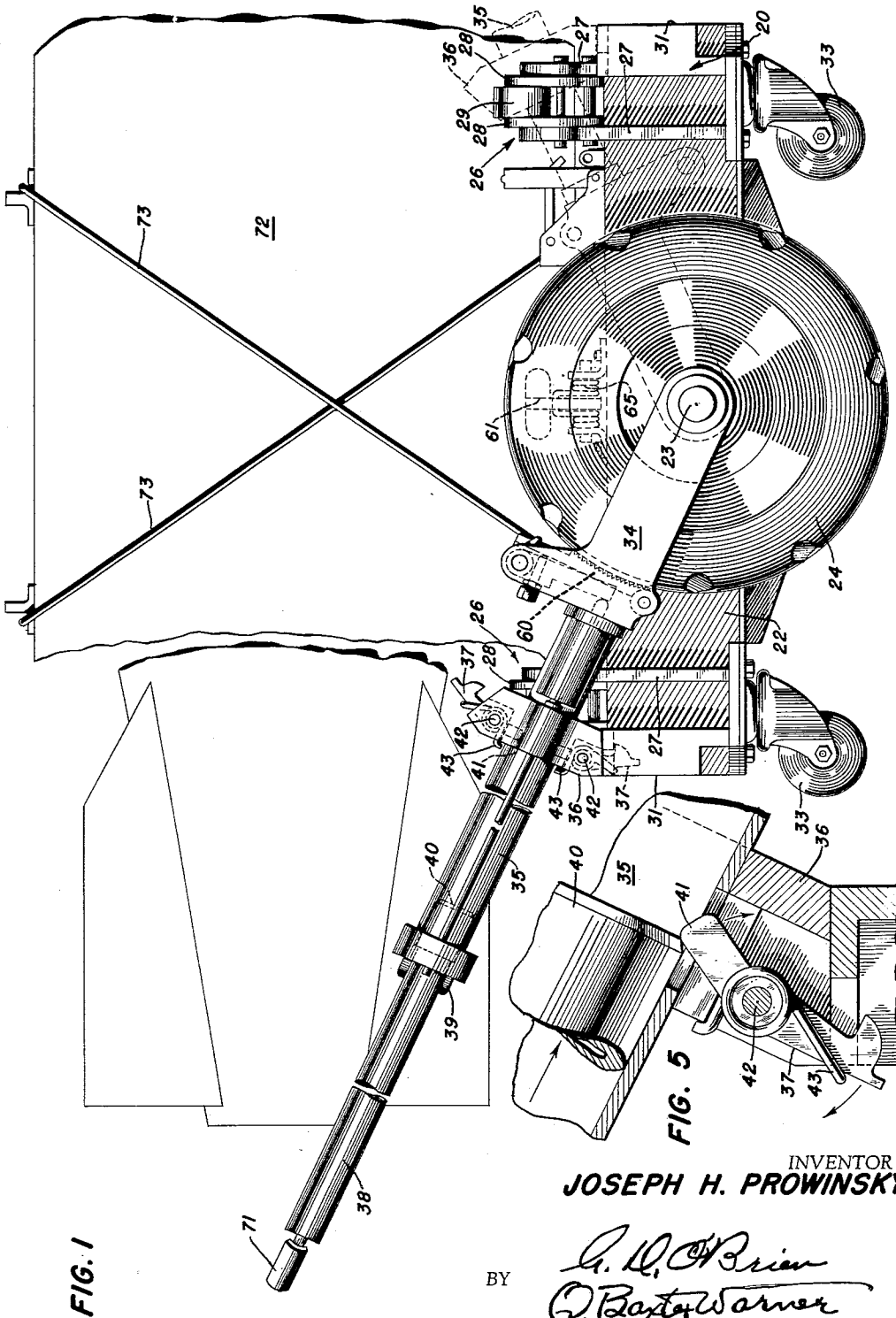


FIG. 1

FIG. 5

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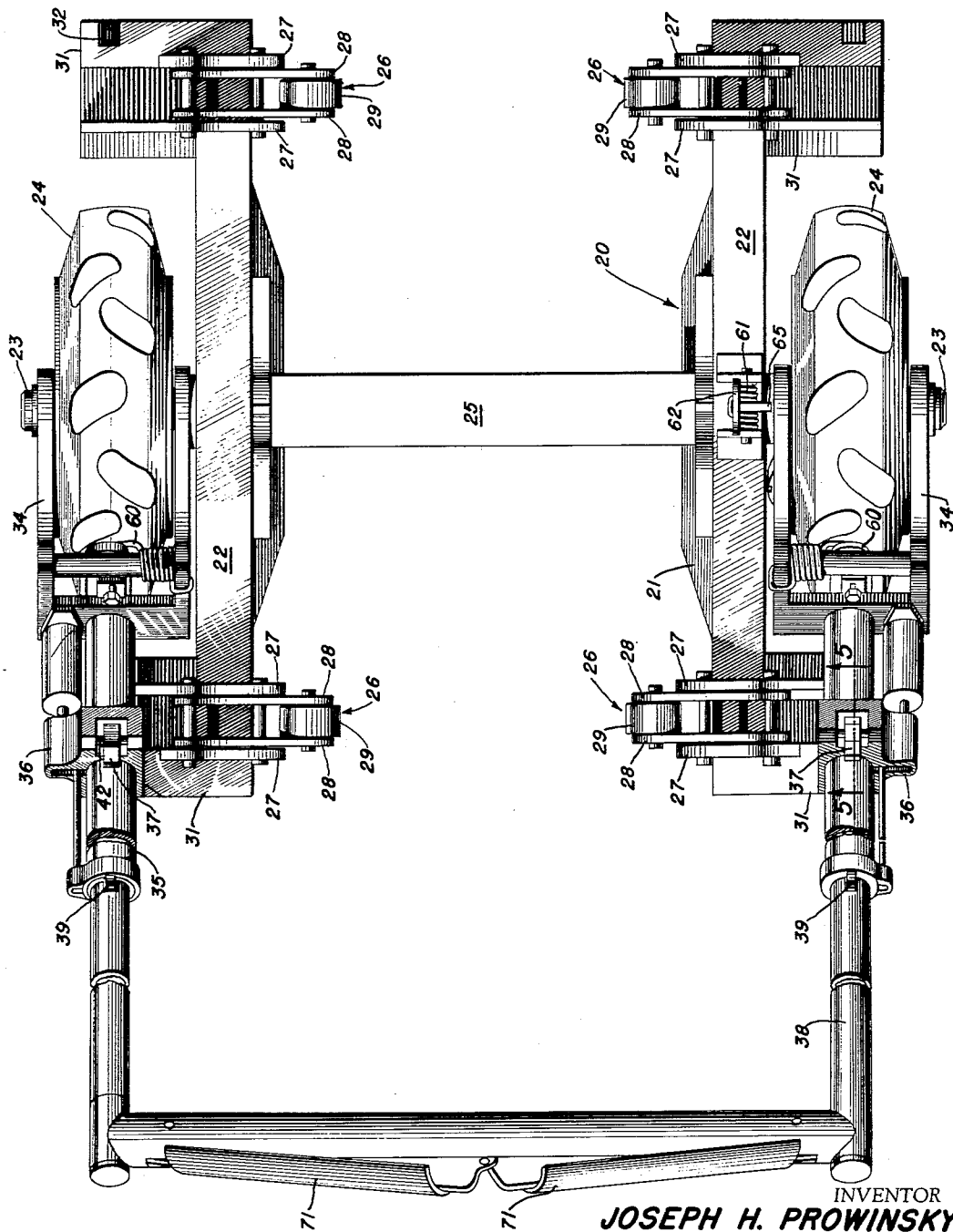


FIG. 2

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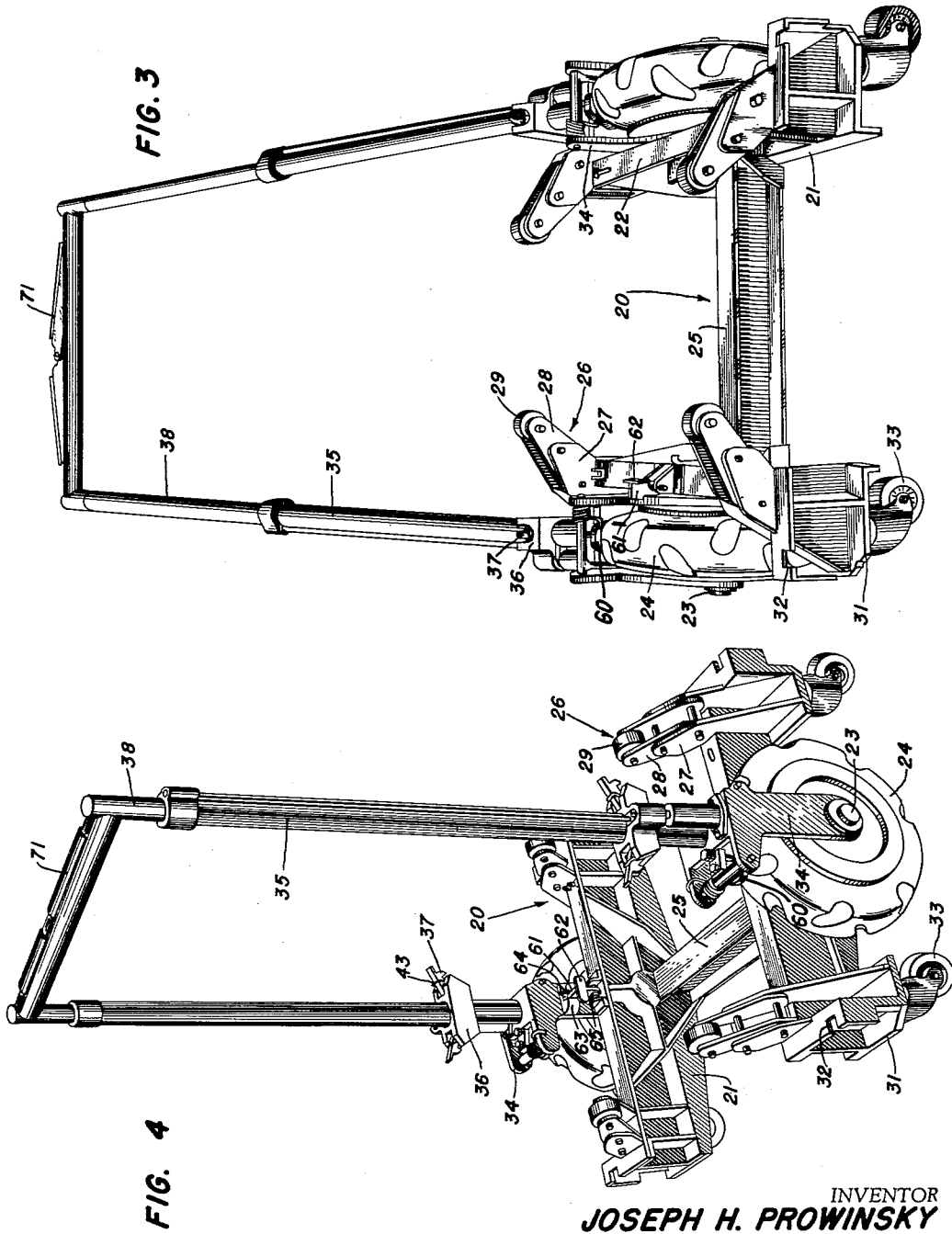
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4 Sheets-Sheet 3



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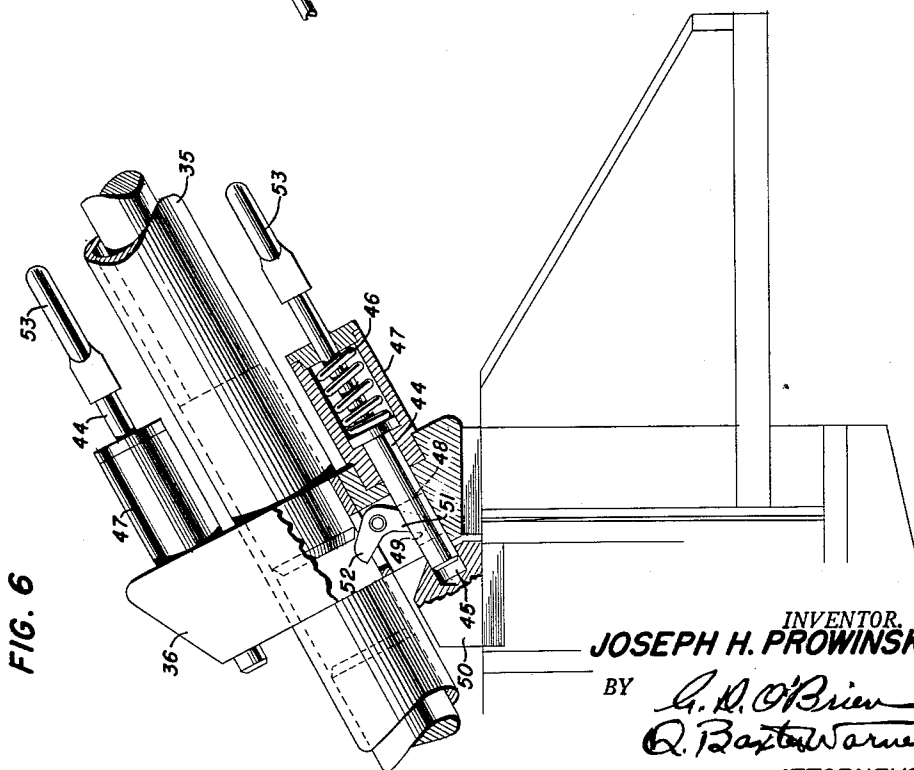
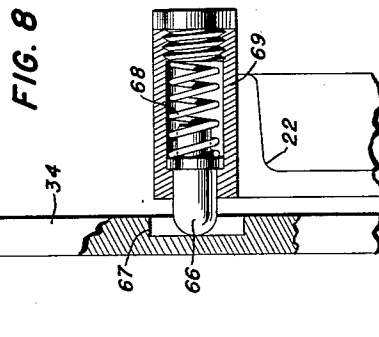
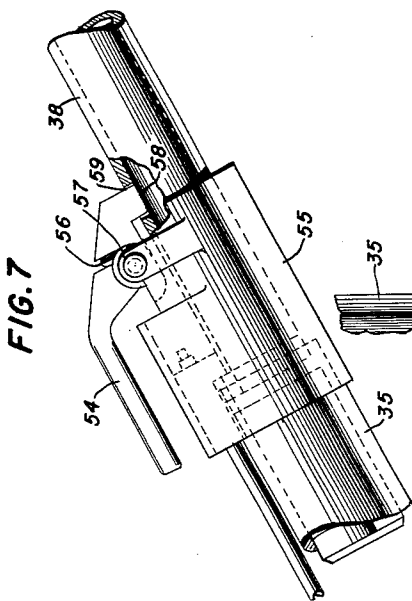
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4 Sheets-Sheet 4



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**LOAD HANDLING WHEELED SKID**

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Application February 6, 1953, Serial No. 335,609

20 Claims. (Cl. 280—47.16)

(Granted under Title 35, U. S. Code (1952), sec. 266)

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.

The present invention relates to a load handling apparatus and more particularly to a wheeled skid or auxiliary carriage for moving a load such, for example, as a bomb from a place of storage to a position where a high lift truck is located for a hoisting operation. The lift truck with which the present invention is specifically intended to be used is disclosed and claimed in my copending application, filed February 3, 1943, Serial No. 334,990. It is to be understood however, that the skid disclosed herein may be employed with lift trucks of any other type if so desired.

It has been the practice in the transporting of bombs or other loads across the flight deck of an aircraft carrier for subsequent transfer of the load to a high lift truck to employ one of two types of skids.

One of the two types of skids in prior use has been employed in conjunction with a lift truck having a load supporting saddle located forward of a full length rear axle. This combination of skid and lift truck equipment has not proved to be satisfactory under all conditions of service for the reason that separate hoisting means are required to transfer the load from the skid to the truck. Such a disadvantage is particularly serious on the flight deck of an aircraft carrier and in other locations where there is a minimum of free space and all equipment employed must be of the utmost compactness consistent with desired operations. Also, strict regulation and control of movement and positioning of all equipment must be constantly maintained on the flight deck of an aircraft carrier which renders the use of separate hoisting means to effect a skid-to-truck load transfer quite objectionable. In addition, numerous separate hoist devices are required when several aircraft are to be loaded on short notice.

The other type of skid in prior use on aircraft carriers was designed specifically for use with a lift truck having a U-shaped lifting structure which provided for entry and attachment of a loaded skid to the open ends of the lifting structure whereupon both the skid and the load were lifted to the desired elevation. Lifting the load and skid together has not proved to be satisfactory for loading bomb bays of aircraft because of the impossibility of moving the bomb near enough to the bomb shackles to be secured. In addition, small clearances of areas into which the load must be lifted and secured present considerable difficulties when both the skid and load are elevated into the bomb bays. Further, lifting the skid and load together prevents adjustment of the load on the skid to enable the bomb to be secured to the bomb bay shackles. Experience has indicated that a high lift truck having a load supporting assembly equipped with a rectangular shaped saddle which is narrower than the smallest diameter bomb to be handled and on which only the bomb is secured is the most advantageous and practical type of truck for loading all types of aircraft.

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Therefore, in order to hoist the bomb load into the bomb bay of an aircraft it frequently has been necessary to resort to the use of separate hoisting means to transfer the load from this prior type skid to a lift truck. In addition, lifting the skid and load together prevents the skid from returning to the magazines for another load until the hoisting operation is completed.

The skid of the present invention contemplates a construction whereby the load is carried and maintained at a fixed height above the deck and which provides space immediately beneath the load within which the load supporting assembly of an appropriate lift truck may be received and the load lifted directly from the skid by the lift truck without additional hoisting means being required to effect the skid-to-truck transfer.

Accordingly, it is an object of this invention to provide a skid having an arrangement of load supporting members which will support a load in such a manner as to permit the introduction of the lift structure of a high lift truck to a position directly beneath the load in which position the lift structure may be elevated to lift the load off the skid without necessitating the employment of additional hoisting equipment.

Another object resides in the provision of a skid having substantially an H-shaped frame and means for supporting a load in spaced relationship to the frame in such a manner as to permit the introduction of the load supporting assembly of a high lift truck directly between the load and the frame for hoisting the load off the skid without additional hoisting equipment.

An additional object of the present invention resides in the provision of a skid mounted on a pair of main wheels with a plurality of casters on each side of the main wheels, the casters being suspended above the deck when the longitudinal axis of the skid frame is parallel to the deck.

Yet another object is the provision of an extensible handle which may be lengthened or shortened in accordance with maneuverability and adjacent space requirements.

It is a still further object of this invention to provide a skid having a handle which may be rotated about the axle of the skid and latched to the frame at either end or at the center thereof without removing the load from the skid.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Fig. 1 is a longitudinal side elevation view of the skid including a fragmentary showing of a bomb load mounted thereon in accordance with the present invention;

Fig. 2 is a top plan view of the skid disclosing the H-shaped frame construction thereof;

Fig. 3 is a front end view in perspective of the skid of the present invention;

Fig. 4 is a somewhat reduced side perspective view of the skid with the extensible handle thereof positioned in the upright position for storage purposes;

Fig. 5 is an enlarged longitudinal sectional view of the mechanism employed by the present invention for releasing the handle from a latched position thereof and taken along a line substantially corresponding to line 5—5 in Fig. 2;

Fig. 6 is a fragmentary, longitudinal, side elevation view, partly in section of an alternative form of clasp means which may be employed for latching the handle to one or the other end of the skid and disclosing the manner in which the upper handle unlatches the clasp means as the handle means is telescoped;

Fig. 7 is a fragmentary, longitudinal, side elevation

view of an alternative form of holding means for releasably retaining the handle in an extended position; and

Fig. 8 is a longitudinal side elevation view, partly in section, of a modified form of pawl means for retaining the handle in a vertical position.

Referring now to the drawings wherein like reference numerals designate like parts throughout the several views, it will be observed that the skid of the present invention comprises a novel load supporting assembly generally designated by the reference numeral 20.

The present invention employs a frame 21 of generally H-shaped construction, as is best disclosed in Fig. 2. The frame 21 comprises a pair of longitudinally extending side members 22, which may be of channelled construction. Each member 22 is provided with stub axle 23 and wheel 24. The side members 22 are connected to one another at substantially the midpoint thereof by a crossbar 25 which may be of I-beam construction if so desired.

Although the frame 21 presents substantially an H-shaped appearance in plan view, as in Fig. 2, it will be observed from an inspection of Figs. 3 and 4 that the I-beam crossbar 25 is mounted below the longitudinal axis of each side member 22 thereby providing a recessed central portion which extends the entire width and length of the skid. It will thus be understood that a frame is provided which, in cooperation with certain other structure next to be described, permits the load supporting assembly of a high lift truck to be received from either end of the frame beneath the load and yet above the frame.

Each side member 22 is provided at each end thereof with a load supporting roller and bracket assembly generally designated by the reference numeral 26. Each bracket assembly 26 comprises upstanding supporting members 27 rigidly secured to side members 22 in any manner found suitable for the purpose such, for example, as by welding. In addition, a pair of spaced laterally extending arms 28 are adjustably connected by any means found suitable for the purpose such, for example, as by pins to each of the members 27 at the upper end portion thereof. Each pair of arms 28 is provided with a rotatably mounted roller 29 at the inner end thereof, as viewed in Fig. 2.

It will be apparent that this arrangement of the side channel members 22, the crossbar and the provision of the upstanding load supporting roller and bracket assemblies 26 provides a structure upon which a load can be supported with a considerable clearance between the upper flange of crossbar 25 and the underside of the load. The provision of such a clearance thus provides a space within which the load supporting assembly of a lift truck may be received from either end of the skid. It thus will be understood that the structure of the present skid permits the load to be lifted directly off the skid by the lift truck without the necessity of using a separate hoisting device to transfer the load from the skid to the truck. A laterally extending mounting bracket 31 is rigidly secured to each end of side members 22. The mounting brackets 31 provide additional support for the upstanding mounting members 27 which may be welded or bolted to the brackets 31. The laterally extending bracket members 31 may be of channel construction as shown in the drawings wherein the upper flange portion thereof is provided with a slot 32 for a purpose to be described later. A caster 33, Figs. 3 and 4, is pivotally carried by the undersurface of each bracket member 31 in such a manner that when the longitudinal axis of the skid is parallel with the surface upon which the skid rests all casters 33 are suspended above the surface. Thus, it will be appreciated that the four caster units 33 of the skid are mounted in such a manner that when the pair at one end of the skid are resting upon the supporting surface for the skid such, for example, as the deck, the opposite pair will be suspended above the deck so as to permit clearance of obstacles such as the arresting and barrier cables which are stretched across the flight deck of an aircraft carrier.

The skid of the present invention is also provided with a telescoping loop type handle and latching apparatus of novel construction. As is best disclosed in Fig. 2, each stub axle 23 has a U-shaped handle supporting bracket 34 rotatably mounted thereon in such a manner as to embrace its respective wheel 24. Rigidly secured to the outer end surface of each U-shaped bracket is a lower, tubular handle member 35.

A clasp block 36 having a pair of clasp members 37 each provided with hook portions and pivotally secured thereto on either side of the clasp block is mounted near the lower end of each handle member 35 at such a position as to effect a latching engagement between the clasp members 37 and the slots 32 when the handle members 35 are rotated about the axles 23 so as to overlie one end or the other of the skid, as the case may be.

Telescopically received within the handle members 35 is a U-shaped handle member 38, a pair of detents 39 which are spring biased outwardly, being mounted on each of the lower end portions of handle member 38 so as to secure the U-shaped handle portion in an extended position.

A stub shaft or cylinder 40, best disclosed in Fig. 5, is secured to each of the inner ends of the upper handle member 38 and functions to release the clasp members 37 from the latched position thereby permitting the handle members 35 and 38 to be rotated about axles 23 and latched to the opposite end of the skid.

As will be apparent from an inspection of Fig. 5, when detents 39 are depressed and handle member 38 is fully telescoped within handle members 35, each stub shaft 40 engages fingers 41 on clasp members 37 to rotate the latched clasp member in a disengaging direction about pin 42 and in opposition to the action of spring 43. Rotation of latched clasp member 37 causes handle members 35 and 38 to be released from bracket members 31 whereupon the handle may be rotated slightly relative to axles 23 and then extended to permit springs 43 to return clasp members 37 to the latching position. Thus, it will be understood that when the handle has been rotated about axle 23 to the dotted line position indicated in Fig. 1, the pair of clasp members 37 which are opposite the clasp members formerly latching the handle to brackets 31 at the left-hand end of the skid, as viewed in Fig. 1, will latch the handle to brackets 31 at the right-hand end of the skid. It will be apparent that the novel construction of the handle and the cooperation thereof with the remainder of the skid renders the skid capable of extreme maneuverability and also conserves space when fully telescoped or collapsed and positioned for storage.

An alternative form of latching means is disclosed in Fig. 6 and includes plungers 44 which are each slidably mounted within the clasp block 36 and resiliently urged by any suitable means such as spring 46, for example, into a registering slot or recess 45 in an upstanding block 50 secured to the frame of the skid and is enclosed within a suitable housing 47 encircling plunger 44. Each plunger 44 is provided with a longitudinally extending slot 48 for retaining one end 49 of an L-shaped finger 51 pivotally connected at its knee to one of the interior walls of clasp block 36. The other end 52 of finger 51 extends into the lower tubular handle member 35. Plungers 44 are moved to the unlatched position either by telescoping the handle, as described in connection with Fig. 5, or manually by pull-loops 53 secured to the exposed ends of plungers 44.

Reference is now made to Fig. 7 wherein an alternative form of handle detent is illustrated and which may be more suitable, under certain conditions, than the detents 39 of Figs. 1 and 2 for retaining the handle in an extended position. A handle 54 is pivotally connected to mounting sleeve 55 which is rigidly secured to the lower handle member 35. A spring 56 carried on the pivot pin 57 resiliently urges the detent 58 into a slot 59 provided in each leg of the U-shaped upper handle

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member 38. Slot 59 is moved into alignment with detent 58 when the handle is extended.

When it is desired to prepare the skid for storage, the handle is fully telescoped so as to release the engaged clasp members 37. Then the handle is moved to a vertical position, as shown in Fig. 4, whereupon the pawl 61 of lever 62 rides along cam surface 63 until it reaches recess 64 provided therein and then the pawl is resiliently urged into recess 64 by any suitable resilient means such, for example, as spring 65.

Another form of retaining means for latching the handle in a vertical position is illustrated in Fig. 8 wherein a detent 66 is resiliently urged into recess 67, provided in the surface of the U-shaped bracket 34, by a spring 68 contained under compression within a cylinder 69 which is secured to side frame member 22. Recess 67 is so formed as to have a cam surfaced bottom in order that when the handle of the skid is grasped by the operator and pressure is exerted thereagainst, detent 66 will move out of recess 67 as the handle is moved away from a vertical position. However, the slope of the bottom of recess 67 is sufficient to prevent the handle of the skid from swinging out of the stowed position due to roll and pitch of the ship. It will be apparent that such a retaining means may be carried on one or both side frame members 22 whichever is found to be most desirable.

A type of brake control commonly known as a "dead-man" brake is provided for the skid and comprises levers 71 pivotally mounted on the crossbar of the U-shaped handle member 38 and resiliently biased to project outwardly and angularly from the crossbar, as is best shown in Fig. 2. When the operator of the skid grasps the crossbar of handle member 38 the levers 71 are depressed to thereby release the brakes. When the operator releases his grasp of the crossbar of handle member 38, the brake control levers 71 are urged outwardly by spring means, not shown, to thereby set the brakes as is shown in Fig. 1 by the engagement of a serrated block 60 with wheel 24. It will be understood that brakes of any suitable structure may be employed and that the specific brake mechanism forms no part of the present invention.

Any means suitable for the purpose may be employed for the purpose of securing load 72 to the skid such as by cables 73, for example, which may be "dogged down" at the free ends thereof in any convenient manner.

It will be understood by those skilled in the art that several alternate methods of construction are immediately apparent without departing from the scope of the present invention. One such alternate method of construction would be to provide suitable means on the skid for lowering the load onto another supporting structure. A second method of construction within the scope of the present invention would be to equip the skid with more than two main wheels. Still another alternate method of construction would be to change the plan view arrangement of the structural members from an H-shape to a U-shape which would permit the transfer of a load from the skid to a variety of types of other low supporting structures such, for example, as nonwheeled storage structures.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A skid for supporting a bomb load comprising a substantially horizontal frame, wheels journaled to said frame, outwardly extending bracket members secured to the ends of said frame, load supporting bracket assemblies carried by said frame, caster members carried by said bracket members, said caster members extending downwardly a distance less than the wheels whereby

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the skid may rock about the wheels, a handle bracket journaled about the transverse axis of each wheel, a telescopic handle means carried by said bracket, brake control means carried by said handle means, means for latching the handle in any of a plurality of positions, said latching means being actuated to the latching position when said handle means is moved to any one of said plurality of positions, and control means on said handle means for moving said latching means to an unlatched position in response to telescoping movement of said handle means.

2. A skid for supporting a bomb or other load comprising a pair of laterally spaced substantially horizontal side frame members, wheels journaled outwardly of the frame members and adjacent the transverse axis thereof, a transverse member interconnecting said frame members, laterally extending bracket members secured to the ends of said frame members, load supporting bracket assemblies carried by said frame and bracket members, load engaging rollers on said assemblies, caster members carried by said bracket members adjacent the ends thereof, said caster members extending downwardly a distance less than the wheels whereby the skid may rock about the wheels, a U-shaped bracket journaled about the transverse axis of each of the wheels, telescopic handle means carried by said bracket, brake control means carried by said handle means, means for retaining the handle in a substantially vertical position, means for latching the handle in an angular position at either side of said substantially vertical position, said latching means being actuated to the latching position when said handle means is moved to said angular position, and actuating means on said handle means for moving said latching means to an unlatched position in response to telescoping movement of said handle means.

3. A skid for supporting a load comprising a pair of spaced horizontal side frame members, stub axles extending outwardly from said frame members, each of said stub axles being entirely supported by the side frame member individual thereto wheels journaled on said stub axles outwardly of the frame members adjacent the transverse axis thereof, a laterally extending crossbar interconnecting the frame members below the transverse axis of the wheels, laterally extending bracket members secured to the ends of said frame members, inwardly projecting load supporting bracket assemblies carried by said frame and bracket members and having load supporting rollers thereon, caster members carried by said bracket members adjacent the ends thereof, said caster members extending downwardly a distance less than the wheels whereby the skid may rock about the wheels, a bracket journaled about the axis of each of the wheels, a brake member secured to said bracket, extensible handle means carried by said bracket, detent means for retaining the handle in extended position, brake control means carried by said handle means for controlling the setting of said brake member, latching means for retaining the handle in any of a plurality of adjusted positions.

4. A skid for supporting a load comprising a pair of spaced horizontal side frame members, stub axles extending outwardly from said frame members, each of said stub axles being entirely supported by the side frame members individual thereto wheels journaled on said stub axles outwardly of the frame members adjacent the transverse axis thereof, laterally extending bracket members secured to the ends of the frame members, load supporting bracket assemblies on said frame and bracket members, load rollers on said assemblies, casters carried by said bracket members adjacent the ends thereof, said casters extending downwardly a distance less than the wheels whereby the skid may rock about the wheels, a handle bracket journaled about the axis of each wheel, a brake member secured to said handle bracket, telescopic handle means carried by said handle bracket, said

handle means including a tubular member secured to said handle bracket, a member slidable in said tubular member, a detent for retaining the handle in an extended position, broke control means carried by said handle means for controlling the setting of said brake member, means for latching the handle in any of a plurality of adjusted positions, said latching means being actuated to the latching position when said handle means is moved to said angular position, and actuating means on said handle means for moving said latching means to an unlatched position in response to telescoping movement of said handle means.

5. A skid for supporting a load comprising a pair of spaced substantially horizontal side frame members, laterally extending bracket members secured to the ends of said frame members, upwardly and inwardly extending load supporting bracket assemblies carried by said frame and bracket members, wheels journaled to the frame members, a bracket journaled about the transverse axis of each wheel, brake means secured to said bracket means, an extensible handle carried by said bracket, said handle comprising a first member rigidly secured to said bracket, a second member slidably mounted for extension relative to said first member, detent means for securing said second member in extended position, latching means carried by said first member of said handle and actuated to the latching position when said handle means and said bracket are moved to any one of a plurality of positions, and control means on said handle means for moving said latching means to an unlatched position in response to telescoping movement of said handle means.

6. The skid as defined in claim 1 wherein said handle means comprises a first tubular member rigidly secured to said handle bracket, and a second member telescopically received within said first member and including a plurality of detents carried by the inner end portion of the second member and resiliently biased in a laterally outward direction, said detents being disposed for end abutting relation with said first member to maintain extension of said handle means.

7. The skid of claim 6 wherein said second member further includes means secured to the inner end thereof for releasing elements of said latching means whereby the handle may be rotated about the transverse axis of each wheel.

8. The skid as defined in claim 1 wherein said handle means comprises a first tubular member rigidly secured to said handle bracket, a second member telescopically received within said first tubular member, a spring biased detent insertable into a slot provided in said second member when said handle is extended.

9. A skid as defined in claim 2 wherein said transverse member is positioned below the transverse axis of each wheel to thereby provide substantial clearance between the load and the transverse member.

10. A skid as defined in claim 2 wherein said means for retaining the handle in a substantially vertical position includes a recessed cam-surfaced plate secured to said U-shaped bracket, and a spring-biased pawl resiliently urged into said slot when the handle is in a vertical position.

11. A skid as defined in claim 2 wherein said means for retaining the handle in a substantially vertical position includes a detent, a sloping bottom surface of a recess defined by a portion of said U-shaped bracket, and resilient means for resiliently urging the detent into the recess.

12. A skid as defined in claim 2 wherein said means

for latching the handle in an angular position at either side of a substantially vertical position includes clasp members carried by said handle and resiliently biased in latching relation with said bracket members.

13. A skid as defined in claim 12 wherein each of said clasp members includes a finger partially disposed within said handle for engagement by said actuating means on said handle means when the latter is telescoped to thereby disengage said clasp members from said bracket members.

14. A skid as defined in claim 13 wherein each of said clasp members further includes a hook portion for latching engagement with one bracket member individual thereto.

15. A skid as defined in claim 13 wherein each of said clasp members further includes a plunger receivable within a recess and means for resiliently biasing said plunger into the recess.

16. A skid as defined in claim 3 wherein said latching means includes a pair of clasp members pivotally mounted on opposite sides of the lower portion of said handle means and resiliently biased to a latching position, each of said clasp members being provided with an inwardly projecting finger partially disposed within said handle means for actuation to an unlatched position by movement of means on said handle means as the latter is telescoped.

17. A skid as defined in claim 3 wherein said latching means includes means for unlatching the handle means from the bracket members as said handle means is telescoped.

18. A skid as defined in claim 4 wherein said actuating means comprises an engaging member secured to each end of said slidable member and disposed within said tubular member, and said latching means includes means resiliently biased in a latching position and having inwardly extending fingers partially disposed within said tubular member for actuation by said engaging member as said handle means is telescoped.

19. A skid as defined in claim 18 wherein said latching means further includes lever operated pawl means secured to one of said frame members resiliently biased to a latching position, means carried by one of said handle brackets for latching engagement with said pawl means, and means for disengaging said pawl means from the means carried by the handle brackets.

20. A skid as defined in claim 18 wherein said latching means further includes a detent resiliently biased into a recess provided within the side wall of each of said handle brackets; and a sloping bottom wall for said recess whereby the handle is maintained in a substantially vertical position until sufficient force is applied to the handle to cause the detent to ride along the sloping bottom and out of the recess.

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