United States Patent [19]

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[45] **Aug. 27, 1974**

[54] **PLATFORM SYSTEM FOR SERVICING AIRCRAFT LANDING GEAR**

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[21] Appl. No.: **164,301**

[52] **U.S. Cl.** ..... **187/8.41,** 187/8.45, 187/8.54, 187/8.72, 254/89 R

[51] **Int. Cl.** **B66f 7/00**

[58] **Field of Search** 187/8.41, 8.43, 8.45, 8.54, 187/8.71, 8.72, 8.62, 32, 33; 254/17, 1, 89, 93

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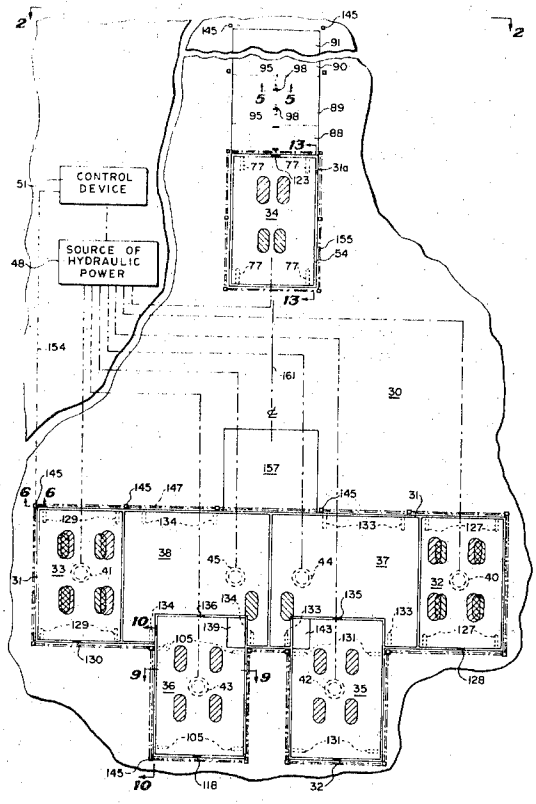
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[57] **ABSTRACT**

The floor of a servicing bay for large aircraft includes a plurality of wheel support platforms. There is a left wing gear platform, a right wing gear platform, two clearance platforms between the wing platform and each adjacent a respective wing gear platform, two body gear platforms extending rearwardly from the clearance platforms and a nose gear platform spaced forwardly from the two clearance platforms. The nose gear platform is on a scissors lift powered by a hydraulic ram. This scissors lift is on a carriage movable in a pit extending longitudinally of the aircraft. The remaining platforms are all supported on vertical hydraulic rams fixedly mounted approximately under the load centers of the respective platforms. Transfer sections are positioned between juxtaposed portions of the respective clearance platform and body gear platform. These transfer sections may be attached either to the clearance platform or the body gear platform and thus provide interchangeability to accommodate various types of aircraft. On each platform are a number of locks which engage vertically fixed portions adjacent the platform to prevent vertical movement of the platforms when the locks are engaged. The locks may be disengaged for vertical movement by the rams.

10 Claims, 13 Drawing Figures



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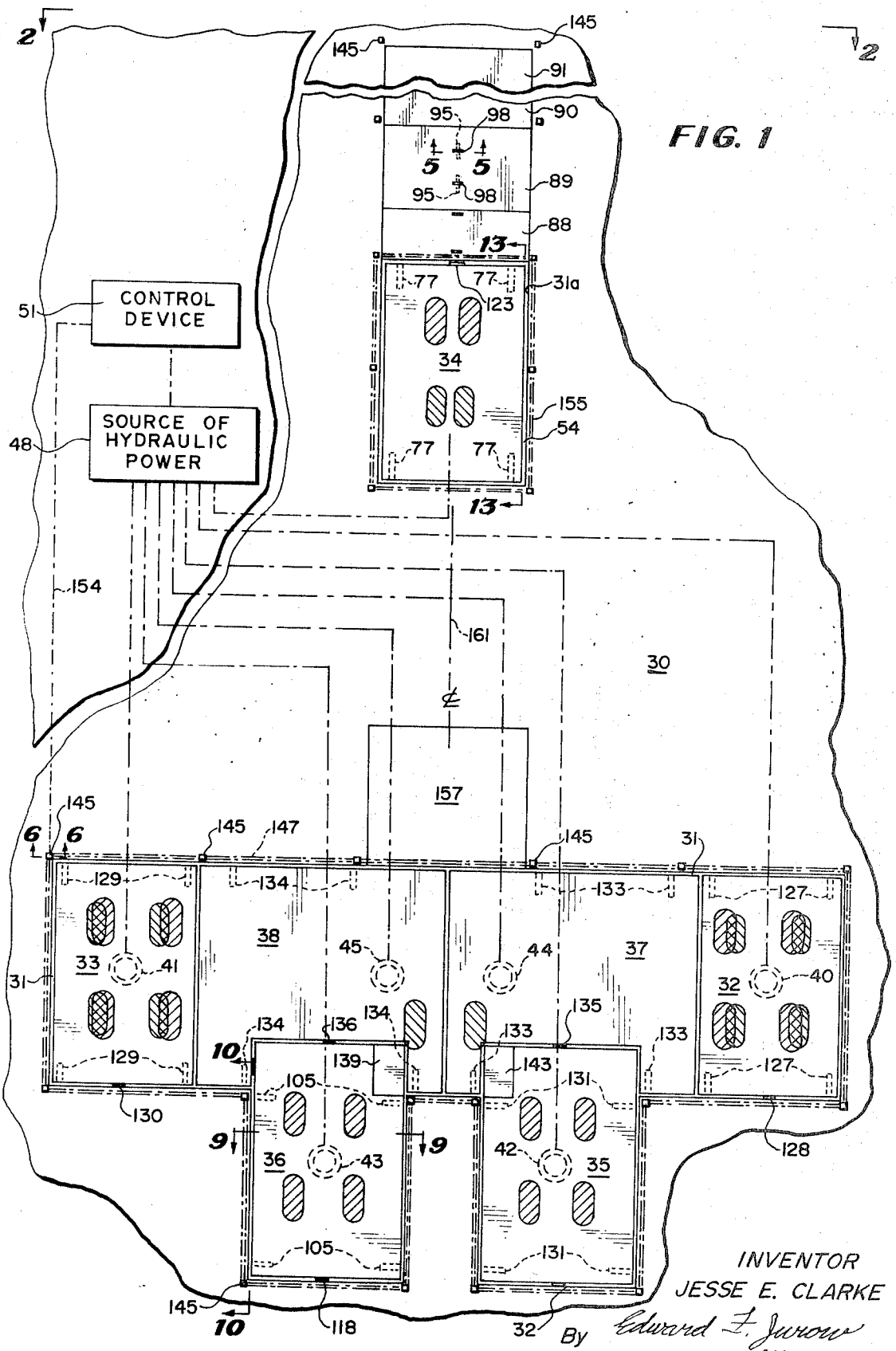


FIG. 1

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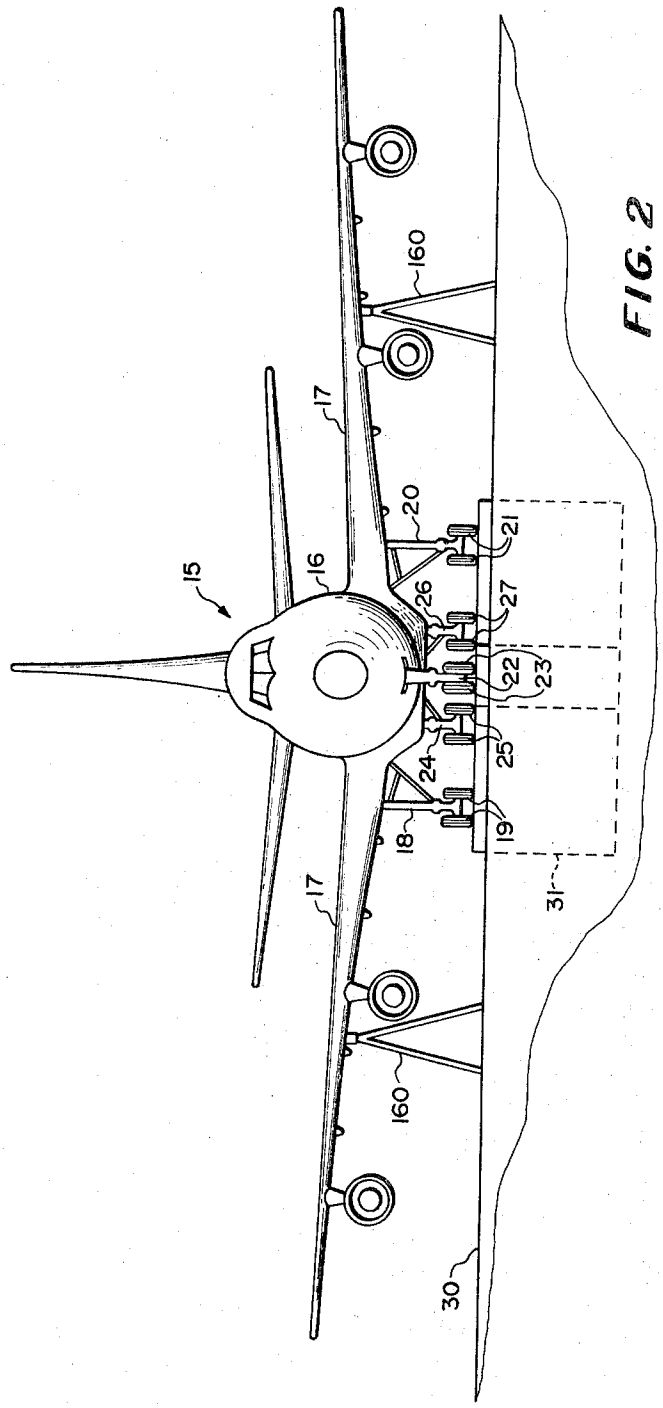


FIG. 2

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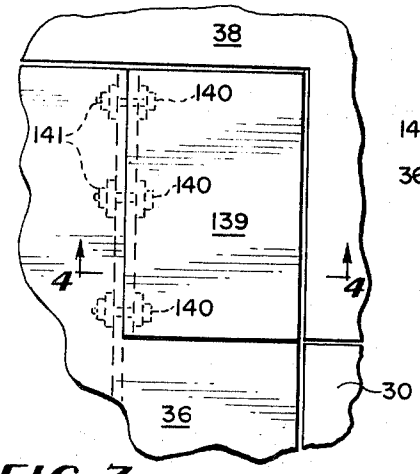


FIG. 3

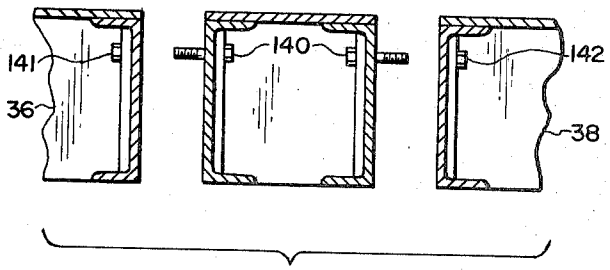


FIG. 4

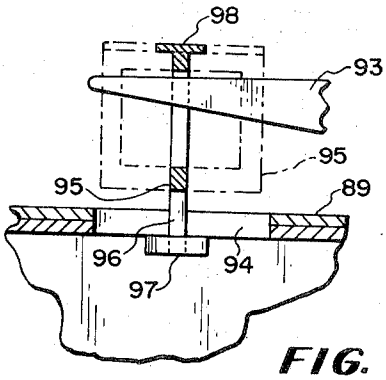


FIG. 5

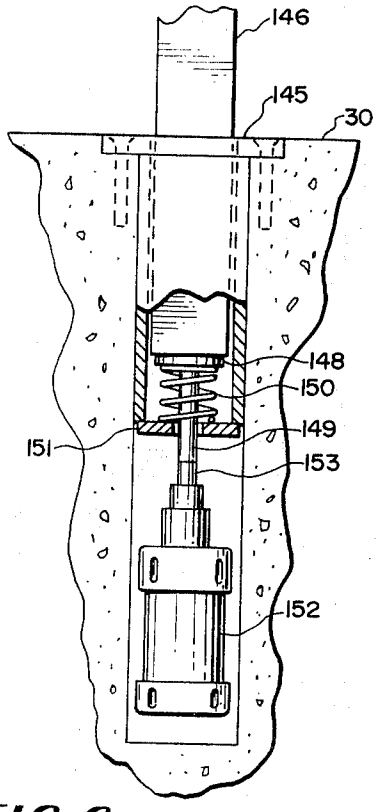


FIG. 6

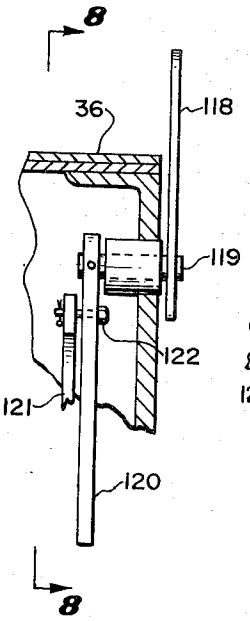


FIG. 7

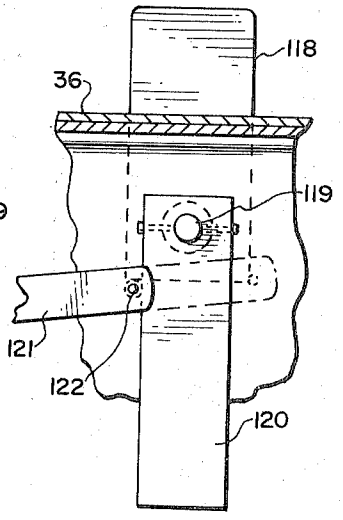


FIG. 8

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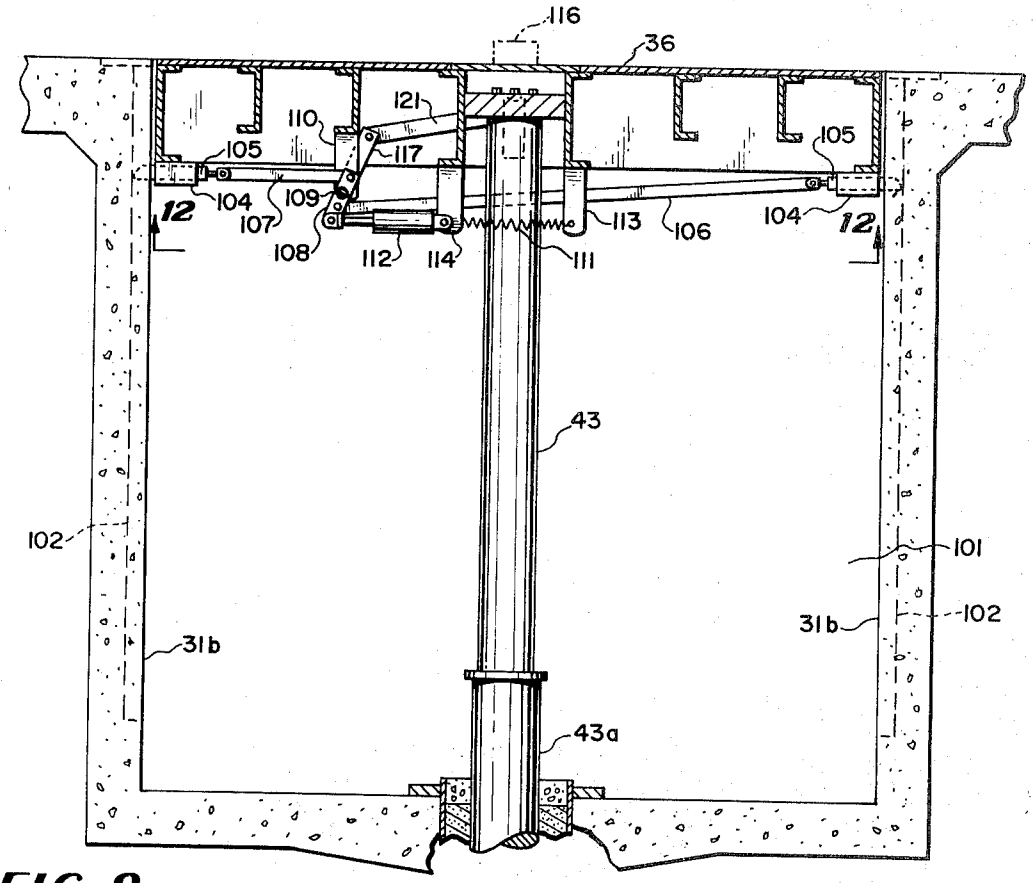


FIG. 9

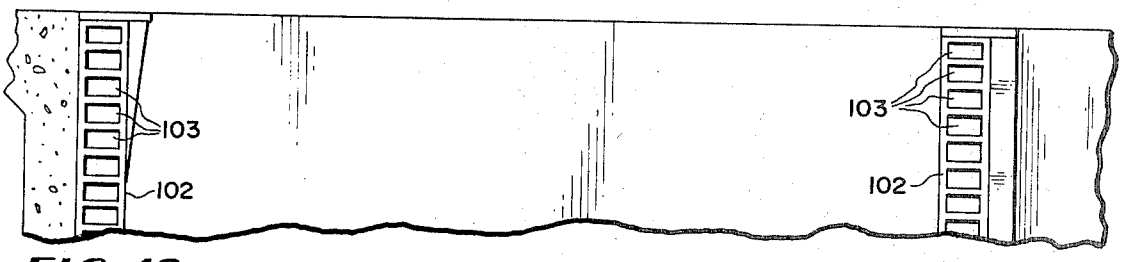


FIG. 10

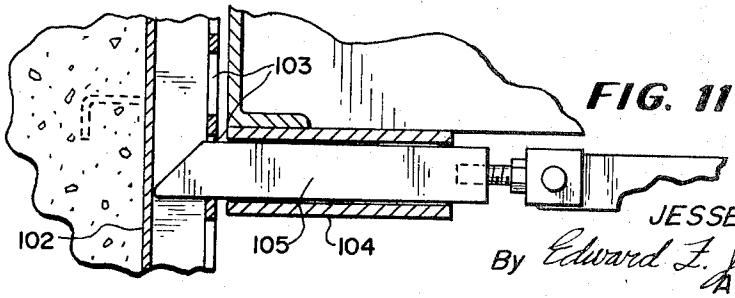


FIG. 11

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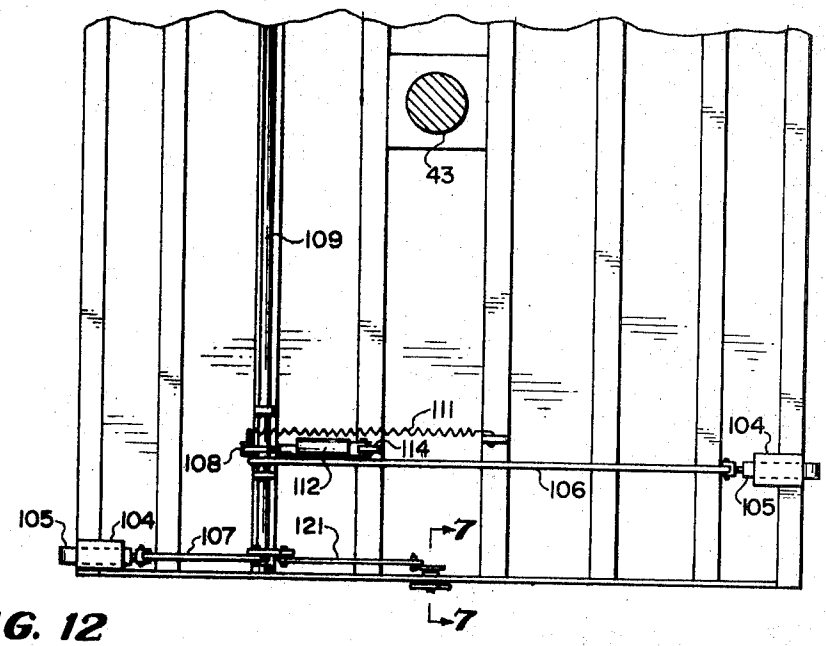


FIG. 12

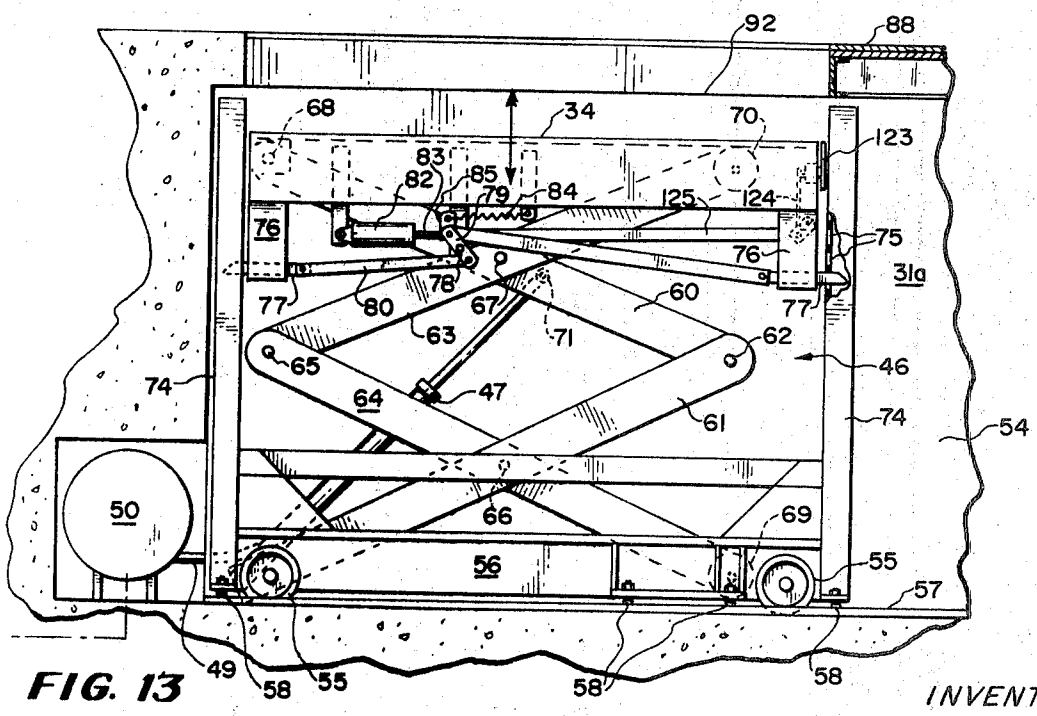


FIG. 13

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PLATFORM SYSTEM FOR SERVICING AIRCRAFT LANDING GEAR

BACKGROUND AND SUMMARY OF THE INVENTION

The present invention relates to a method and apparatus for facilitating the servicing of large aircraft, particularly the 747 and the DC-10.

Previously it had been the practice, when it was necessary to service all or a part of the undercarriages of the aircraft, to raise the aircraft with jacks so that the aircraft frame would remain stable and the undercarriages or portions thereof could be moved freely in the course of the servicing operation. As applied to the 747 and the DC-10, such a servicing procedure had a number of undesirable aspects. For example, the hangar in which the servicing was to take place would be required to have approximately an additional ten feet of head space. This is costly. Another factor would be that the aircraft would be at a different elevation when the undercarriage was to be serviced than it would be at those times when it was not necessary to service the undercarriage. Servicing operations, as for example on the engines, require platforms from which the workers can operate. This would mean that the platforms would be required to accommodate several elevations of aircraft, thus increasing the intricacy of such servicing structures, and their expense. Utilizing the present invention, the aircraft is always at about the same elevation in the servicing bay when it is being serviced, whether or not the undercarriage is being serviced at that time.

Another problem that is solved by the present invention, is that of adaptability to different types of aircraft. The aircraft vary as to the relative position of the wheels with respect to each other. Even, among the same general models, there are "stretched out" versions, with the result that the nose wheels are at a greater distance from the remainder of the undercarriage than in the sister ships. When different types of aircraft are compared, there are, of course, likely to be greater differences. Thus, for example, in the 747 the wheels of the body undercarriage are rearwardly of a line between the wheels of the two wing undercarriages, while in the DC-10 the body undercarriages are directly in line with the wing undercarriages. The aircraft operator is desirous of having his service facilities accommodate as many as possible of the varieties of aircraft. Obviously, this increases the usability of the service facilities and, since they are expensive installations, it is important that they be kept fully utilized.

This leads to another consideration, and that is, the matter of cost. It is important that the equipment be adequate to do the job, but, because it is quite expensive in any event, it is necessary that it not be "over designed," i.e., be any more lavish or expensive than is actually necessary. In the present invention, a very significant cost saving is achieved by having the lifting rams of such a character and so positioned that, in essence, they need only perform a lifting operation. They need not resist the high torsional loads that will exist when an aircraft is being moved on or off the lifting platforms for example. Locking means, engaging vertical wall portions are employed to hold the platforms in place except when the platforms are actually being used for vertical movement. These locking devices are comparatively inexpensive and will do an extremely effective job in holding the platforms stable against torsional loads or the like. Also, this permits the use of smaller supporting rams (or perhaps also fewer supporting rams) and thereby effects a cost saving.

Further objects and advantages will become apparent from the following description taken in conjunction with the drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of an embodiment of the invention;

FIG. 2 is a front view of a large aircraft positioned on the embodiment of FIG. 1 as seen at line 2—2 of FIG. 1;

FIG. 3 is a fragmentary plan view of a transfer section movable between the body platform and the clearance platform;

FIG. 4 is an exploded view of the transfer section and platforms as seen at line 4—4 of FIG. 3;

FIG. 5 is a partial section as seen at line 5—5 of FIG. 1;

FIG. 6 is an enlarged fragmentary section as seen at line 6—6 of FIG. 1;

FIG. 7 is an enlarged partial section as seen at line 7—7 of FIG. 12;

FIG. 8 is a partial section as seen at line 8—8 of FIG. 7;

FIG. 9 is an enlarged section as seen at line 9—9 of FIG. 1;

FIG. 10 is an elevational view of a wall as viewed at line 10—10 of FIG. 1;

FIG. 11 is an enlarged section showing the platform locking dog with the view generally corresponding to that of FIG. 9;

FIG. 12 is a fragmentary view as seen at line 12—12 of FIG. 9; and

FIG. 13 is an enlarged partial section as viewed at line 13—13 of FIG. 1.

DESCRIPTION OF SPECIFIC EMBODIMENT

The following disclosure is offered for public dissemination in return for the grant of a patent. Although it is detailed to ensure adequacy and aid understanding, this is not intended to prejudice that purpose of a patent which is to cover each new inventive concept therein no matter how others may later disguise it by variations in form or additions or further improvements. The claims at the end hereof are intended as the chief aid toward this purpose, as it is these that meet the requirement of pointing out the parts, improvements, or combinations in which the inventive concepts are found.

The present invention is for the purpose of servicing a large aircraft, generally **15.** It has a frame which includes a fuselage **16** and wings **17.** The undercarriage or running gear comprises a right wing undercarriage **18** having wheels **19,** a left wing undercarriage **20** having wheels **21,** a nose gear undercarriage **22** having wheels **23,** a right body (or fuselage) undercarriage **24** having wheels **25,** and a left body undercarriage **26** having wheels **27.** Of course, during flight, these undercarriages fold up within the frame of the aircraft. During servicing, it is often necessary to perform such folding operations to check on the operation of the apparatus involved, in addition to other servicing operations thereon.

Embodiments of the present invention will be installed in a large floor area **30**, presumably within a hangar. Vertical walls **31** extend downwardly from the floor and form a plurality of openings within which are a plurality of platforms, namely: a right wing gear platform **32**, a left wing gear platform **33**, a nose gear platform **34**, a right body gear platform **35**, a left body gear platform **36**, a right clearance platform **37**, and a left clearance platform **38**. Each of these platforms is moved vertically by a power means. Thus, in the illustrated embodiment the platforms **32**, **33** and **35** through **38** are mounted on and attached to vertical rams **40–45**, respectively. The platform **34** is carried on a scissors lift **46** actuated by a hydraulic ram **47**. The various rams are powered from a suitable source of power **48** to which each is connected as indicated by the dot-dash lines in FIG. **1**. Since, as hereinafter described, the ram **47** is on a movable carriage, the connection to it is made through a hose **49** held by an automatic reel **50**, as seen in FIG. **13**. Alternatively, in some embodiments, a subsidiary hydraulic power source will be mounted on the movable carriage that supports the ram **47**. The hydraulic power source **48** is controlled by a manually operable control device **51**. Thus, the rams can be operated singly or in various combinations, with certain automatic interlocks to prevent undesired operation, as hereinafter described.

The walls **31***a* defining the sides of the opening **54** for the nose gear platform **34** are elongated in the direction of the longitudinal axis of the aircraft when it is positioned on the various platforms. This is for the purpose of accommodating aircraft of different lengths. The scissors lift **46** thus is mounted on a carriage comprising wheels **55** and a frame **56**. The wheels **55** ride on tracks **57** at the bottom of opening **54**. Depending from frame **56** are a plurality of support bolts **58** having heads which are immediately above the tracks **57**. The distance between these heads and the tracks is in the range of about 0.006 to 0.008 inches. Thus, with no load on platform **34** there is a space between the support bolts and the track so that the carriage can be moved back and forth along the track. However, when a substantial load (e.g., aircraft) is imposed on platform **34**, there is sufficient resiliency in the mountings for wheels **55** so that the bolts **58** settle onto the track **57** to carry the weight directly to the track and to prevent movement of the carriage along the track.

The scissors lift **46** includes links **60** and **61** pivotally connected at **62** and links **63** and **64** pivotally connected at **65**. Links **61** and **64** are pivotally connected at **66**. Links **60** and **63** are pivotally connected at **67**. The bottom end of link **61** is pivotally connected to frame **56**, the pivotal connection not being apparent. Link **60** is pivotally connected to platform **34** at **68**. The lower end of link **64** has a wheel **69** which rides on the bottom of frame **56**. Link **63** has a wheel **70** which rides on the underside of platform **34**. A second, corresponding set of links, pivotal connections and wheels are behind those illustrated in FIG. **13**. The two sets of links are connected by a cross member **71**. The upper end of ram **47** connects to this cross member and the lower end of the ram bears against the frame **56**. Thus, as the ram **47** is extended the platform **34** goes upwardly and when it is retracted the platform goes downwardly.

The frame **56** includes four uprights **74**. These uprights have a plurality of openings **75** (positioned in a vertical row on each upright) which define sockets. Depending from the bottom side of the platform **34** are four brackets **76**. These brackets have horizontal openings defining ways for dogs **77**. Thus, the dogs are movable longitudinally in the ways to enter or be retracted from the sockets defined by openings **75**. A shaft **78** is rotatably supported from platform **34**. This shaft carries a double crank **79** which is secured to the shaft. Links **80** and **81** are pivotally connected to the crank and to the dogs **77** to move the same in response to rotation of the shaft. A hydraulic cylinder **82** is pivotally supported from platform **34** and its piston rod is pivotally connected to the crank **79**. This provides the power for rotating the shaft **79** and moving the dog. A spring **84** connects the platform **34** and a crank **85** on shaft **78**. This arrangement is such that should the hydraulic cylinder **82** fail to operate, the dogs will be moved outwardly by the force of the spring to enter the sockets **75**.

In an actual embodiment, the length of the opening **54** was slightly less than 52 feet. Of this, the platform **34** occupied a length of about 12 feet. The remainder of the length is closed by a series of cover plates **88–91**, etc. These cover plates rest on a ledge **92** at opposite sides of the opening. In the actual embodiment mentioned, there were seven such cover plates of varying lengths. The smallest of these was 1 foot in length and the combination of lengths were such that the platform **34** could be positioned at any point, within 1 foot, along the length of the opening **54**.

To facilitate the handling of the cover plates they are provided with rings which can be engaged by the tines **93** of the fork of a fork lift truck. On the smaller plates there is only one such ring while on the larger plates there are two such rings to receive both tines of the fork lift truck. FIG. **5** best illustrates this arrangement. For each ring there is an elongated opening **94** through which the elongated ring **95** can pass when it is parallel to the opening. The ring is secured to a stem **96** which can rotate within opening **94**. A stop plate **97**, larger than the opening, is secured to the bottom of the stem. A cap **98**, also larger than opening **94**, prevents the ring from falling completely through and away from the cover plate. Normally the ring is below the cover plate with the cap **98** resting on the top of the cover plate and supporting the ring.

To use the ring it is raised through opening **94** (being necessarily parallel to the opening to permit this movement) and then turned 90° from its original position, as illustrated in solid lines in FIG. **5** and dotted lines in FIG. **1**. The tines **93** then can project through the two rings spaced the required distance apart. When the fork of the fork lift truck is raised, the lifting force is transmitted through stop plate **97** to the underside of the cover plate and the cover plate can then be raised and moved about as required. One procedure would be to remove the cover plates, roll the carriage of platform **34** along its track to the new opening, and then replace the cover plates about the platform. Another would be to lower the platform **34** below the underside of the cover plates and then move it to its new location either before or after the cover plates were rearranged about that location.

FIGS. **9-12** illustrate the structure of platform **36**, its ram **43** and associated components. Walls **31***b* form an opening **101** for the platform. The platform **36** is formed of a top plate and various structural members.

It is bolted to the ram 43, The barrel 43*a* of the ram is suitably mounted in the concrete base of the opening 101. Mounted in the walls 31*b* are a plurality of vertically elongated metal boxes 102 having openings 103 therein to define sockets. Depending from the platform 36 are four brackets 104 defining horizontal ways for dogs 105. The dogs are connected by links 106 and 107 to double crank 108 secured to shaft 109. Shaft 109 is journaled in hangers 110 of the platform frame. A spring 111 and a hydraulic cylinder 112 are also connected between the crank 108 and hangers 113, 114. The hydraulic cylinder is used to retract the dogs 105 against the resilient urging of spring 111.

A crank 117 is secured to shaft 109 to operate a signal flag 118. Referring particularly to FIGS. 7 and 8, the flag 118 is secured to a shaft 119. Shaft 119 is journaled in the frame of platform 36. A counterweight 120 is attached to the other end of shaft 119. A link 121 is pivotally mounted on a pin 122 secured to a side of the counterweight and is pivotally connected to crank 117 (the latter being seen in FIG. 9). The arrangement is such that when the dogs 105 are retracted from their sockets in wall plates 102, the signal flag is in the raised position illustrated in FIGS. 7 and 8. However, when the dogs project outwardly into their sockets, the crank 117 moves lever 121 to the dot-dash line position illustrated in FIG. 8 and, in this position, the flag is turned by shaft 119 so that it no longer projects above the platform. A similar flag arrangement is employed in connection with the platform 34. Here the flag 123 is operatively connected by links 124 and 125 to a crank on shaft 78 so that when the dogs are extended the flag is turned below the level of the platform, while if the dogs are retracted, the flag 123 projects above the level of the platform.

The remaining platforms all have corresponding sets of dogs and flags. Thus, platform 42 has four dogs 127 and a flag 128. Platform 33 has four dogs 129 and a flag 130. Platform 35 has four dogs 131 and a flag 132. Platforms 37 and 38 each have four dogs 133 and 134 and flags 135 and 136, respectively. The mechanisms for operating these generally correspond to that described in connection with platform 36.

The wing gear and clearance platforms are in a straight line transversely of the aircraft (i.e., at right angles to center line 161). The two clearance platforms 37 and 38 have a general U-shaped configuration (the U being inverted as FIG. 1 is viewed) so that the adjacent, forwardly ends (i.e., the ends at which flags 135 and 136 are located) of the body gear platforms 35 and 36 respectively nestle within the U. The U is deep enough to receive only a relatively small proportion of the length of the body gear platforms.

Platforms 36 and 38 have a portion that they share interchangeably, this being a transfer section 139. Three bolts 140 are illustrated in FIG. 3 holding this transfer section to the platform 36. These three bolts are threaded into fixed nuts 141 on platform 36. The adjacent portion of platform 38 has openings for a corresponding set of three bolts and has fixed nuts 142 behind the openings. If it is desired to move the transfer section from platform 36 to platform 38, the bolts 140 threaded into nuts 141 are loosened and a corresponding set of bolts 140 are threaded into the nuts 142 (or the same bolts are moved one at a time). Thereafter, the bolts threaded into nuts 141 are removed and the bolts threaded into nuts 142 are tightened. This pulls the transfer section over against the platform 38, making it a part of that platform, and frees it from platform 36. The amount of movement is on the order of about three-fourths inch. Platforms 35 and 37 correspondingly share a transfer section 143.

Provision is made for a safety railing about the openings in which platforms 32, 33 and 35–38 are received. Thus, there are a plurality of sockets 145 recessed in the floor 30, as best seen in FIG. 6. These floor sockets are each of a size to receive an upright post 146. These posts in conjunction with suitable railings (not shown) are erected to form a fence in the configuration indicated by dot-dash lines 147 in FIG. 1. The sockets have a pressure pad 148 which is secured to a vertically movable plunger 149. The plunger rests on a spring 150 which is supported on the bottom plate 151 of the socket. Below the plunger 149 is suitable control switch 152 (electrical or pneumatic) having an actuator 153. The arrangement is such that spring 150 pulls plunger 149 away from actuator 153 when the post 146 is not in the socket 145, but permits the plunger to descend and actuate the switch as a result of the weight of the post. The various switches 152 are connected to control device 51, as indicated by dotted line 154 in FIG. 1. The arrangement is such that the control device will be ineffective to apply hydraulic power to the rams when the safety fences are not in place. In an alternative embodiment the fence is arranged so that it must be put together in a given sequence and only the last post to be installed actuates a switch to permit operation of the control device.

Similar provision is made for a safety fence about platform 34. This may be done by a series of corresponding floor sockets 145 so positioned that a safety fence 155 can be erected at any point along opening 54. Alternatively the post mountings may be such that the fence and its interlocking controls are more an integral part of the platform 34 than the floor area about it.

In an actual embodiment, the hydraulic power source 48 and the major controls 51 were located in a pit immediately in front of the center of the two clearance platforms 37 and 38. This pit is shown in FIG. 1 as having a cover 157. The existence of this pit and its removable cover has an additional purpose which will be subsequently described. For convenience of illustration, in FIG. 1 the source 48 and the controls 51 are positioned elsewhere on the drawing.

In FIG. 1 the ovals which have diagonal lines thereon extending from upper right to lower left illustrate the relative wheel positions for the 747 aircraft. The ovals that have the diagonal lines running from upper left to lower right are the wheel positions for the DC-10 aircraft.

Assuming that a 747 is to be serviced, all of the platforms are brought to floor level and the dogs locked to prevent any movement of the platform. The carriage on which the platform 34 is mounted is moved along its path so that the top will be at a proper location to receive the nose wheel approximately in the forward-to-back center of the platform. This (the position of platform 34) is not necessarily the correct position for the wheel positions illustrated in FIG. 1. The transfer platforms 139 and 143 are affixed to the body platforms 36 and 35, respectively. The aircraft is then run onto the platforms on its own wheels. Care is taken to center the aircraft so that the load centers of each of the under-

carriages are as near as possible over the vertical center line of the respective vertical rams 40–43. When the aircraft is properly centered, the protective fences 147 and 155 are erected.

The control device 51 is then operated to cause the source of hydraulic power 48 to apply hydraulic fluid to the rams sufficient to raise the respective platforms about 1 foot above the floor. In a specific embodiment the platforms could be moved from about 1.5 feet above the floor to about 8.5 feet below the floor. With the aircraft so raised (as illustrated in (FIG. 2) suitable supports, such as jack stands 160, are placed under the appropriate bearing points on the aircraft frame. These will now support the aircraft and the platforms are lowered to the desired elevation below the floor for servicing. Upon the completion of the lowering of the platforms, the hydraulic cylinders actuating the dogs are operated to extend the dogs and lock the platforms in place.

While, in the servicing of a 747 the clearance platforms 37 and 38 carry no part of the weight of the aircraft, they are necessary to provide space below the floor for the swinging movement of the various undercarriages. Thus, the wing undercarriages move toward the longitudinal center line 161 of the aircraft as they are being retracted.

When the servicing is complete, the dogs are withdrawn from their sockets. This causes the warning signal flags to be extended. The platforms are then elevated sufficently to remove the weight of the aircraft from the jack stands 160. The jack stands are removed and the platforms then are returned to floor level. At this point the warning flags, e.g., 118, 132, etc., are still extended signifying that the aircraft should not be moved horizontally until the dogs are reseated in their sockets. When the dogs are reseated in their sockets by the operation of the hydraulic cylinders, e.g., 112 and 82, the warning flags are retracted below floor level. The safety fences are picked up and moved out of the way. The aircraft then can be rolled off of the platform.

If a DC-10 is to be serviced, the procedure is essentially the same except that initially, the transfer sections 139 and 143 are moved over to become a part of the clearance platforms 38 and 37 respectively. This is a simple operation of merely loosening the three bolts per section and tightening three bolts per section. Now, when the DC-10 is moved into place, the main body wheels (which are centered under the aircraft) are carried on the two transfer platforms 37 and 38. Thus, these transfer platforms now serve the function as the body undercarriage platforms. Also, it is necessary to remove the cover 157 from the power pit so as to provide space for retraction of the main body undercarriage.

The weight of these jumbo aircraft is substantial. As such an aircraft would be rolled onto and off the platforms, it would impose very severe torsional loads wanting to tip the platform downwardly where the load center of the undercarriage was located. In the present invention, these torsional loads are resisted by the dogs. It is not necessary that the hydraulic rams be anywhere near sufficiently large to carry the loads. During the vertical movements, when the dogs are unlocked, the load centers of the undercarriages are almost directly over the respective rams so that there is little, if any, torsional loading on the ram. The ram need only carry the vertical load of the aircraft.

The use of the transfer sections 139, 143 permit great versatility in handling aircraft with different undercarriage configurations. Also, the use of a scissors lift on a movable carriage as a mounting for the nose wheels platform additionally adds to the adaptability of the apparatus.

I claim:

1. In an apparatus for servicing large aircraft having a frame including wings and having undercarriages with wheels depending from said frame, there being a plurality of main undercarriages and a nose undercarriage, said wheels being positioned in a predetermined pattern, said apparatus including a floor area, walls defining vertical openings in said floor area which openings, in a horizontal plane, encompass said pattern, a plurality of platforms in said openings respectively, there being one such platform for each main undercarriage and a platform for the nose undercarriage, hydraulic ram means for each platform, positioned within the respective opening and below the respective platform, said ram means being operable to raise and lower the platform, the improvement comprising:

said power means including manually operable control means for dictating when the rams are to be raised and lowered, a plurality of vertical sockets in the floor area about said openings, fence means about said openings, and having posts releasably received in said vertical sockets, said control means including a sensor in at least one of said vertical sockets and having a first condition when there is a post in that socket and a second condition when there is not a post therein, said control means being ineffective to dictate the raising and lowering of the rams when the sensor is not in the first condition.

2. In an apparatus for servicing large aircraft having a frame including wings and having undercarriages with wheels depending from said frame, there being a plurality of main undercarriages and a nose undercarriage, said wheels being positioned in a predetermined pattern, said apparatus including a floor area, walls defining vertical openings in said floor area which openings, in a horizontal plane, encompass said pattern, a plurality of platforms in said openings respectively, there being one such platform for each main undercarriage and a platform for the nose undercarriage, and said main platforms defining specific locations thereon for the positioning of said main undercarriages, a vertically moving hydraulic ram for each main undercarriage platform, positioned within the respective opening and below the respective platform, said ram being secured to the underside of the respective platform and operable to raise and lower the platform, each said ram being below approximately the center of the load imposed on the respective platform by the respective main undercarriage positioned at the respective specific location, means including a hydraulic ram for vertically moving said nose undercarriage platform and being below and secured to the nose undercarriage platform, the improvement comprising:

the main undercarriage platforms comprising a left wing gear platform, a right wing gear platform, a first clearance platform between the wing gear platforms and adjacent the left wing gear platform, a second clearance platform between the wing gear

platforms and adjacent the right wing gear platform, said wing gear and clearance platforms being approximately in a straight line transversely of the aircraft, a left body gear platform having at least the main portion thereof rearwardly of the first clearance platform, and a right body gear platform having at least the main portion thereof rearwardly of the second clearance platform, the two clearance platforms having their inwardly ends immediately adjacent each other, each clearance platform having its rearwardly side with a generally U shaped configuration with the respective body gear platform having its forwardly end extending within said U, the forward inwardly corner of the body gear platform defining a transfer section, means detachably connecting said transfer section to the body gear platform whereby the transfer section may be released from the body gear platform, and means for detachably connecting the released transfer section to the respective clearance platform, whereby the clearance platforms may be used for supporting the body undercarriages of another form of aircraft.

3. An apparatus as set forth in claim **2** including a pit with a cover so located that the cover forms a part of the floor area immediately in front of the adjacent ends of the two clearance platforms.

4. An apparatus for servicing several types of large aircraft having a frame including wings and having undercarriages with wheels depending from said frame, there being a plurality of main undercarriages and a nose undercarriage, said wheels being positioned in a predetermined pattern, said apparatus comprising:

a floor area;

a plurality of supporting platforms recessed in said floor area, said platforms comprising a left wing gear platform, a right wing gear platform, a first clearance platform between the wing gear platforms and adjacent the left wing gear platform, a second clearance platform between the wing gear platforms and adjacent the right wing gear platform, said platforms being approximately in a straight line transversely of the aircraft, a left body gear platform having at leas the main portion thereof rearwardly of the first clearance platform, and a right body gear platform having at least the main portion thereof rearwardly of the second clearance platform, and a nose wheel platform spaced at some distance in front of said clearance platforms and movable forwardly and aft with respect to the clearance platforms, the two clearance platforms having their inwardly ends immediately adjacent each other, each clearance platform having its rearwardly side with a generally U shaped configuration with the respective body gear platform having its forwardly end extending within said U, the forwardly inwardly corner of the body gear platform defining a transfer section, means detachably connecting said transfer section to the body gear platform whereby the transfer section may be released from the body gear platform, and means for detachably connecting the released transfer section to the respective clearance platform, whereby the clearance platforms may be used for supporting the body undercarriages of another form of aircraft; and

power means connected to each of the platforms for raising and lowering the respective platform.

5. An apparatus as set forth in claim **4** including a pit with a cover so located that the cover forms a part of the floor area immediately in front of the adjacent ends of the two clearance platforms.

6. An apparatus as set forth in claim **4**, including walls extending downwardly from said floor area and defining an opening for receiving the nose wheel platform, the walls defining the opening being elongated in a direction parallel to the longitudinal axis of an aircraft whose main undercarriages are at said respective platforms;

a carriage located in said opening and movable parallel to said axis, said nose undercarriage platform being mounted on said undercarriage for movement therewith, said nose undercarraige platform occupying only a portion of the length of the opening; and

removable cover means for the remainder of the length of the opening.

7. An apparatus as set forth in claim **6**, wherein said carriage includes a frame, wheels on said frame for supporting the frame for said movement parallel to said axis, said frame having vertical portions with the nose platform being between said portions, said portions having vertical rows of sockets, dogs on said nose platform and aligned respectively with the rows of sockets on said portions, said dogs being movable to enter and retract from the sockets of the respective row, and power means connected to the latter dogs for so moving said dogs.

8. An apparatus as set forth in claim **7**, wherein the power means for the nose platform includes a scissors lift mounted on the carriage frame, said nose platform being mounted on the top of the scissors lift.

9. An apparatus for use with a fork lift truck having a fork with a pair of tines spaced a given distance apart and as set forth in claim **6**, wherein the removable cover means has a pair of links mounted on the top thereof, said links being movable with respect to the cover means between extended and retracted positions, said links, when in the extended positions, being spaced said distance apart and positioned to receive said tines so that the fork of the truck may be inserted therethrough and used to raise the cover means.

10. An apparatus as set forth in claim **4**, including means for defining an opening in the floor forwardly of the adjacent ends of the clearance platforms.

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