Sept. 23, 1947. G. W. MERRITT 2,427,802

FACILITY FOR PARKING AND GARAGING AIRPLANES

Filed Nov. 17, 1945 3 Sheets-Sheet 1

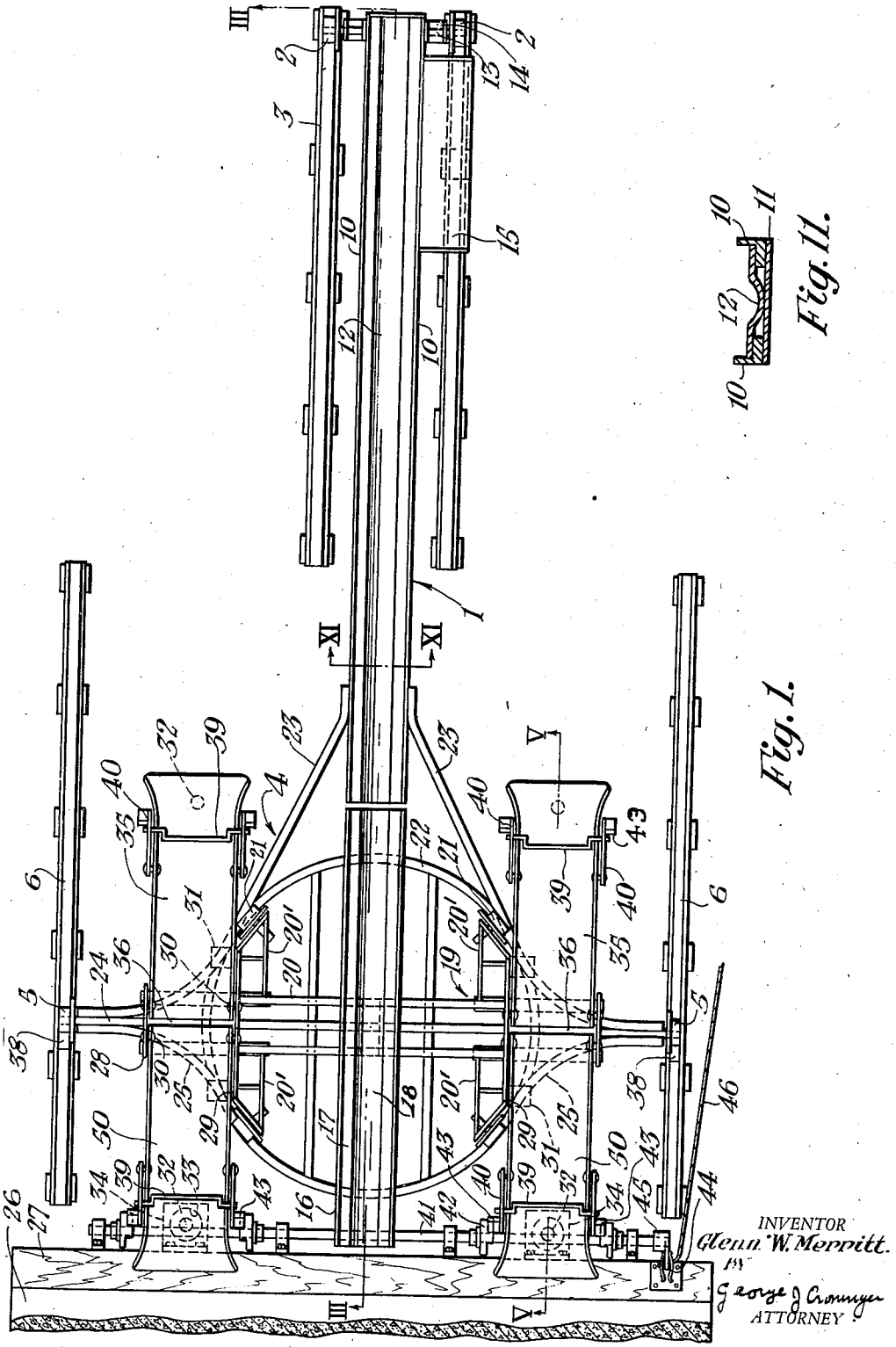


Fig. 1.

Fig. 11.

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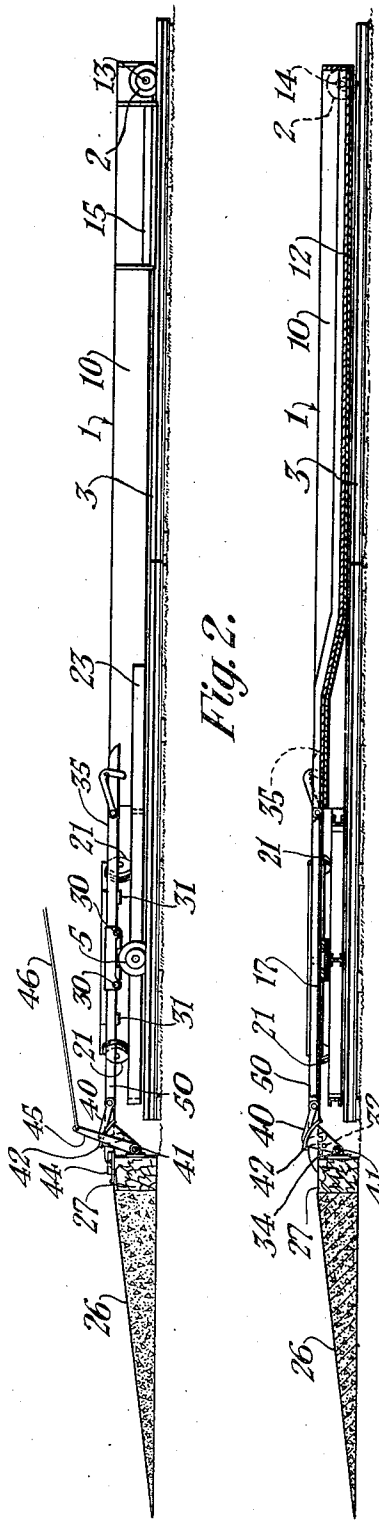


Fig. 2.

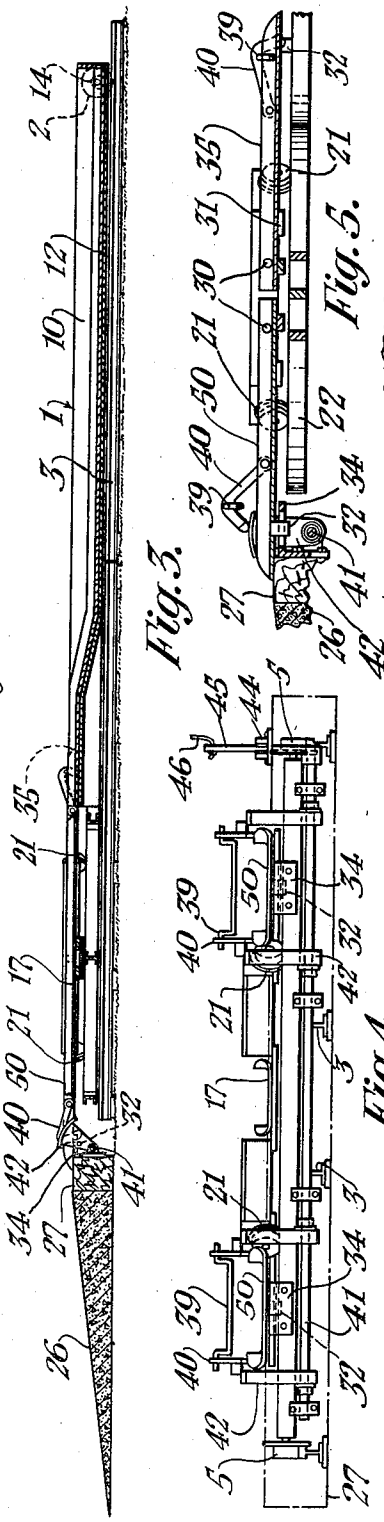


Fig. 3.

Fig. 5.

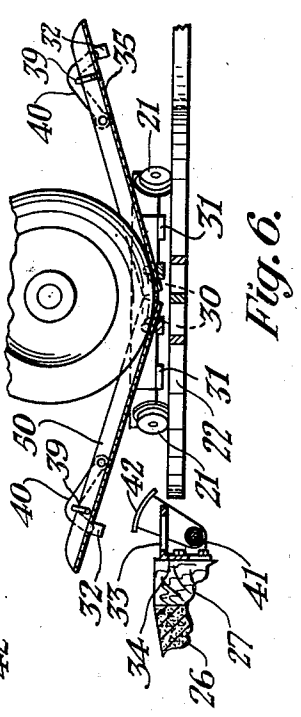


Fig. 6.

Fig. 4.

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Sept. 23, 1947. G. W. MERRITT 2,427,802

FACILITY FOR PARKING AND GARAGING AIRPLANES

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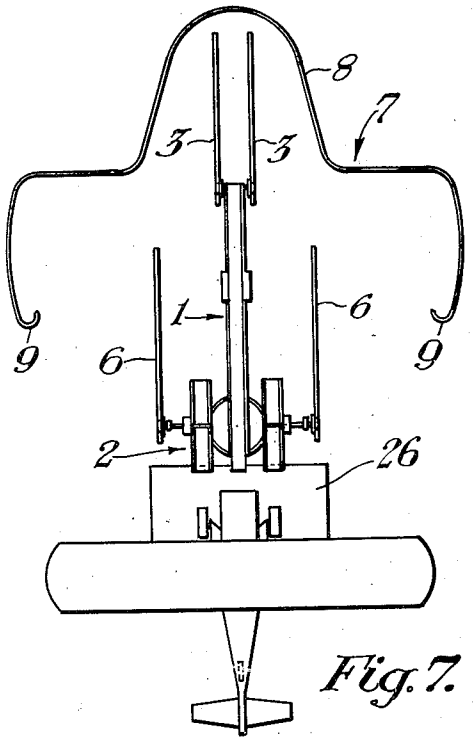


Fig. 7.

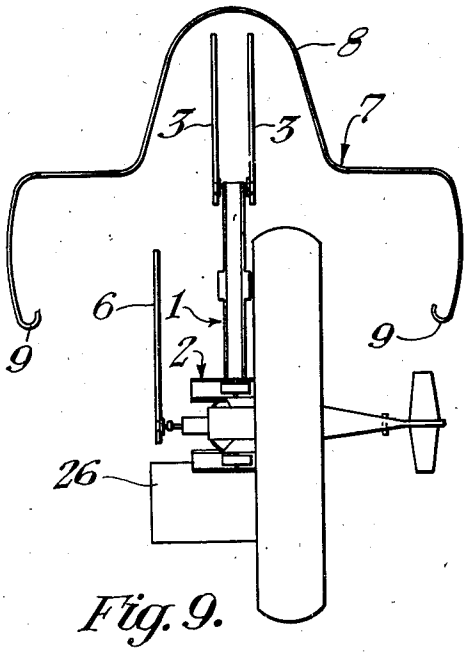


Fig. 9.

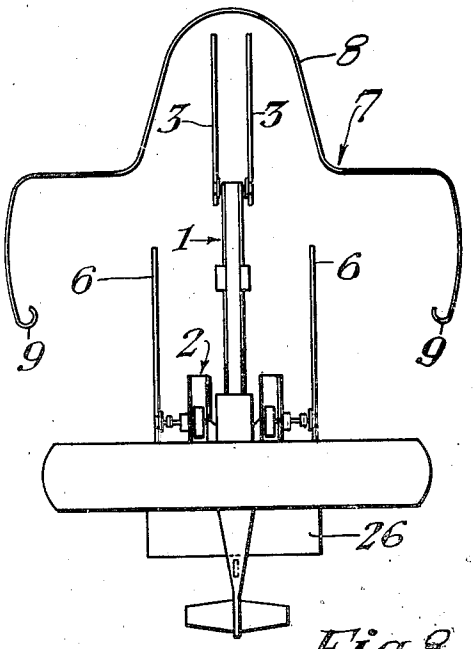


Fig. 8.

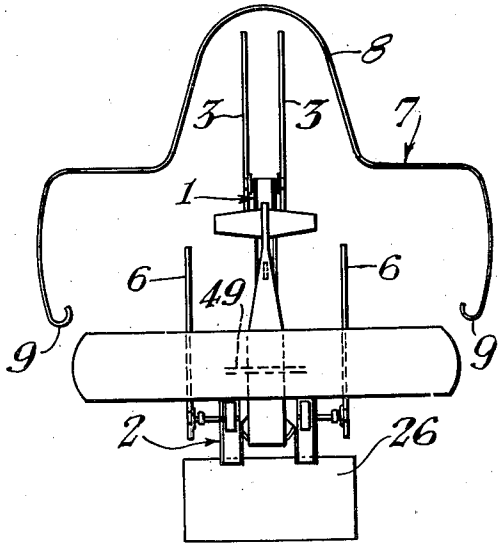


Fig. 10.

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FACILITY FOR PARKING AND GARAGING AIRPLANES

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Application November 17, 1945, Serial No. 629,289

10 Claims. (Cl. 214—16.1)

1

This invention relates to improvements in facilities for parking and garaging airplanes. It has to do particularly with apparatus by means of which planes may be safely parked, for instance for the purpose of starting the motor, turned around and carried into and out of a hangar. One of the advantageous features of the invention resides in the fact that the operations may be performed with ease and safety and without special knowledge or skill or the expenditure of much manual effort. The operations may be performed single handed and without need for assistance.

The present invention is especially adapted for use in conjunction with small, lightweight plane types and is intended to encourage private plane ownership and the use of private hangar facilities. It is a well known fact that considerable effort and skill are required to maneuver a plane by hand into or out of the narrow confines of a conventional T hangar, a design commonly used for housing small planes. It is seldom possible for an individual to do this or to start the motor of the plane without assistance. The object of this invention therefor, is to eliminate the skill, drudgery and need for assistance in parking, starting, turning and garaging planes and to provide simple, inexpensive apparatus easy to construct, install and operate to accomplish the purpose.

In accordance with this invention, the plane is carried into and out of the hangar on a mobile carriage supported on guide rails. Thus, there is no time lost maneuvering the wings through the narrow limits of the entrance doorway or guiding the tail section into the tail shed. The same holds true when the plane is being removed from the hangar. There is no danger of the plane rolling off the carriage while it is being transported from place to place, because the wheels are held against movement by certain novel apparatus. Also provided are means releasible by the occupant of the plane after the plane has been moved forward to the starting point for holding the plane against forward movement incident to starting the motor. This insures safety both in starting the plane motor when ready for the take-off and safety in transporting the plane from place to place on the carriage.

Other objects and advantageous features will be noted in the following detailed description and drawings wherein like reference characters designate like parts and wherein:

Figure 1 is a plan view of the preferred form of apparatus.

Figure 2 is a side elevation of the apparatus of Figure 1.

Figure 3 is a longitudinal section through the center of the apparatus of Figure 1.

Figure 4 is a front elevation of the apparatus of Figure 1.

2

Figure 5 is a detail turntable end of the apparatus showing a pair of ramps in lowered, plane receiving position.

Figure 6 is a view similar to that of Figure 5 showing the ramps in raised, wheel blocking position.

Figures 7, 8, 9 and 10 are diagrammatic views in plan illustrating, in successive views, how a plane is loaded onto the apparatus.

Figure 11 is a transverse section on line 11—11 of Figure 1.

With reference to Figures 1 to 4 inclusive, I provide a support for the plane in the form of a mobile carriage on which the plane is carried from place to place. Said carriage comprises generally a tail section 1 mounted and running on flanged wheels 2 on a narrow gauge track 3 and a turntable or front end section 4, joined to the tail section and running on flanged wheels 5 on a wide gauge track 6.

Where the apparatus is used in conjunction with a T-hangar, shown diagrammatically at 7 in Figure 7, the narrow gauge rails extend into the tail shed 8 from a position inside the hangar and the wide gauge rails run through the entrance of the hangar from a position far enough in advance to allow the plane to be turned on the carriage outside the hangar without interference between the wings and hangar frame. The clearance between the end walls 9 of the hangar and the wing tips may be reduced to a minimum because the plane is guided in its movement into the hangar with little or no lateral displacement. This enables the width of the hangar and the entrance opening to be held to a minimum thereby saving space and materials and reducing the overall cost of hangar construction.

The tail section 1 of the carriage forms a tail wheel runway and is designed to support the tail section of the plane. It also provides a floor over which the tail wheel may roll and be guided and has a side entrance by means of which access may easily be had to the floor. The tail section may, for instance, be formed of a pair of angles 10 arranged in spaced parallel relation and welded or otherwise secured to transverse plates 11. A metal or wooden plank 12 laid between the angles forms a suitable floor and the sides of the angles preferably extend thereabove as an added safety factor in case the tail wheel should fail to stay in the groove 12.

The wheels 2 are mounted on roller bearings on an axle 13 carried by axle housings 14 welded or otherwise secured to the rear end of the tail section frame. Access to the floor is obtained by side entrance served by an inclined ramp 15 whose upper end is flush with the top level of the floor 12 and whose lower end is almost flush with the ground beyond one of the rails. Any suitable method or means of rigidifying and strengthening the tail section may be employed

to prevent sag and permit the floor level to be positioned at a minimum elevation above ground level. In this way the inclination of the ramp can be held to a minimum to facilitate rolling the tail section of the plane thereonto. Of course, if desired, a stationary concrete ramp (not shown) or the like may be provided in place of the ramp attached to the tail section frame.

The tail wheel is carried over the front section 4 of the carriage, when the plane moves off the assembly, by a stationary runway section 16, open at both ends and formed with a floor 17 and tail wheel groove 18 contiguous with that of the tail section of the carriage. Runway 16 is secured to the turntable 19 and extends diametrically across the center thereof so that in loading or unloading position, the support 16 and tail section 1 will be properly aligned.

Turntable 19 may be of any suitable construction, however, is preferably formed of a pair of spaced channels 20 strongly braced across the ends and middle. Four roller frames 20' are secured in pairs on opposite sides of the center and each frame carries a flanged roller 21 which rests on a circular track 22. Joined to the outside of the track member 22 are braces 23 which extend back and are welded or otherwise secured to the tail section 1 thus making the two sections into one strong unit.

Across the center of the circular track is an axle 24 and for the sake of reducing overall height, either the axle or track may be notched out and welded together for strength. The wheels on which the turntable section of the carriage rides are carried at the opposite extremities of the axle which is further supported and strengthened by curved braces 25 welded or otherwise secured to the track and to the axle.

The plane is preferably run onto the turntable, Figure 7, from a permanent ramp 26 which may be of any suitable construction. It is preferably a concrete ramp having a long approach surface inclined at a low angle with a level surface immediately in front of the turntable at approximately the same level as the table pans to be later described. At the front end of the ramp is a timber 27 or a box section metal frame having a plane upper surface. Thus, as the plane is taxied up the ramp, the front wheels are brought to the level of the guide pans carried by the turntable onto which the plane wheels roll. The ramp 26 is preferably of such length that the caster wheel at the rear of the plane rests on the ground when the front wheels of the plane are resting on the center of the turntable. The purpose of this is to facilitate turning the plane around by hand which might be made somewhat difficult if there was a drop-off to contend with, although this circumstance could be remedied by sloping the sides of the ramp 26 or making it semi-circular at the approach end.

The front wheels of the plane are received on the turntable by runways comprising a pair of pans 50 carried by the turntable. These pans are pivotally supported on the table, but their movement is limited. To support them, a pair of bars 28 and 29, one long and one short, are welded or otherwise secured at right angles across the tops of the frame members 20 on opposite sides of the center of the turntable. The pans 50, which are preferably shallow channels provided with flared and downwardly inclined ends are pivotally supported by pins 30 inserted in holes in bars 28 and 29 or any other

suitable means. When the turntable is in plane receiving position, these pans are down or in horizontal position and they are held in this position by a plate or similar device 31 welded or secured to the bottom of the inside bar 29. In this position the leading ends of the pans normally rest on the timber 27 and to prevent endwise or angular movement of the frame, depending pins 32 secured to the undersides of the pans are received in oversize holes 33 in latch plates 34 firmly secured to and projecting from the timber or box section frame 27.

When the plane has moved to the center of the turntable, it is my intention to automatically stop the forward movement of the plane and lock it in position. I accomplish this in the following manner: Extending rearwardly from pans 50 are a pair of runway pans 35 constructed and supported in the same manner as pans 50. There is a slight gap 36 provided between the pans of a pair and when the wheels of a plane rest across these gaps the weight of a plane automatically raises them as shown in Figure 6, to thereby stop the plane and prevent the wheels from rolling further in either direction. As an added precaution, the pans may be propped in raised position by inserting a bar in the space between the pan and the bars 28—29, just ahead of pins 30.

The upward pivoted movement of both pans 50 and 35 is limited by contact with frame members 20, the pivot pins 30 being located high enough to allow for a small amount of clearance when the pans are level. Upward movement of the pans withdraws locking pins 32 from the holes 33 and releases the turntable for angular movement.

The plane is now in readiness to be turned, and this is done single handed by the plane operator who descends to the ground from the cockpit and with the plane in the position shown in Figure 8, pushes the tail of the plane around through a 180° arc and runs the caster wheel up onto the tail section of the carriage, see Figures 9 and 10. This operation may be accomplished in effortless fashion, because the turntable is mounted on roller bearings and frictional resistance is low. The plane is now ready to be moved backwards into the hangar and since the carriage will easily roll, the plane operator either pulls or pushes on the plane to roll the carriage into the hangar. The entire operation of garaging the plane can be accomplished in a very short period of time in an effortless and safe manner and with little more inconvenience than garaging a motor car.

To remove the plane from the hangar, the carriage is pushed forwardly by hand along the tracks. When the rear wheels 2 strike the bumper blocks 38 fastened to rails 6, the forward motion of the carriage is arrested, however, the inertia of the plane causes it to roll forward thereby forcing the pans in front of the wheels down and permitting the rear set of pans to drop by gravity to a horizontal position. The locking pins 32 on the front pans enter the holes 33 in the locking plates 34 to secure the turntable against angular movement and the carriage against backward movement.

To prevent the plane from rolling off the turntable and to hold it against forward motion whilst the motor is started, thereby to comply with safety regulations, each pan is provided with a wheel stop, Figures 1 to 6 inclusive, in the form of a cross rod 39 mounted on a pair of arms 40 pivoted on the outside of the pan. The cross rod

is offset so that in lowered position, Figure 2, it will rest in a depression in the pan on the floor of the pan or in a depression therein (not shown) so as not to interfere with the forward motion of the plane wheels when the plane is rolled off the turntable. To raise these wheel stops automatically as the pans are lowered, a shaft 41 is mounted in bearings on the front of the timber or box section frame 27. Secured to this shaft are pairs of cams 42, located in such position as to engage pin 43 projecting outwardly from each of the arms 40 of a pair when the pans 50 or 35, depending on which set is in the forward position, drop down. This automatically raises the wheel stops and checks the forward motion of the plane before it rolls off the turntable. Cams 42 are held in raised position by a clamp 44 which engages an operating lever 45 secured to one end of the shaft. The wheel stops can be lowered by the plane operator from the cockpit, after the motor has been started and all is in readiness for taxiing off the carriage. He does this by pulling on a connection cord or cable 46, one end of which is attached to the operating lever 45 and the other end of which the operator carries into the cockpit. This action throws cams 42 into a lowered position and permits the wheel stops to drop. The operator then tosses the cord to the ground.

The plane may also be secured to the turntable by the simple expedient of passing a strap 49, Figure 10, attached to some rigid part of the carriage through the cabin doorway and buckling it together inside the cabin. Thus when all is in readiness for the take-off, the strap can be unbuckled without leaving the plane and the ends dropped out on either side.

The present carriage may be utilized as a parking and/or starting platform, a test stand, or may be utilized as a turntable only. When used as a parking platform, the lever 45 may be padlocked in clamped position to prevent removal of the plane from the carriage. Tie down straps (not shown) fastened to the carriage frame may also be attached to the plane if it is parked in the open.

I claim:

1. In apparatus of the class described, a mobile carriage mounted on rails having a plane receiving turntable at one end and a tail wheel runway extending across the turntable and rearwardly therefrom provided with a side entrance and an exit.

2. In apparatus of the class described, a mobile carriage mounted on rails to be moved into and out of a hangar incident to garaging a plane therein, said carriage including a plane receiving turntable and a tail wheel runway extending across the turntable and rearwardly therefrom, the rear section having a side entrance.

3. In apparatus of the class described, a mobile carriage mounted on wide and narrow gauge rails having a turntable end carried on the wide gauge rails and a tail runway end carried by the narrow gauge rails.

4. In apparatus of the class described, a mobile carriage having a turntable thereon, tiltable runways mounted on said turntable for guiding the wheels of a plane thereonto and for locking them in a given position, a stationary runway mounted on said turntable and a contiguous runway extending rearwardly from said stationary runway having a side entrance.

5. In apparatus of the class described, a mobile carriage having a turntable thereon, tiltable runways, enterable from either end, mounted on said turntable for guiding the wheels of a plane thereonto and movable under the weight of the plane to a tilted position to secure the plane against movement, a stationary runway mounted across the center of the turntable and a contiguous runway extending rearwardly from the stationary runway having a side entrance through which a plane wheel may enter.

6. In apparatus of the class described, a mobile carriage mounted on rails having a turntable provided with spaced pairs of tiltable runways, enterable from either end, means for limiting the tilting movement of the runways, a center wheel runway extending across the turntable and rearwardly therefrom, a side entrance to said center wheel runway, and approach ramps for all of said runways.

7. In apparatus of the class described, a mobile carriage, rails for carrying the carriage into and out of a hangar, an inclined ramp in front of the rails, tiltable runways mounted on said turntable arranged to rest on said ramp when the turntable is in one position of adjustment, releasable means for locking the turntable against angular movement, releasable means for preventing a plane from rolling off the turntable and a tail wheel runway extending rearwardly from the turntable having a side entrance.

8. In apparatus of the class described, a mobile carriage, a track on which the carriage runs, a turntable on said carriage, tiltable runways on said turntable arranged to be raised by the weight of a plane to form a wheel block for preventing movement of the plane wheels in either direction and a releasable wheel stop associated with said runways automatically movable to operable position and means for releasing the wheel stop from the level of a plane cockpit resting on the carriage.

9. In apparatus of the class described, a turntable having a pair of movable runways thereon arranged to be raised by the weight of a plane into wheel blocking position, a tail wheel runway extending from the turntable having a side entrance through which a tail wheel may roll onto the runway and center runway across the turntable contiguous with the last named runway.

10. In apparatus of the class described, a mobile carriage mounted on rails to be moved between a plane loading position and a hangar, a turntable mounted on the carriage, elevatable ramps carried by the turntable to be raised by the weight of a plane to wheel blocking position, a stationary runway across the center of the turntable accessible from either end, a grooved tail wheel runway extending rearwardly from said turntable, a side entrance to said last named runway and an approach ramp leading thereto.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,574,271	Wilcox	Feb. 23, 1926
1,683,492	Ruth	Sept. 4, 1928
1,749,324	Craig	Mar. 4, 1930
1,816,053	McGavin	July 28, 1931
1,993,648	Cook	Mar. 5, 1935