July 10, 1945. O. GERRARD 2,380,105

AIRPLANE LANDING AND RETARDING APPARATUS

Filed March 11, 1944 4 Sheets-Sheet 1

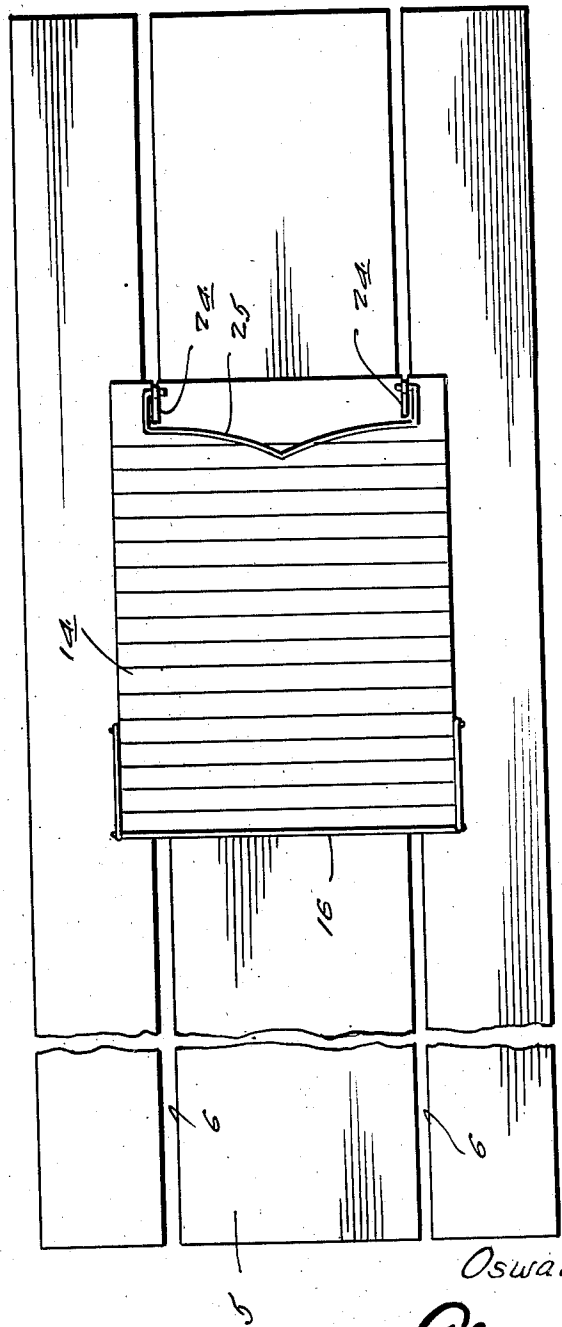


Fig. 1.

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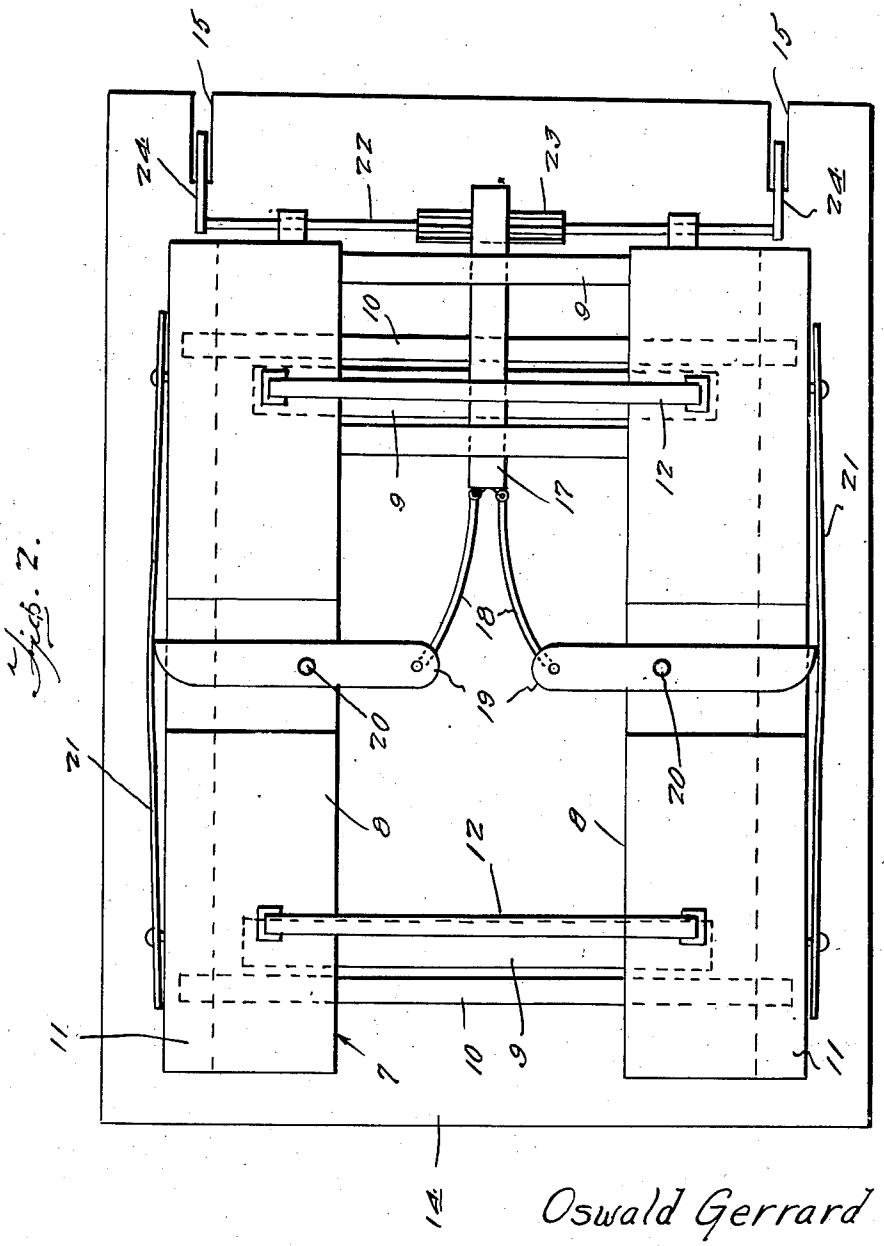


Fig. 2.

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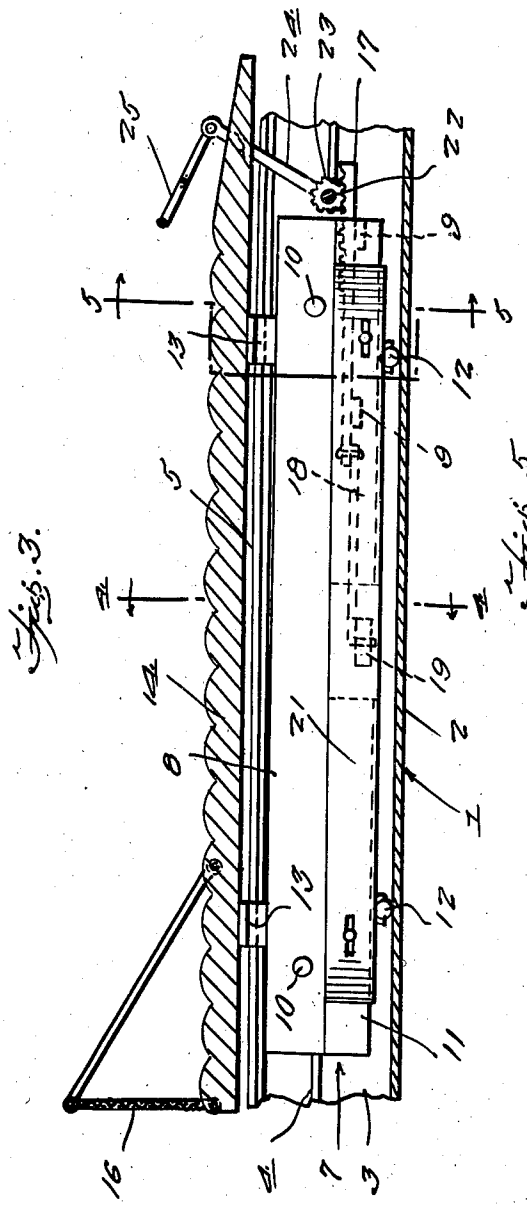


Fig. 3.

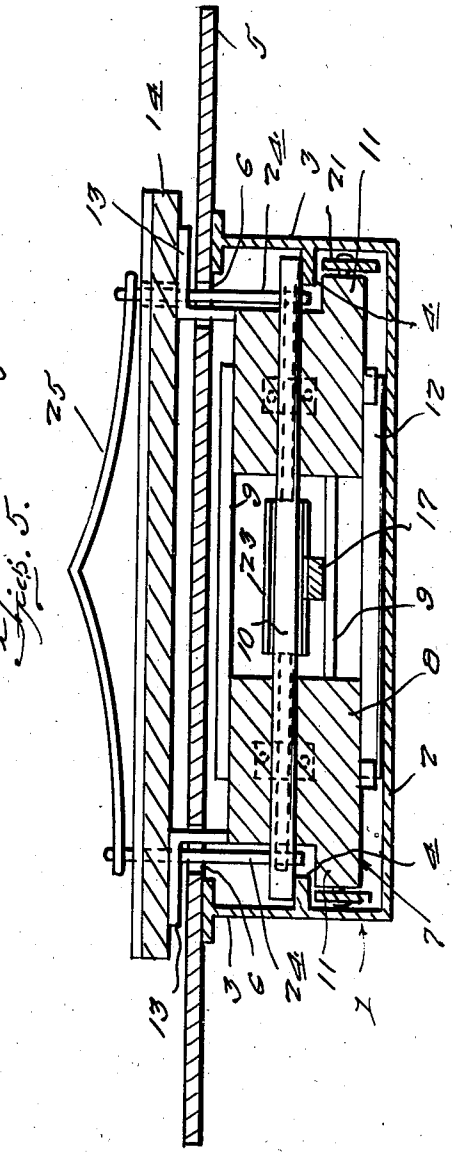


Fig. 5.

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AIRPLANE LANDING AND RETARDING APPARATUS

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Fig. 4.

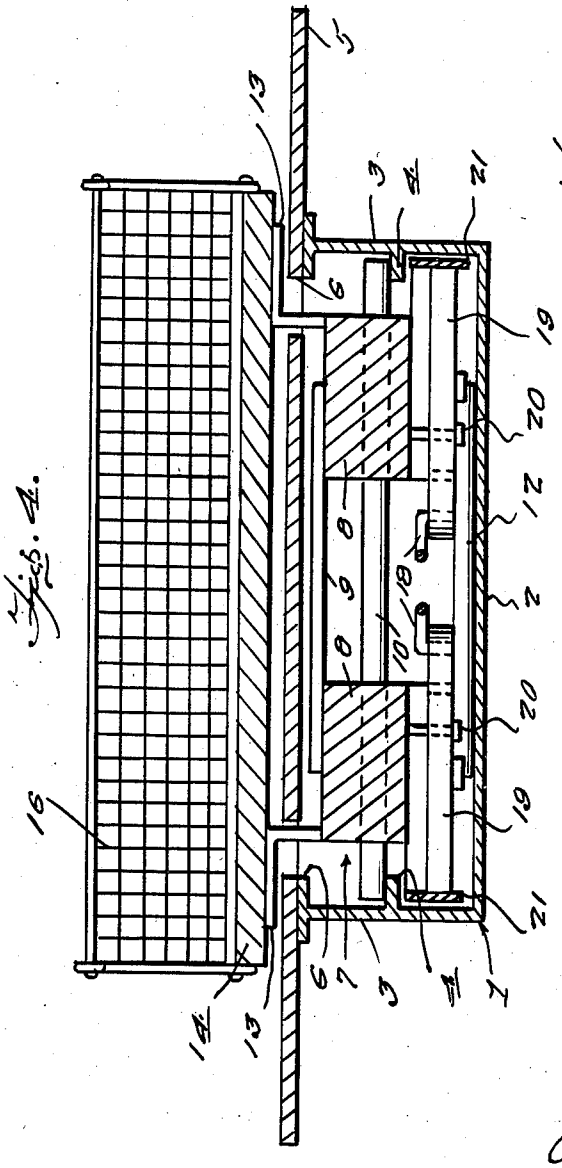


Fig. 7.

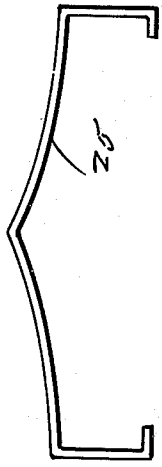
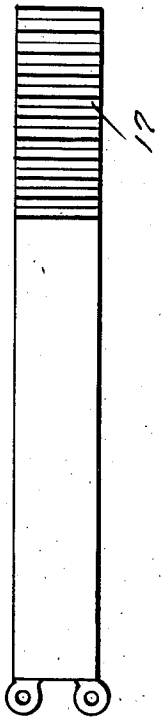


Fig. 6.



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Patented July 10, 1945

2,380,105

UNITED STATES PATENT OFFICE

2,380,105

AIRPLANE LANDING AND RETARDING APPARATUS

Oswald Gerrard, Houston, Tex.

Application March 11, 1944, Serial No. 526,026

1 Claim. (Cl. 244—110)

The present invention relates to new and useful improvements in means for landing and arresting or retarding airplanes, and has for one of its important objects to provide, in a manner as hereinafter set forth, an apparatus of this character which is adapted to be installed on land, roof tops and sea dromes, various types of vessels, et cetera.

Another very important object of the invention is to provide an apparatus of the aforementioned character comprising a novel construction, combination and arrangement for eliminating the usual long run of an airplane after contact is made, thus permitting safe landings to be accomplished in comparatively short or restricted areas.

Still another important object of the invention is to provide a landing and retarding apparatus of the character set forth comprising a carriage for receiving an airplane and traveling therewith, said carriage being actuated by the momentum of the airplane landing thereon.

A further important object of the invention is to provide an apparatus of the aforementioned character which embodies unique braking means for the carriage, said braking means being operable by the airplane, or station controlled, electric, hydraulic, air, radar, or mechanical brakes.

Other objects of the invention are to provide an airplane landing and retarding apparatus which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, and which may be manufactured and installed at low cost.

All of the foregoing, and still further objects and advantages of the invention, will become apparent from a study of the following specification, taken in connection with the accompanying drawings, wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a top plan view of an airplane landing and retarding apparatus constructed in accordance with the present invention.

Figure 2 is a bottom plan view of the carriage.

Figure 3 is a view in vertical longitudinal section through an intermediate portion of the apparatus.

Figures 4 and 5 are cross sectional views, taken substantially on the lines 4—4 and 5—5, respectively, of Figure 3.

Figure 6 is a detail view in top plan of the longitudinally slidable brake-operating bar.

Figure 7 is a detail view in elevation of the airplane retarding and brake-applying bale.

Referring now to the drawings in detail, it will be seen that the embodiment of the apparatus which has been illustrated comprises what may be considered an elongated pit which is designated generally by reference character 1. The pit 1 includes a bottom 2 from which longitudinal side walls 3 of substantially T-shaped cross section rise. Projecting inwardly from the side walls 3 are flanges constituting rails 4 the purpose of which will be presently set forth.

The pit 1 is installed beneath an elongated deck 5 of suitable length, width and material. The deck 5 has formed therein longitudinal slots 6. The slots 6 communicate with the pit 1 and are immediately adjacent the side walls 3 thereof, which side walls said slots parallel.

A carriage 7 is operable in the pit 1. The carriage 7, in the embodiment shown, includes spaced, parallel side beams 8 with cross members 9 extending therebetween. Journaled transversely in the side beams 9 are rollers 10 the end portions of which travel on the rails 4. As illustrated to advantage in Figure 5 of the drawings, the beams 8 comprise lateral flanges or tongues 11 which project beneath the rails 4. Thus, the carriage 7 is positively prevented from being lifted in the pit 1. Comparatively short rollers 12 beneath the beams 8 are adapted to travel on the bottom 2 of the pit 1.

Rising from the carriage 7 are brackets 13 which travel in the slots 6. A transversely ribbed or corrugated platform 14 is mounted on the brackets 13 for operation above the deck 5. The platform 14 has formed in its rear end portion longitudinal slots 15 (see Fig. 2). Extending across the forward end portion of the platform 14 is a crash net or guard 16.

Mounted for longitudinal sliding movement in the rear portion of the carriage 7, between the beams 8, is a rack bar 17. Arcuate links 18 connect the rack bar 17 to the inner end portions of a pair of cam levers 19 which are pivotally mounted at 20 for operation beneath the beams 8. The cams on the outer ends of levers 19 are engaged with resilient shoes 21 mounted longitudinally on the beams 8 and which are frictionally engageable with the opposed walls 3 of the pit 1 beneath the rails 4.

A transverse shaft 22 is journaled on the rear end of the carriage 7. Fixed on the shaft 22 is an elongated gear 23 which is engaged with the rack bar 17. Arms 24 on the end portions of the shaft 22 are operable in the slots 15 in the platform 14. Mounted for swinging movement on the arms 24, above the platform 14, is a bale 25

for engagement by the usual hook beneath an airplane which is equipped to make a landing in a short or restricted space.

It is thought that the operation of the apparatus will be readily apparent from a consideration of the foregoing. Briefly, when a landing is to be made, the platform 14 is positioned at the rear end portion of the deck 5 with the brakes 21 off and with the bale 25 in the position shown in Figure 3 of the drawings. The airplane making the landing alights on the platform 14, the braking hook thereunder engaging the bale 25 as said airplane passes thereover. Thus, the carriage 7 with the platform 14, on which the airplane is now resting, is connected to said airplane and is caused to move forwardly therewith by the momentum thereof. When the airplane is connected to the bale 25, said bale 25 is pulled forwardly in a manner to rotate the shaft 22 with the gear 23 thereon. The gear 23 actuates the rack bar 17 rearwardly for swinging the levers 19 through the medium of the links 18. When the levers 19 are thus actuated, the outer ends thereof flex the resilient shoes 21 outwardly against the side walls 3 of the pit 1 for bringing the carriage to a stop. The crash net or guard 16 may be swung downwardly to permit the plane to pass thereover when leaving the platform 14.

It is believed that the many advantages of an airplane landing and retarding apparatus constructed in accordance with the present invention will be readily understood, and although a preferred embodiment of the device is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:

An airplane landing and retarding apparatus of the character described comprising an elongated pit, longitudinal rails in said pit, an elongated deck mounted longitudinally above the pit, a carriage operable on the rails in the pit, a platform, for receiving an airplane making a landing, mounted on said carriage and operable above the deck, brakes on the carriage frictionally engageable with certain of the walls of the pit, a bale mounted for swinging movement on the carriage, said bale for connection with an airplane for anchoring said airplane on the platform, a lever secured to said bale, a pinion on said lever, a rack movable by said pinion, and additional levers movable by said rack to apply said brakes, for braking the carriage with the airplane on the platform.

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