May 1, 1928. 1,668,113

H. H. HAASE ET AL

AIRPLANE ARRESTING HOOK

Filed Sept. 12, 1927 2 Sheets-Sheet 1

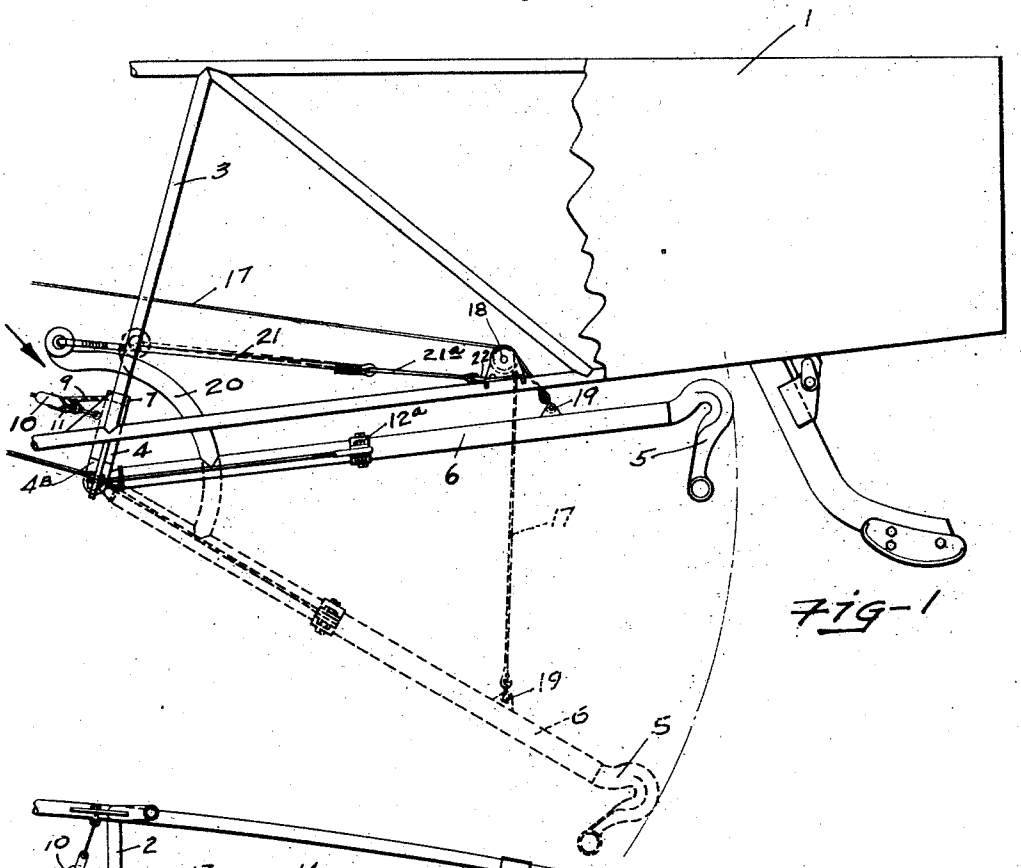


FIG-1

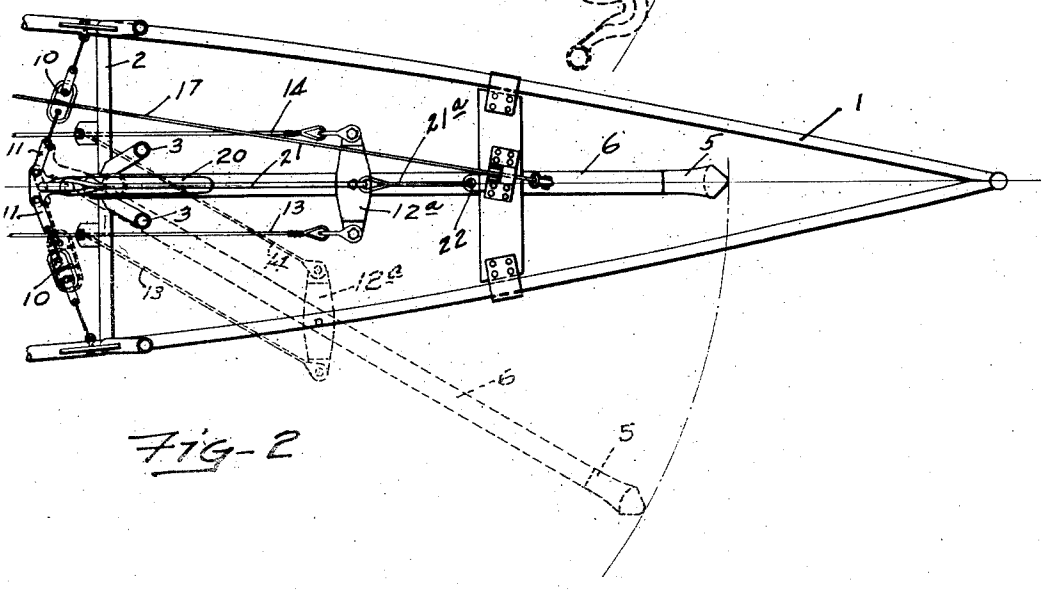


FIG-2

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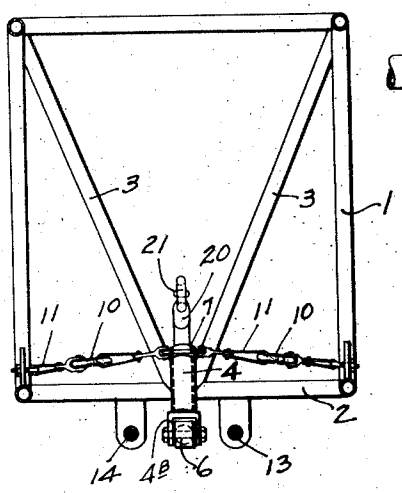
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FIG-3



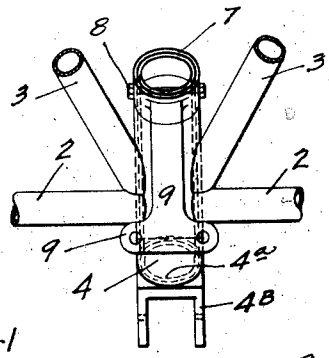


FIG-4

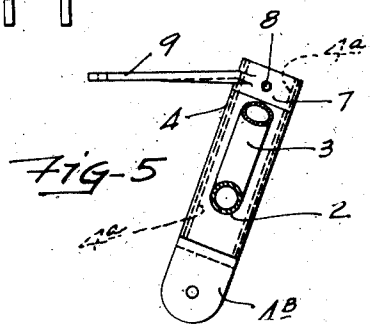


FIG-5

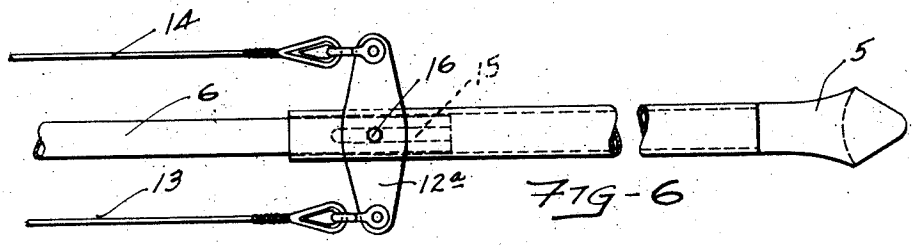


FIG-6

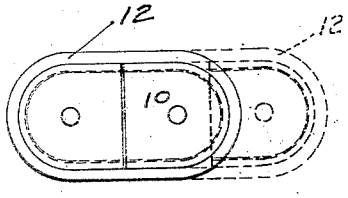


FIG-7

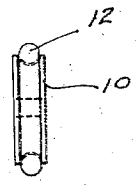


FIG-8

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Patented May 1, 1928. 1,668,113

UNITED STATES PATENT OFFICE.

HERMAN H. HAASE AND FREDERICK G. ARNOLD, OF SEATTLE, WASHINGTON, ASSIGNORS TO BOEING AIRPLANE COMPANY, OF SEATTLE, WASHINGTON.

AIRPLANE-ARRESTING HOOK.

Application filed September 12, 1927, Serial No. 219,129.

This invention relates to improvements in apparatus employed by airplanes for engaging with arresting gear and the like that may be provided on short landing fields and other places of limited size not having sufficient length for the normal type of landing.

A principal object of the invention, is to provide apparatus of this character which will automatically centralize itself with respect to the longitudinal axis of the airplane; insure positive, rapid and accurate locating of the hook into its operative position, and at the same time permit yielding movement of the hook under spring tension for encountering any irregular surfaces or parts of the landing gear which may be in the path of movement of the plane making a landing.

A further object is the provision of sufficient strength in the hook centralizing means, for straightening the course of travel of the plane after the hook has engaged a portion of the arresting gear, as it is quite common in making such landings for a plane to approach the arresting gear at an angle due to side winds, skidding, and the like.

These and other objects will appear as our invention is more fully hereinafter described in the following specification illustrated in the accompanying drawings and finally pointed out in the appended claim.

In the drawings:—

Fig. 1 is a fragmentary side elevation of an airplane, showing our improved apparatus in operative engagement therewith.

Fig. 2 is a plan view of Fig. 1.

Fig. 3 is a front end elevation of Fig. 1.

Fig. 4 is a fragmentary perspective plan view, looking in the direction of the arrow in Fig. 1, with some parts omitted for convenience in illustration.

Fig. 5 is a side elevation of Fig. 4.

Fig. 6 is an enlarged fragmentary plan view of our improved form of hook and shock absorbing means therefor.

Fig. 7 is a detail view of an expansion member.

Fig. 8 is an end elevation of Fig. 7.

Referring now more particularly to the drawings:—

Reference numeral 1 indicates the fuselage of an airplane, made up of the usual truss work construction with the customary longitudinal transverse, vertical and diagonal tubular bracing. Centrally disposed in one of the transverse members 2, and rigidly mounted to it and between a pair of diagonal bracing members 3, is a tubular bearing 4 which pivotally supports another tubular member 4^a, the lower end of which is bifurcated as at 4^b to form a pivotal connection with a hook member 5 and its shaft 6. The uppermost end of the bifurcated member 4^a is provided with an apertured collar 7 to receive a bolt 8, for retaining the tubular member 4^a within the tube 4, and permitting rotary motion between the two tubes. 9 indicates an arm integral with the collar 7, which extends outwardly therefrom in alignment with the hook shaft 6, so that as the hook shaft is moved from side to side a corresponding movement will be imparted to the arm 9, each side of the arm is yieldingly secured to the side members of the fuselage by means of resilient members 10, and suitable links 11. The resilient members 10 (see Figs. 7 and 8) are formed with a pair of grooved blocks of substantially semi-circular formation abutting each other as shown, and embraced by an endless piece of shock absorber cord 12, or any other suitable resilient means, so that when the hook shaft 6 is moved from side to side in either direction as shown in dotted lines in Fig. 2, tension will be applied to the arm 9, thus restoring the shaft to its normal and central position. Centrally located on the shaft 6 and pivotally mounted thereto is a cross-arm 12^a to the outer ends of which are secured cables 13 and 14 which extend to the forward end of the fuselage and are securely anchored for distributing the stress of the hook when engaging with the arresting gear. The arm 12 being pivotally mounted to the shaft 6 permits the cables to maintain a parallel relationship at all times. The shaft 6 is made up of two parts, as shown in Fig. 6, the smaller portion being slotted as at 15, to slidably embrace a pivot pin 16, so that when the hook engages the arresting gear, the shock will be absorbed by the cables and not the pivoted end of the hook shaft and its pivotal connections. 17 indicates another cable coming from a point within convenient reach of the pilot, extending over a pulley 18, and connecting with the hook shaft as at 19, for raising and lowering the hook. 20 indicates a curved projection from the shaft 6 to which is secured one end of a resilient member 21, the opposite end being secured

by a link 21ª, to the fuselage as at 22 to insure positive and rapid lowering of the hook when the cable 17 is slackened by the operator.

While we have shown a particular form of embodiment of our invention, we are aware that many minor changes therein will readily suggest themselves to others skilled in the art without departing from the spirit and scope of our invention.

Having thus described the invention, what we claim as new and desire to protect by Letters Patent is:—

In apparatus of the class described, the combination of a hook the shank of which is pivotally mounted at a point below the bottom of the body of an airplane said shank being formed with a vertical and horizontal continuation in advance of said pivotal connection, said horizontal continuation engaging with a pair of oppositely disposed resilient members for aligning said shank with the longitudinal axis of the airplane body when the hook is operatively engaged, a curved arm extending upwardly and forwardly from said shank and engaging with a resilient cable, the opposite end of said cable being secured to the airplane body and adapted to lower said shank against the rush of air incident to flight of the airplane.

In testimony whereof we affix our signatures.

HERMAN H. HAASE.
FREDERICK G. ARNOLD.