May 6, 1941. R. G. STOEHR 2,240,724

AIRPLANE JACK AND SUPPORTING SYSTEM

Original Filed May 29, 1940 2 Sheets-Sheet 1

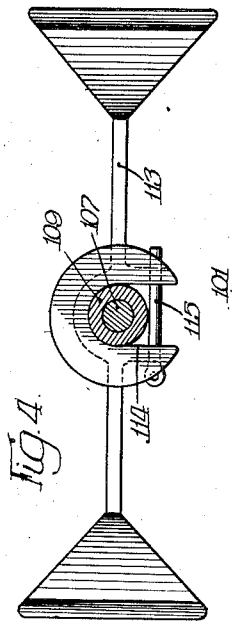


Fig. 4

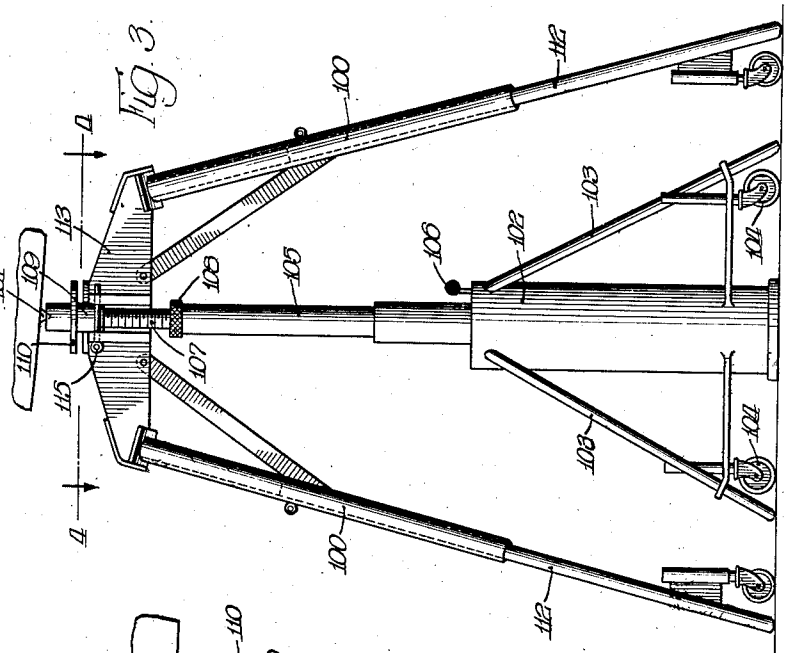


Fig. 3

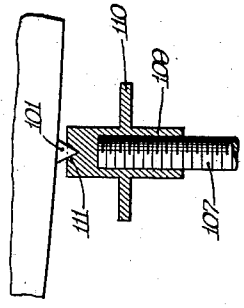


Fig. 2

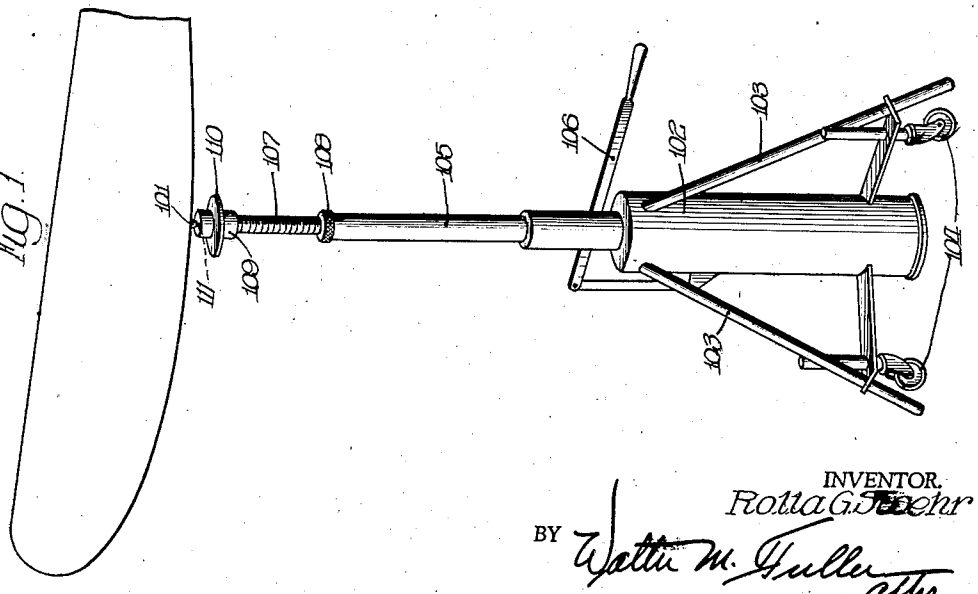


Fig. 1

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Fig. 6.

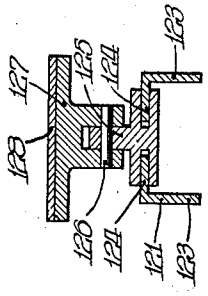
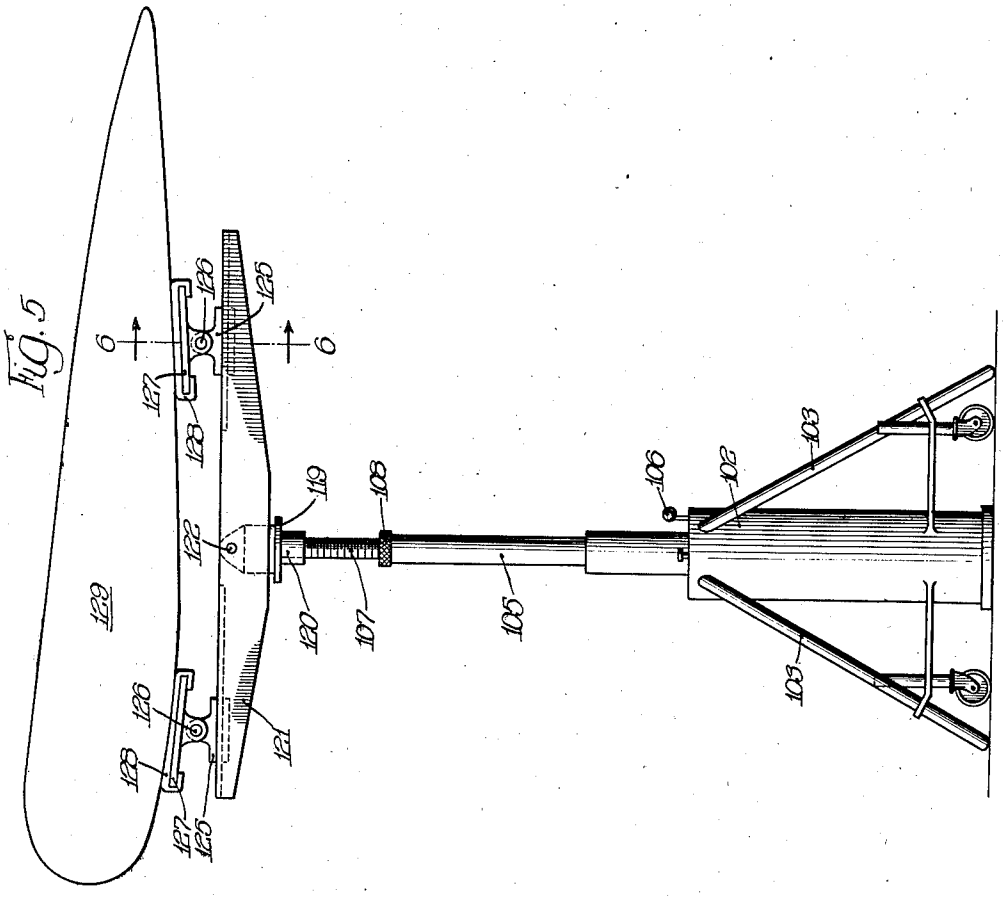


Fig. 5



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AIRPLANE JACK AND SUPPORTING SYSTEM

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Original application May 29, 1940, Serial No. 337,763. Divided and this application December 21, 1940, Serial No. 371,125

8 Claims. (Cl. 254—1)

This invention relates to means for raising and lowering airplanes and comparable structures and to companion and cooperating means for maintaining the airplane, or the like, in such elevated servicing and repairing relation, thus allowing the jack-means employed for such lifting to be removed and used elsewhere, it being understood that the reverse of such procedure is resorted to for the lowering of the airplane.

Such invention comprises a system of devices coacting and conjointly functioning with one another to produce the desired results in a simple, satisfactory and efficient manner by means particularly adapted to perform the stated functions.

To enable those skilled in this art to fully understand the instant invention, present preferred embodiments thereof have been illustrated in the accompanying drawings, forming a part of this specification, and to which reference should be had in connection with the following detailed description, and, for simplicity, like reference numerals have been employed to designate the same structural parts throughout the several views of the drawings.

In these drawings:

Figure 1 illustrates a portion only of a wing of the airplane in raised position by means of one of the novel wing-jacks;

Figure 2 shows fragmentarily and in vertical section the transfer-member adapted to cooperate either with the jack or with the supporting-trestle;

Figure 3 shows the members presented in Figure 1 in association with a wing-trestle for transfer of the weight of the wing from the jack to the trestle or the reverse;

Figure 4 is a horizontal sectional view of the interfitted wing-jack and wing-trestle shown in Figure 3 on line 4—4 of Figure 3;

Figure 5 illustrates another means for lifting and lowering a wing of an airplane; and

Figure 6 is a vertical cross-section on line 6—6 of Figure 5.

Assuming that suitable jack-means have been provided for raising and lowering the tail and fuselage portions of an airplane, it will be clear that its wings should be elevated and lowered either simultaneously with such operation or prior, or subsequent, thereto, it being apparent that ordinarily both wings of the plane should be raised or let down more or less simultaneously and equally, one only of the pair of jacks and trestles employed for this purpose being illustrated and described below.

Some airplane-wings are capable of being raised and lowered solely through small, short, downwardly-directed, conically-pointed pins or studs 101 permanently mounted in or on the undersides of the wings, as presented for instance in Figure 1, and, accordingly, each such wing must be elevated and lowered solely by engagement with its specified stud.

The jack used for this purpose is illustrated in Figures 1, 2, 3 and 4, and it comprises an upright, hydraulic-cylinder 102 mounted on downwardly-diverging legs 103, 103, each fitted with an automatic, retractable, spring-actuated, caster-wheel 104 of known construction, the upright plunger 105 of such cylinder being operated by a manually-worked pump-handle 106 in familiar manner, there being nothing novel in this portion of the jack, since its construction and mode of action are well understood in the art.

The upper end of this hollow plunger accommodates a screw-threaded, extension shaft 107 fitted with a knurled-nut 108 bearing on the flat upper end of the plunger, whereby the degree of upward extension of the shaft beyond the top end of the plunger is readily and fairly-quickly adjustable to meet different working conditions.

The top end of the shaft is designed to fit in a socket in the under side of a transfer-member 109 having an intermediate, circular, outstanding flange 110 and also having in its upper end a conical-socket 111 shaped, designed and adapted to receive the stud 101 of the airplane-wing.

Such jack having been placed beneath the wing of the airplane with its screw-threaded shaft 107 and the member 109 in alignment with the stud 101 of the airplane-wing, nut 108 is turned to elevate the shaft causing the end of member 109 to receive and accommodate the wing-stud.

If need be, or if desirable, the plunger may be forced up by actuation of the handle 106 to assist in bringing the jack and stud into the specified coactive relation.

Then the jack-handle is operated to force the plunger upwardly to raise the wing to the needed height.

The wing-trestle 100 for supporting the wing after the latter has been thus elevated (Figures 3 and 4), includes four, downwardly-divergent, suitably-braced, automatic-caster-wheel-equipped legs 112, 112 sustaining an upper, suitably-shaped, flat-top supporting-member 113 having an open-side, open-top, open-bottom cavity 114, the latter being of adequate caliber to receive the upper end of the jack-screw 107

and the lower end portion of member 109, the cavity also having a demountable or detachable retaining-pin 115 occupying registered, horizontal holes through the side-walls of the cavity, and, when so positioned, extending across the otherwise open mouth of the recess.

Assuming that the wing has been lifted to the required height by the jack, and that pin 115 has been temporarily removed, trestle 100 is positioned so that its cavity or recess 114 receives the lower part of member 109 and the upper part of the screw 107 on which such member is mounted, whereupon the pin 115 is put back in place to prevent accidental displacement of the associated appliances.

Subsequently, the jack is lowered to transfer member 109 to, and for support on, the wing-trestle and to effect withdrawal of the screw-shaft from the socket of such member, upon the completion of which action the jack may be rolled away for other use.

Obviously, when the plane-wing is to be lowered, the reverse of the above-stated operation is pursued.

In some cases, the airplane-wings are not equipped with such supporting-studs 101 and then a different means is used as indicated in Figures 5 and 6.

Under such circumstances, the screw-shaft of the wing-jack fits at its top end in a socket in the under side of a member 120 having a round, outstanding flange 119 corresponding to the flange 110 of member 109.

A frame 121 is hinged to member 120 at a point 122 about midway the length of the frame, the latter, by means of end-slots therethrough providing a pair of spaced-apart side-walls 123, 123 with top, marginal, inwardly-directed flanges 124, 124 along the end portions only of the frame, the middle section of such frame not being thus slotted.

Each end of the frame is supplied with a grooved block 125, the opposite grooves of which receive the flanges 124, 124, so that the blocks are adjustable along the frame, and each such slidable member 125 has hinged thereto at its middle at 126 a member or shoe 127 faced with suitable material 128 of a character or type which will not injure the wing 129 of the airplane with which it is adapted to directly contact.

The manner in which the jack and its modified saddle are operated and the procedure by which the support of the wing is transferred to and from the wing-trestle 100 will be readily understood from what precedes, it being clear that, by reason of the hinged mounting of the parts, such saddle will automatically accommodate itself to airplane-wings of different sizes and varying shapes.

Those acquainted with this art will understand that the invention is not necessarily limited to the exact and precise details shown and described and that various modifications may be resorted to without departure from the heart and essence of the invention as defined by the appended claims and without the loss or sacrifice of any of its substantial benefits and advantages.

This application is a division from my copending patent application Serial No. 337,763, Airplane lifting and supporting system, filed May 29, 1940.

I claim:

1. In an airplane-wing lifting, lowering and supporting system, the combination of transfer-means designed to engage the underside of the airplane-wing, a lifting and lowering jack adapted to carry said transfer-means and to raise and to lower the wing thereby, and a supporting-trestle adapted to be placed in cooperative relation with said transfer-means in its elevated wing-supporting position and to receive and to support said transfer-means upon lowering thereof by said jack, the construction being such that said jack may be removed for other use upon its delivery of said transfer-means to said trestle, the reverse of said operations causing the lowering of said wing.

2. The system set forth in claim 1 in which said transfer-means has a socket in its upper end adapted to receive a downwardly-directed stud on the under side of the airplane-wing.

3. The system set forth in claim 1 in which said transfer-means includes a saddle hinged intermediate its ends and adapted to support the airplane-wing from its under side.

4. The system set forth in claim 1 in which said transfer-means has a saddle hinged intermediate its ends and adapted to support the airplane-wing from its under side, said saddle near each end thereof having a shoe hinged intermediate its ends to the saddle, said shoes engaging the under-side of the airplane-wing.

5. The system set forth in claim 1 in which said transfer-means has a socket in its lower portion adapted to detachably receive a part of the jack.

6. The system set forth in claim 1 in which said trestle has a side-open recess therein to receive at least a part of said transfer-means.

7. The system set forth in claim 1 in which said trestle has a side-open recess therein to receive at least a part of said transfer-means, in combination with means to open and close said side-opening of said recess.

8. The system set forth in claim 1 in which said transfer-means has an outstanding flange adapted to bear on said trestle to support the airplane-wing thereon.

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