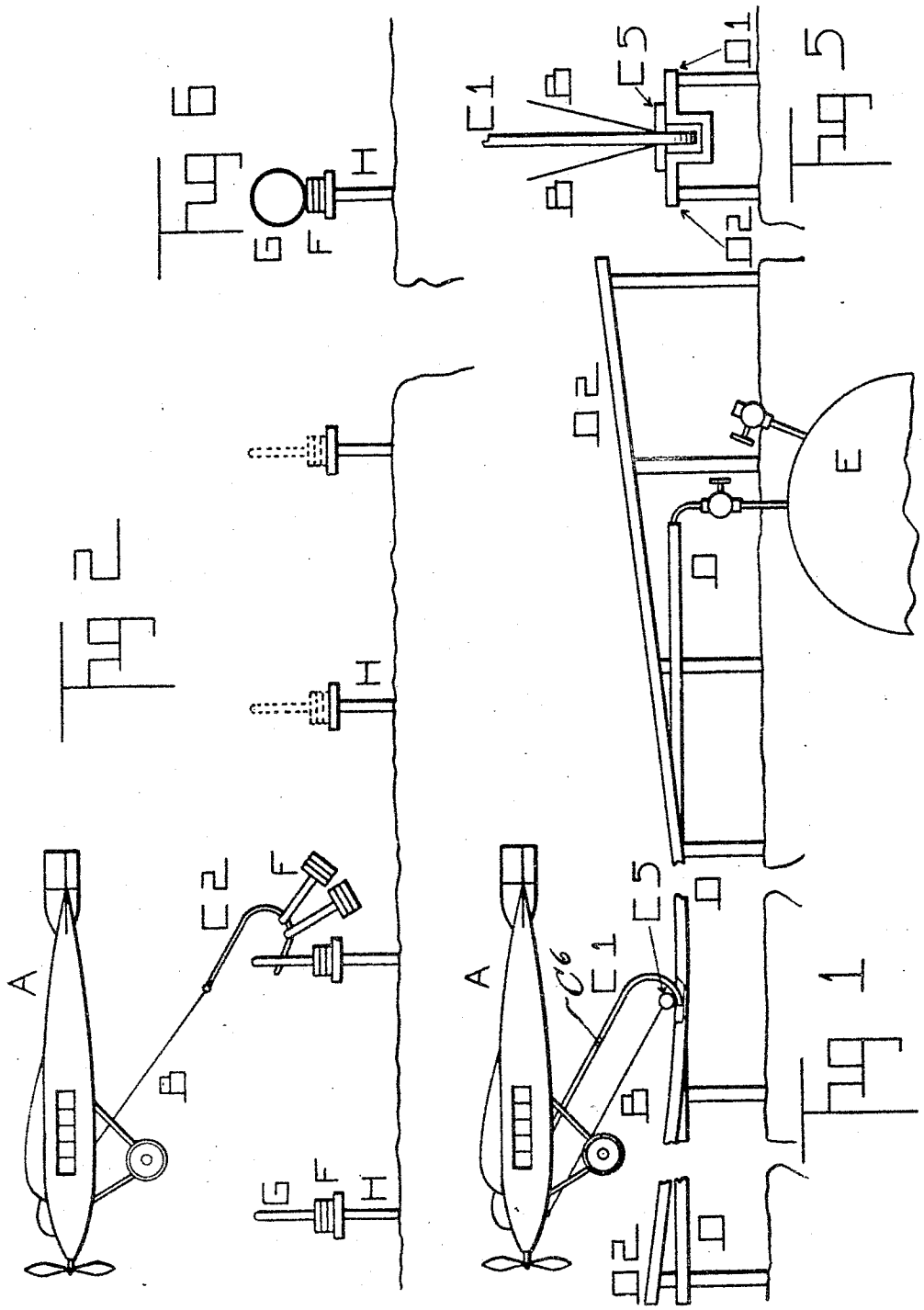
July 15, 1930. C. F. JENKINS 1,770,700

METHOD OF LOADING AIRPLANES

Filed Feb. 23, 1929 2 Sheets-Sheet 1



Witness:

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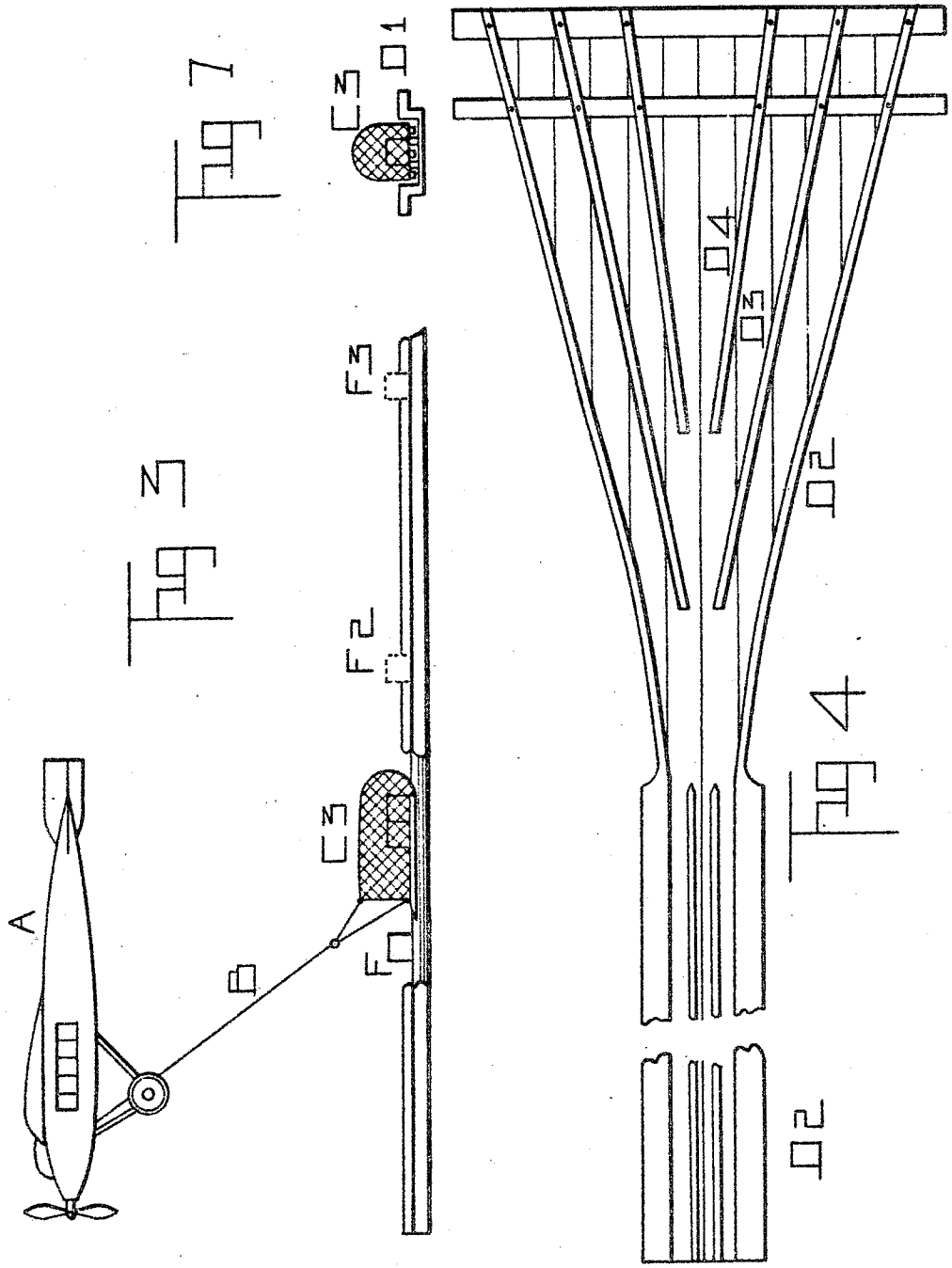
By

Attorney

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METHOD OF LOADING AIRPLANES

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UNITED STATES PATENT OFFICE

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METHOD OF LOADING AIRPLANES

Application filed February 23, 1929. Serial No. 342,105.

This invention relates to devices for refueling airplanes in flight, and has for its principal object means for picking up the fuel in small increments to prevent shock to the plane, which would result from attempts to pick up the whole load at once. Other uses will also be referred to herein.

Until now, the method used for refueling, from the ground, an airplane in flight, consists in taking the full unit quantity at one time. This is done by using a stout pendant chain with hook thereon to engage a container, for example, 25 gallons of fuel, the chain being attached to the plane, and the fuel given a catapultic start to ease the destructive shock on the plane of starting such a mass from rest. To engage the fuel and container without an initial start would tear the chain loose from the plane, if it did not wreck the plane itself.

The method herein described picks up the same load in small increments; so that there is no shock to the plane. And further, as the load picked up and moving with the plane increases, the unit increment bears a less and less fractional relation to the whole load, with the result that almost any mass can be so picked up, and without disturbing the control of the plane in the least.

With this and other objects in view the invention consists of the novel method and combination of elements herein described, illustrated in the drawings, and particularly pointed out in the claims.

In the drawings, Figure 1 shows a plane refueling; Figure 2 a plane picking up small packages with a hook; for example, packages of mail; Figure 3 a plane picking up small packages in a netbag; Figure 4 a top view of the horizontal grating from which the bag gathers the packages; Fig. 5 is an end view of the platform shown in Fig. 1. Fig. 6 is a face view of one of the supports illustrated in Fig. 2. Fig. 7 is an end view of the material supporting structure illustrated in Fig. 3.

Referring to the drawings, an airplane A has attached thereto wires B for dragging the collectors, such as pipe C^1, hook C^2, or bag C^3, illustrated in Figs. 1, 2 and 3, respectively. The forward projecting end of the pipe C^1 dips into a fuel trough D to scoop up fuel. C^5 is a cross-bar for holding up the scoop-end of the pipe to prevent scraping along on the bottom of the fuel trough. D^1 and D^2 are horizontally-extending flanges or wings of the trough; E is an underground tank from which fuel is pumped or otherwise delivered into the trough. The wings at both ends of the trough are raised so that the intake end of the pipe C^1 may not destructively engage therewith in entering and in leaving the trough. Obviously, the trough may be of any required length.

In Figure 2 a hook is substituted for the fuel pipe, and picks up small packages F, F, F, fastened to hoops G, temporarily supported on pedestals H, H, H. The increasing load does not cause a shock on the plane, but rather lessens it.

The hoop shape also aids, by reason of its elasticity, in giving each package, or fractional part of the whole load, a minimum shock at the start.

In Figure 3 the pick-up is a silk-net bag C^3; F is a package about to be picked up by the bag, which latter has already picked up similar packages from positions F^2 and F^3.

Figure 4 is a top view of the grating upon which packages are laid to be picked up; and shows a fan-like entrance section made up of flexible members with free exit ends for guiding the collector-bag into alignment with the package-holding section thereof.

The method of picking up the load in small fractional increments of the whole load is believed so nearly obvious from the drawings that a detailed description is almost superfluous.

However, the operation is about as follows:—The pilot approaching the loading platform brings his plane into alignment therewith by sighting on distant natural or artificial objects, or sights as he glides to a pick-up level.

The collector (Figure 3) having been lowered picks up the packages as it is dragged along on the platform grating, being guided into exact longitudinal position therewith by the flexible strips D^3 and D^4, and their corresponding mates. Before the end of the grat-

ing is reached the plane will have nosed up, carrying its load with it, which load then is taken into the plane.

The collector bag is woven of silk cord and is both light and strong, and the strain on the net is but little increased by the impact of each succeeding package, because, with the collection of each, the mass is augmented and each package, therefore, bears a smaller and smaller relation to the load already in motion.

In similar fashion the hook, Figure 2, picks up its load in successive fractional parts of the whole load, packages of mail, for example, each being attached to a ring or hoop, for example, a child's wooden rolling hoop, to which the packages of mail have been tied.

Incidentally these hoops would be thrown overboard at the next mail collection point, attached to the parachute which drops the mail for that place, and would be used (the hoops) in picking up the mail oppositely bound.

The same general method is employed in refueling from the ground, for the fuel load is picked up in small increments, as the scoop-positioned square end of the fuel pipe depending from the plane is drawn along in the trough. The velocity of movement of the pipe-end through the stationary fluid drives the fuel up into the tanks in the plane.

To insure that the pipe end shall get into the trough, the lateral wings D^2 of the trough spread out, like that shown in Figure 4; and to prevent hooking on the end of the trough, the grating is raised so that the pipe end is held above the trough level by the cross-bar C^5 until after the end of the trough is passed. Similarly the far end of the trough wings are elevated to lift the pipe end above the level of the trough.

These three illustrations are believed to illustrate the method employed in picking up loads from the ground by an airplane, though obviously a great variety of portable loads can be so picked up.

The scoop end of the pipe C^1 may be of any suitable shape in cross section and its upper end may be connected with the plane in any suitable manner to enable the pipe to be readily lowered into and out of operative position. Any suitable material may be employed in the construction of the pipe C^1 and, if desired, the upper portion may consist of a flexible hose or tubing connected to the lower portion by a suitable coupling C^6, as shown.

By picking up or collecting a load of fuel or any other material from the ground, it will be understood that this in intended to cover and comprehend not only the taking of a load literally from the surface of the ground, but from any fixed or stationary position.

The sizes of the different elements illustrated in the drawings are not intended to bear any definite or limiting relation, nor are the angles fixed by those shown.

What I claim is:—

1. The herein-described method of loading a plane in flight, which consists in dividing a load into separate parts, arranging the divided load on stationary supporting means at intervals, successively picking up by the plane the parts of the divided load by collecting means suspended from the plane, and allowing the collected parts to accumulate on the suspended means to proportionally reduce impact of the collection on the plane as the load is picked up.

2. The herein-described method of loading a plane in flight, which consists in dividing a load into separate parts, arranging the divided load on stationary supporting means at intervals, successively picking up by the plane the parts of the divided load by collecting means suspended from the plane, allowing the collected parts to accumulate on the suspended means to proportionally reduce impact of the collection on the plane as the load is picked up, and transferring the accumulated parts of the load from the collecting means to the plane.

3. The method of supplying an airplane in flight in the air with material distributed in fixed position along the path of flight of the airplane, which consists in bringing the airplane to a pick-up level with relation to the distributed material and picking up the material from the fixed position gradually as the airplane passes over the material so as to transfer a load of material to the airplane gradually in quantities less than the completed load taken from the fixed position to thereby relieve the airplane of the impact incident to picking up the entire load at one time.

In testimony whereof I have affixed my signature.

CHARLES FRANCIS JENKINS.