

G. O. DRAPER.  
 LANDING AND STARTING APPARATUS FOR AEROPLANES.  
 APPLICATION FILED DEC. 3, 1909.

965,881.

Patented Aug. 2, 1910.

Fig. 1.

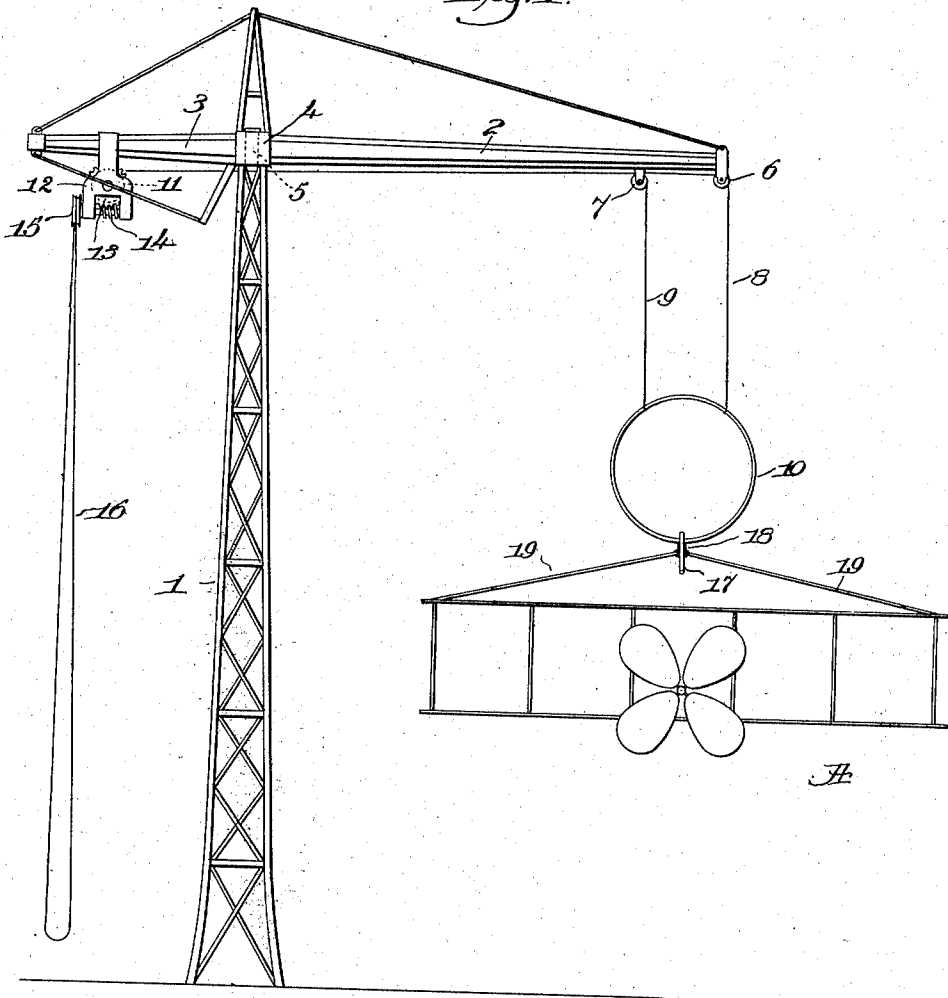
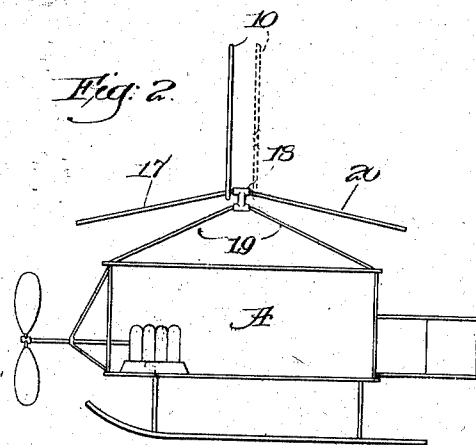


Fig. 2.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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LANDING AND STARTING APPARATUS FOR AEROPLANES.

965,881.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed December 3, 1909. Serial No. 531,136.

*To all whom it may concern:*

Be it known that I, GEORGE OTIS DRAPER, a citizen of the United States, and resident of New York, county of New York, State of New York, have invented an Improvement in Landing and Starting Apparatus for Aeroplanes, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention has for its object the production of simple and efficient apparatus primarily intended to be used as a landing device for aeroplanes, although as will appear hereinafter the apparatus can be used for starting and testing aeroplanes.

As the use of aeroplanes increases one of the greatest difficulties to be met with will be in landing and starting them, particularly in the matter of landing. Even if the landing is effected on a level plot of ground, which must be of relatively large area, the aeroplane will often sustain a severe shock, which will damage the frail framework or some of the propelling apparatus. The starting of an aeroplane is also attended with difficulty.

My present invention overcomes the various difficulties now found to exist and provides means of a relatively simple character by which an aeroplane can land or start readily, even in thickly settled communities.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a view in elevation illustrating one practical embodiment of my present invention, showing an aeroplane suspended therefrom as it has come to rest after a flight; Fig. 2 is a detail viewing Fig. 1 from the right, showing the means on the aeroplane for cooperating with the suspending device when landing or starting.

In general my invention comprehends an upright post, column or tower of suitable height, carrying at its top a laterally swinging arm from the outer end of which depends a large hoop-like receiver, adapted to be entered by an elongated hook fixedly attached to the aeroplane in a fore and aft direction, so that when the operator of an aeroplane wishes to make a landing he steers his vehicle ahead until the end of the hook

passes into the receiver. The motor is stopped at the proper time and the momentum of the aeroplane completes the engagement between hook and receiver, so that as the aeroplane comes to rest it is suspended clear of the ground and experiences no injurious shock or jar, for if the momentum be sufficient the suspending arm will swing about its axis more or less.

Referring to Fig. 1 a suitable upright tower or column 1 of any desired construction to provide the requisite strength and rigidity, is erected at the place selected for landing and starting, in a field, on the top of a high building in a city, or in any other convenient place. Upon the top of the structure 1 is rotatably mounted an elongated and properly braced or trussed carrier 2, 3, and herein I have shown said carrier as provided with a heavy bearing 4 to revolve upon an upright fulcrum 5 fixedly secured to the tower 1. So far as concerns my invention any suitable pivotal connection can be employed between the tower and the carrier so long as the latter can swing freely in a lateral direction about the tower as a center.

The long arm 2 of the swinging carrier is shown in Fig. 1 as provided at its free end with separated sheaves 6, 7 over which travel flexible members 8, 9 such as light chains, ropes or the like, the depending ends thereof being attached to a large hoop-like or annular receiver 10, made of braided cane or some suitable material which is light yet strong. By the separated suspending members 8 and 9 the receiver is maintained in a fixed plane with relation to the carrier, and herein it is parallel thereto, so that sudden gusts or currents of air would not be apt to turn or twist the receiver into various positions. The suspending members 8 and 9 are led along below the carrier to a drum 11 rotatably mounted in a frame 12 fixedly secured to the short arm 3 of the swinging carrier, a worm-gear 13 attached to the drum being driven by a worm 14 having attached to it a sheave 15 over which travels a depending, endless operating rope or chain 16, which is long enough to be operated from the surface upon which the tower 1 stands. This drum device is a hoisting mechanism of well known character, and in itself forms no part of my invention, as any other suitable means can be employed for so manipulating the suspending members 8 and 9

that the receiver 10 can be raised or lowered at will. The sheaves 6 and 7 may be located such a distance apart on the carrier arm as will best maintain the receiver 10 in a constant plane with relation to the overhead carrier.

The aeroplane is indicated as a whole at A, and its particular construction is of no moment so far as my invention is concerned, but in order that it may utilize the landing device described I attach to the aeroplane, preferably at its top, an elongated finger or projection 17, of strong material, rigidly held in a casting 18 preferably of aluminum, connected by braces 19 with the top of the aeroplane frame work. Said finger or projection 17, which has a slight forward and downward inclination, forms with the casting 18 a species of hook-like catcher, extending fore and aft at the top of the aeroplane, and adapted to enter the receiver 10. When the aeroplane is in motion the operator, desiring to land, heads it for the receiver 10, and he can easily determine when the free end of the catcher 17 enters the receiver. The motor is stopped at this instant, or just before, according to the judgment and skill of the operator, and the momentum of the aeroplane will cause the receiver 10 to run up the catcher 17 to the position shown in full lines, Fig. 2, against the casting 18, holding the aeroplane suspended as it comes to rest. Probably in the majority of cases the motion of the aeroplane will cause the carrier 2, 3 to swing on its pivot, so that there will be nothing sudden or violent in the stoppage. It is immaterial when the catcher 17 enters the receiver 10, for once its extremity enters the receiver the catcher is bound to come to rest in the position shown in Fig. 2, the suspended aeroplane coming to rest without having come in contact with any stationary structure. By means of the controlling belt 16 the drum 11 can then be rotated by an attendant to lower the aeroplane to the ground if desired, or if preferred some movable support could be placed beneath it.

To use the apparatus for starting a rearwardly extended projection 20 secured to the casting 18 is passed through the receiver 17, as shown by dotted lines, Fig. 2, and the aeroplane is then elevated by the drum mechanism to a suitable height. If now the motor is started the aeroplane will move ahead slowly, turning in a circle as the carrier 2, 3 revolves, and when sufficient

speed is attained the projection 20 will be withdrawn from the receiver and the freed aeroplane will proceed on the desired course. 60

The apparatus can be used for testing purposes, manifestly, for if the speed be kept down to proper limits the aeroplane will not be detached from the receiver, but will travel in a circle as long as may be desired. 65

The downward inclination of the projection 20 prevents liberation of the aeroplane by a mere forward movement, for considerable speed and uplifting action must be attained before the aeroplane will separate itself from the pendulous ring-like receiver. 70

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:— 75

1. In apparatus of the class described, an overhead carrier, a receiver suspended therefrom and adapted to receive a fore and aft projection on an aeroplane, and means to maintain the receiver in a definite position with relation to the carrier. 80

2. In apparatus of the class described, an overhead, horizontally revoluble carrier, a fixed fulcrum about which the carrier is free to revolve, and a ring-like receiver suspended from the carrier and adapted to receive a projecting member of an aeroplane. 85

3. In apparatus of the class described, an overhead carrier, an open receiver suspended therefrom and adapted to be entered by a catching member on a moving aeroplane, and means to raise and lower the open receiver. 90

4. In apparatus of the class described, a suspended open receiver adapted to receive a part of an aeroplane while in motion, and means to maintain the receiver in a predetermined position. 95

5. In apparatus of the class described, an upright supporting member, a carrier pivotally mounted thereon to swing laterally, a ring-like receiver suspended from the carrier and adapted to receive an aeroplane, and means to maintain said receiver in a vertical plane radial to the axis of rotation of the swinging carrier. 105

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

GEORGE OTIS DRAPER.

Witnesses:

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R. A. LESTER.