Jan. 16, 1945. S. C. PLUMMER 2,367,607

GROUND STATION FOR AIR PICK-UPS

Filed Sept. 23, 1941 2 Sheets-Sheet 1

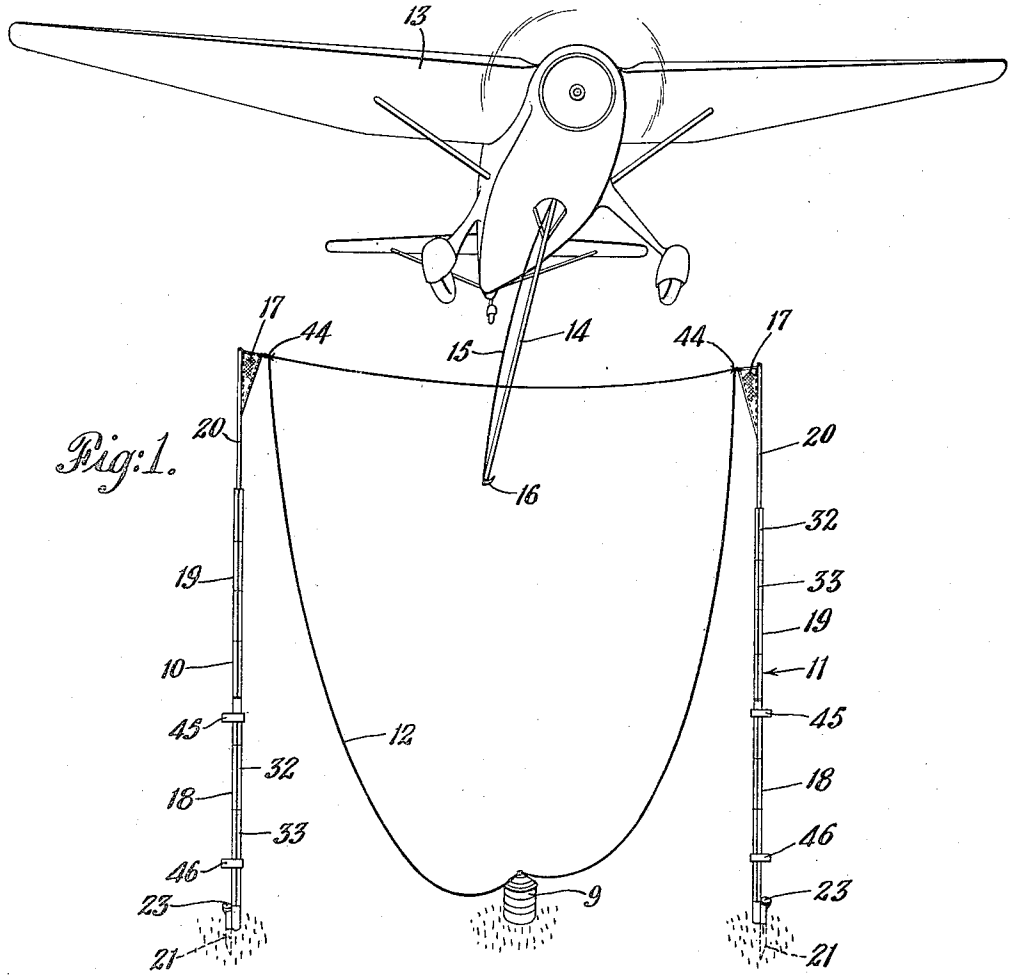


Fig. 1.

Fig. 6.

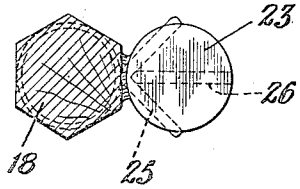
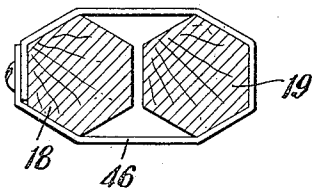


Fig. 7.



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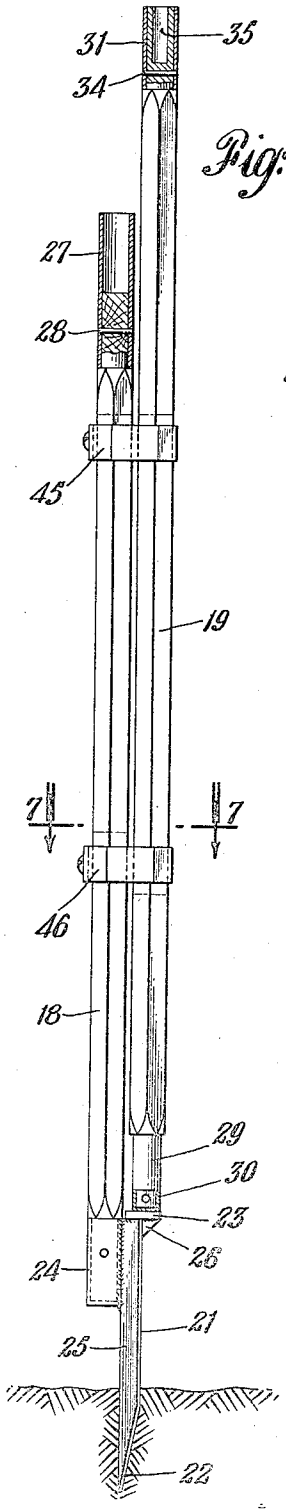


Fig. 2.

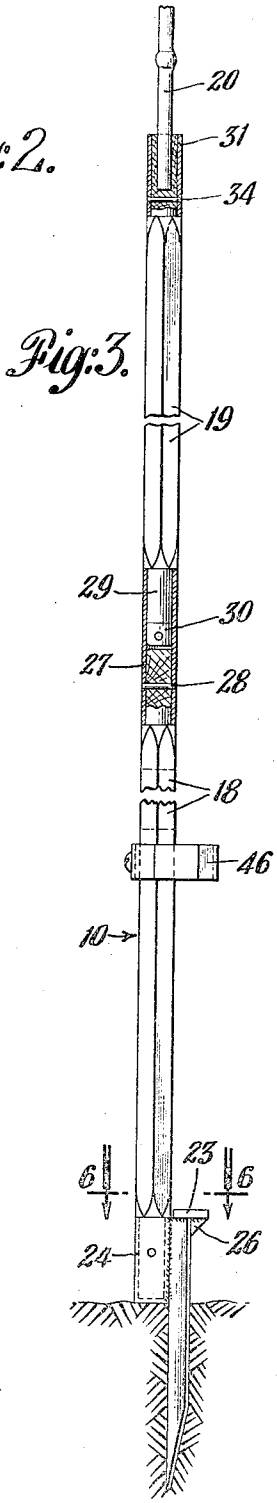


Fig. 3.

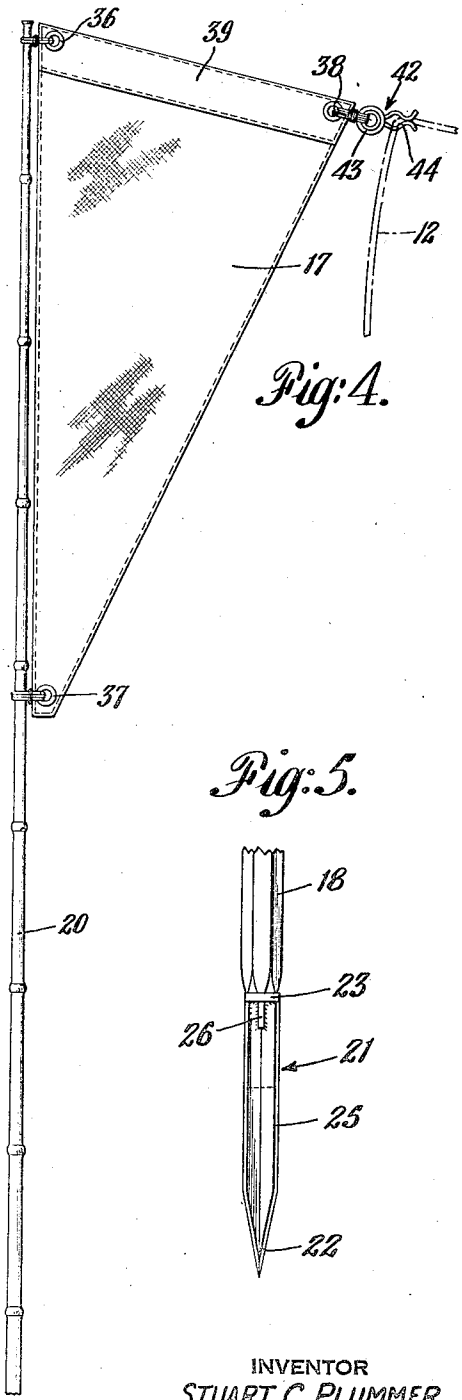


Fig. 4.

Fig. 5.

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Patented Jan. 16, 1945

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UNITED STATES PATENT OFFICE

2,367,607

GROUND STATION FOR AIR PICKUPS

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Application September 23, 1941, Serial No. 411,961

7 Claims. (Cl. 258—1.2)

The invention relates to ground stations for air pick-up systems and more particularly to ground stations utilizing a transfer rope stretched between two poles.

According to a preferred form of the invention the ground station comprises a set of poles, each of which is of sectional construction and has a pointed stake to facilitate setting up and taking down the poles. Each pole may conveniently comprise three sections connected together by telescopic couplings. The lower and intermediate sections may be of sturdy construction to give the poles sufficient rigidity to hold the transfer rope in substantially fixed position. The upper sections may be of thin or frangible material, so that if, by accident, the aircraft should engage the poles, they will easily give or break without injuring the aircraft. The lower sections may have the stakes secured in overlapping relationship thereto, exposing their upper ends to facilitate driving into the ground by a hammer or other suitable device. If desired, the lower sections may be provided with rings or other guiding devices in line with the stake so that the intermediate sections may be used as a hammer to drive the stakes into the ground.

A further feature of the invention is the utilization of the signal flags at the top of the poles to support the transfer rope thereby holding the signal flags in the plane of the poles to make them more easily visible to the aircraft which is to pick up the load.

The invention also consists in certain new and original features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which

Fig. 1 is a diagrammatic representation of a ground station according to the invention, showing an airplane about to pick up the load.

Fig. 2 is a vertical elevation illustrating one manner of driving the poles into the ground.

Fig. 3 is a vertical elevation, partly in section, of a ground pole set up.

Fig. 4 is a vertical elevation of the frangible top section of the pole showing the flag attached thereto.

Fig. 5 is a fragmentary detail illustrating the construction of the lower section and stake.

Fig. 6 is a section of line 6—6 of Fig. 3, and

Fig. 7 is a section of line 7—7 of Fig. 2.

Like reference characters denote like parts in the several figures of the drawings.

In the drawings accompanying and forming part of this specification, certain specific disclosure of the invention is made for purposes of explanation, but it will be understood that the details may be modified in various respects without departure from the broad aspect of the invention.

Referring now to the drawings and more particularly to Fig. 1, the ground station comprises, generally, two poles 10 and 11 driven into the ground, having flags 17 attached thereto, and a ground or transfer rope or loop 12 attached to the flag by releasing links 44. The ground rope 12 is in the form of a loop passing through an eye on the load or burden 9 resting on the ground. The load 9 is indicated as a mailing pouch of sufficient capacity to hold considerable mail, but if desired the load may constitute a single pocket for a single message in the event the system is used for example for picking up messages for military purposes.

The aircraft is shown as an airplane 13, having a depending arm or boom 14 suitably secured to the underside of the fuselage, and having a pick-up rope 15 provided with a hook or grapple 16 adapted to engage the ground loop 12 for picking up the load 9. It will be understood that other forms of pick-up mechanism may be used on the aircraft as, for example, a simple line let out of the airplane and having a simple hook or other pick-up device secured to the lower end thereof.

Referring now to the other figures, the ground poles 10 and 11 are identical so it is only necessary to describe one in detail. Each pole comprises a lower section 18, an intermediate section 19 and a top section 20. The lower and intermediate sections 18 and 19 may be of sturdy construction, sufficiently heavy to impart the necessary rigidity to the poles but sufficiently light for portability. Light metals such as aluminum or other material such as wood, shown for purposes of illustration, answer this requirement satisfactorily. The top section 20 is made of a light frangible material, such as bamboo, which will break or bend readily in case the aircraft should accidentally strike it without injury to the aircraft.

Lower wooden section 18 has a metal socket

or cup 24 suitably pinned or otherwise secured to the reduced lower end thereof. Suitably welded to the socket 24 is an iron stake 21, having a body 25 of angle iron stock with its lower end tapering to form point 22. The top of the body 25 has an anvil 23 suitably welded thereto and connected by a suitable gusset stay 26 for strength. The stake 21 is secured to the socket 24 in overlapping relation to place the anvil 23 in a convenient position for driving the stake into the ground by a hammer or other suitable device.

The wooden intermediate section 19 has a reduced lower end 29 and may also have a metal socket 30 suitably pinned thereto for purposes hereinafter described more in detail. The upper end of lower section 18 is reduced and is provided with a sleeve 27 suitably pinned thereto, as by pin 28, to receive telescopically the intermediate section. The upper end of the intermediate section 19 is reduced and provided with a metal sleeve 31 suitably pinned thereto, as by pin 34, and the wooden body has a socket 35 of reduced diameter to receive the lower end of the bamboo upper section 20.

The upper section 20 has the flag 17 secured thereto. This flag is made of a suitable heavy material, such as canvas, and is of generally triangular configuration suitably stitched around its periphery and provided with a reinforced band 39 along its upper margin. Grommets 36, 37 and 38 are secured to the corners of the flag and wire bindings secure grommets 36 and 37 to the pole 20, engaging the pole with sufficient tightness to prevent them from slipping down. Secured to the grommet 38 by a thong is the releasable fastener 42, which comprises a ring 43 having projecting therefrom spring clips 44, having rounded engaging fingers, and a recess through which the ground loop 12 passes. It will be understood that the fingers of releasable fastener 42 engage with sufficient pressure to hold the ground loop 12 in the position shown in Fig. 1 for picking up the load, but when the loop 12 is engaged by the pick-up device on the aircraft, the rope 12 easily slides between the fingers, freeing this rope without damaging the poles or flags.

If desired, arrangement may be made for driving the stakes 21 into the ground without extra apparatus. To this end, the lower section 18 is provided with a set of straps 45 and 46 (see also Fig. 7) suitably secured to the section 18, and forming guides through which the intermediate section 19 may slidably pass. The straps 45 and 46 will be bent to fit the hexagonal configuration of the pole sections. Thus, by holding the lower section 18 in one hand and moving the intermediate section 19 up and down, a series of blows may be caused by engagement of the iron socket 30 against the anvil 23 of the stake 21, by which the stake may be driven into the ground as illustrated in Fig. 2. In some cases, where the ground is soft, the stake 21 may be driven into the ground merely by pressure of the foot on the anvil 23 without requiring the use of any hammering device.

Thus, a ground station is provided which is efficient and reliable and yet of a comparatively inexpensive construction. It is adequately suited for portable use and may easily be carried by an army truck to permit setting up the ground station at different points desired for purposes of strategy. The poles, when set up, may rise about 20 feet above the ground and they may be located about 20 feet apart although, of course, these dimensions may vary somewhat depending upon conditions. To set up the station, it is only necessary to drive the stakes 21 into the ground, then engage the ground rope 12 with the releasable connections 44 and with the load 9, then place the upper sections 20 in the sockets 35 and the intermediate sections 19 in the sockets of sleeves 27. The ground station may just as easily be taken down by reversing the setting-up operation. In some cases, where portability is not desired, the stakes 21 may be dispensed with and permanent sockets (not shown) mounted in the ground in which the sockets 24 on the lower sections 18 may be inserted.

The flags 17 have the structural duty of supporting the ground wire or loop 12. The grommets 36 and 38 are located in the reinforcing band 39 and thus the flags are sufficiently strong to perform this duty. This arrangement has also the important advantage of automatically holding the flags 17 in the plane of the poles 10 and 11, transverse to the direction of travel of the aircraft picking up the load. This places the flags in the position of maximum visibility regardless of the direction of the wind. The flags may be of international orange color and the poles may be painted in wide bands of international orange and white as indicated by 32 and 33 in Fig. 1 to improve visibility. The relatively sturdy construction of the intermediate and lower sections imparts sufficient rigidity to prevent swaying in the wind, and to hold the ground loop 12 in moderately fixed position, while the bendable or frangible nature of the top sections 20 provides a safety measure, avoiding damage to the aircraft in case it should accidentally hit the tops of the poles.

In addition, the flage are so shaped that the load imparted thereto by the pick-up loop is distributed to the two points by which the flags are attached to the upper section. Thus while the upper sections are relatively weak they will not be bent by the weight of the loop.

While certain novel features of the invention have been disclosed herein, and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. In an air pick-up system, spaced ground poles having their lower ends affixed to the ground and having flags attached to their upper ends, said flags having one edge thereof attached to the poles, another edge having a releasing link, a transfer rope comprising a closed loop passing through said releasing links and having an upper ply adapted to be engaged by an aircraft pick-up device and a lower ply extending toward the ground, a load attached to said lower ply, said transfer rope holding the plane of said flags transverse to the direction of flight of the aircraft.

2. In an air pick-up system, spaced ground poles having their lower ends affixed to the ground and having flags attached to their upper ends, said flags being of substantially triangular configuration and having one edge thereof attached to said poles, the opposite corner having a releasing link, reinforcing means along the upper edge of said flags, a transfer rope comprising a closed loop passing through said releasing links, said rope having an upper ply adapted to be engaged by an aircraft pick-up device and a lower ply extending toward the ground, a load attached to said lower ply, said transfer rope holding the

plane of said flags transverse to the direction of flight of the aircraft.

3. In an air pick-up system, spaced ground poles having their lower ends affixed to the ground and having flags attached to their upper ends, a transfer rope connecting said flags and holding the plane of said flags substantially in the plane of said poles.

4. In a portable ground station for air pick-up systems comprising two poles with a transfer line stretched therebetween, each pole comprising a lower and an upper section, said sections having couplings detachable from each other on the adjoining ends thereof to normally hold the sections assembled, a pointed stake having an exposed anvil rigidly secured to the lower end of said lower section in overlapping relation, one of said sections having guide devices attached thereto adapted to receive the other section whereby the upper section may be used as a hammer engaging the anvil to drive the stake into the ground, after which the sections are assembled by their detachable couplings.

5. In a portable ground station for air pick-up systems comprising two poles with a transfer line stretched therebetween, each pole comprising a lower, an intermediate and an upper section, said sections having telescoping couplings detachable from each other on the adjoining ends thereof to normally hold the sections assembled, the lower and intermediate sections being of sturdy construction and the upper section being of considerably weaker material, a pointed stake having an exposed anvil rigidly secured to the lower end of said lower section in overlapping relation, said lower section having guide rings attached thereto adapted to receive the intermediate section whereby the intermediate section may be used as a hammer engaging the anvil to drive the stake into the ground, after which the sections are assembled by their detachable couplings.

6. In a pick-up station for air pick-up systems, spaced poles, flags attached to the upper ends of said poles at a plurality of points, and a transfer loop releasably attached to and supported by the flags, said flags transmitting stress from the loop to the poles at said plurality of points.

7. In an air pick-up system, a base surface, spaced poles having their lower ends affixed to said base surface and having flags attached thereto, a transfer rope connecting said flags and holding the plane of said flags substantially in the plane of said poles.

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