May 3, 1932. L. VINGHEROETS 1,856,446

AIRPLANE LOADING STATION

Filed March 8, 1929 4 Sheets-Sheet 1

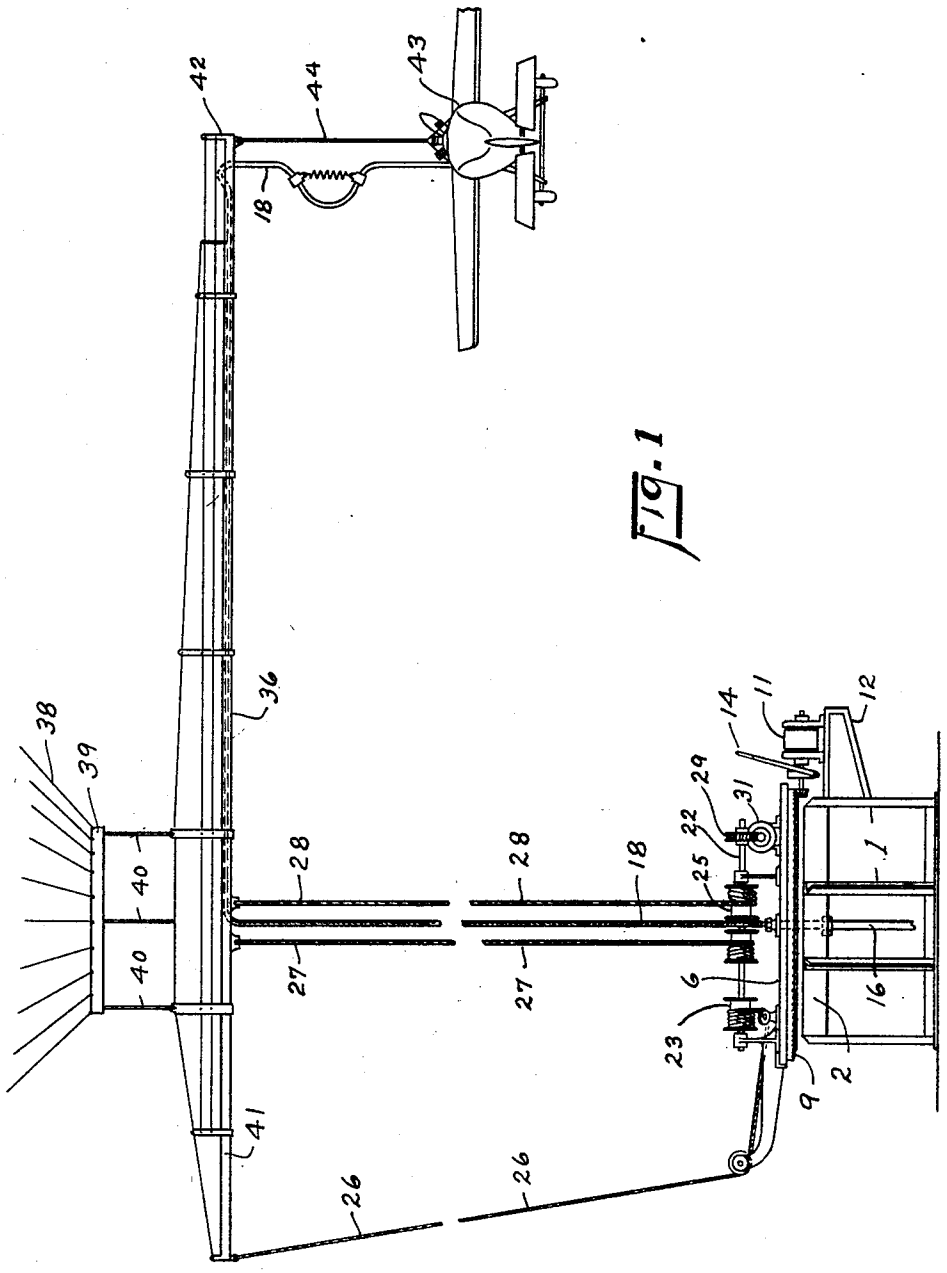

FIG. 1

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Filed March 8, 1929 4 Sheets-Sheet 2

FIG. 2

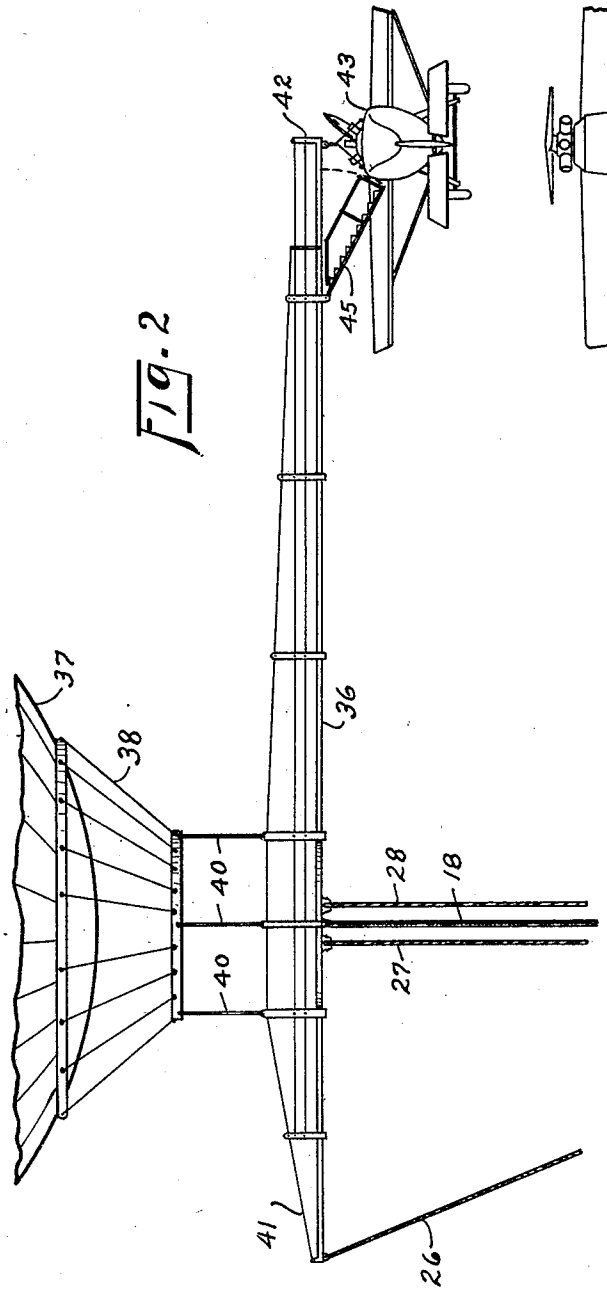
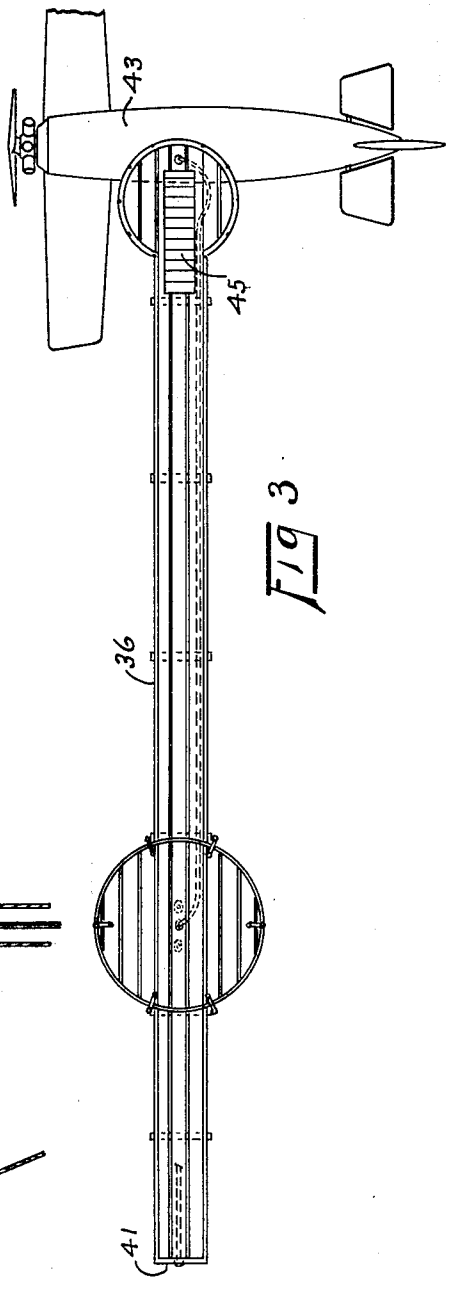


FIG 3



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Filed March 8, 1929 4 Sheets-Sheet 3

Fig. 4

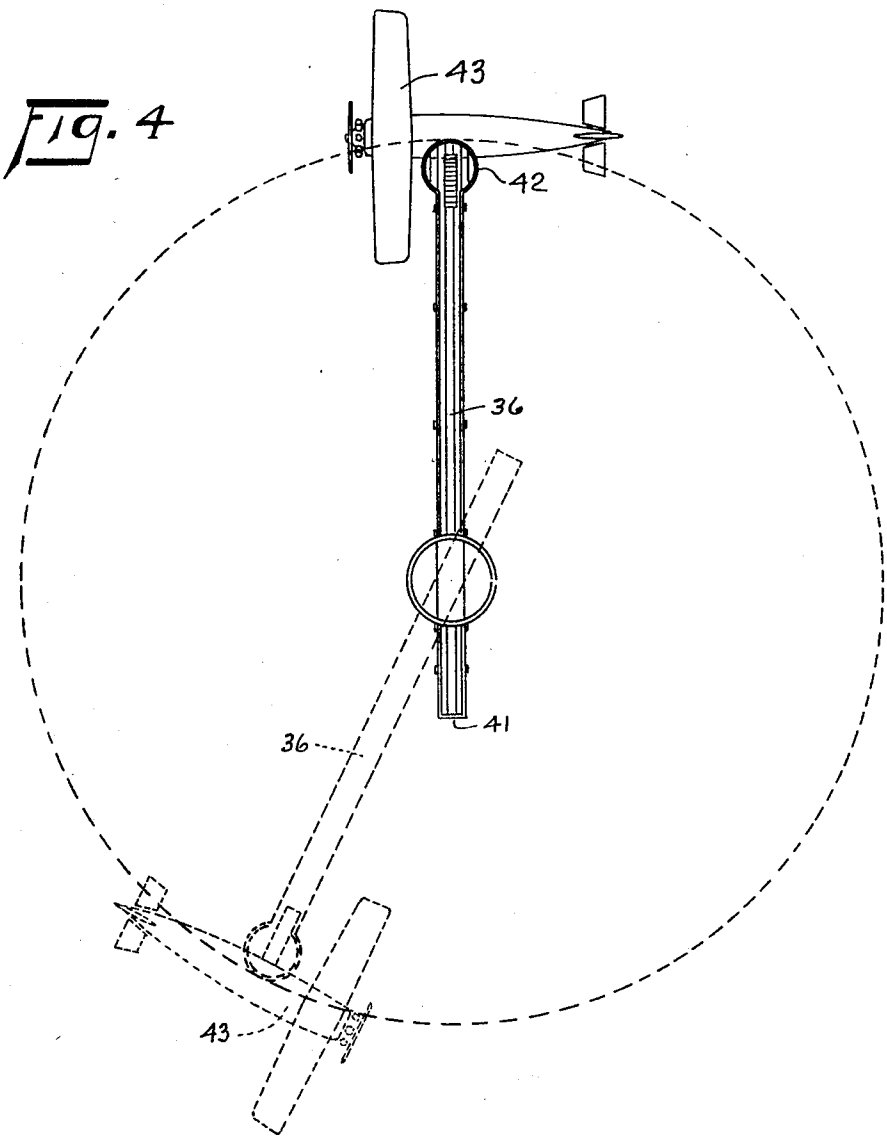

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Fig. 5

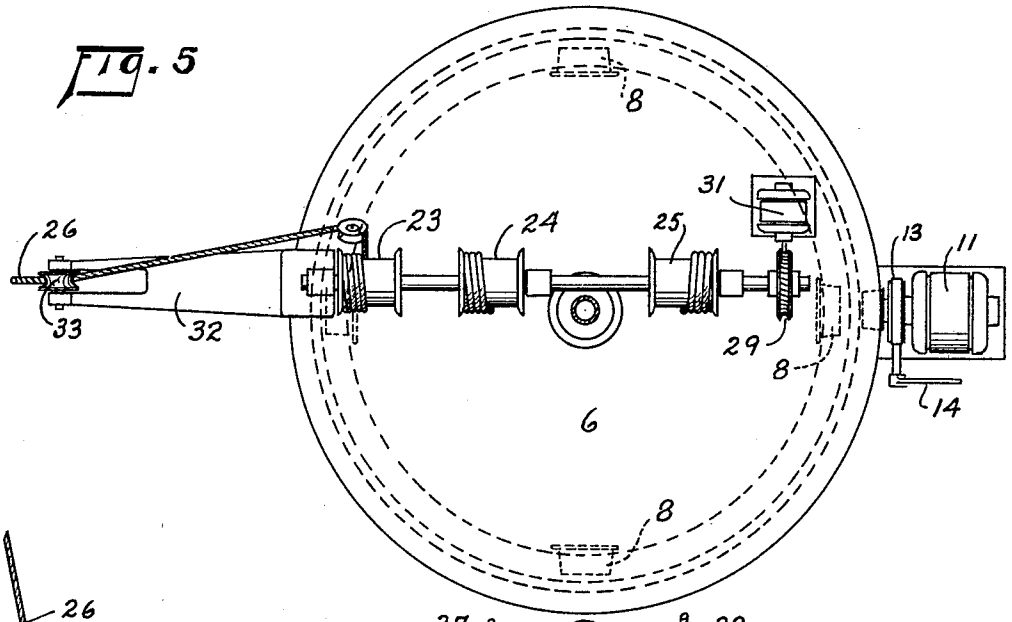
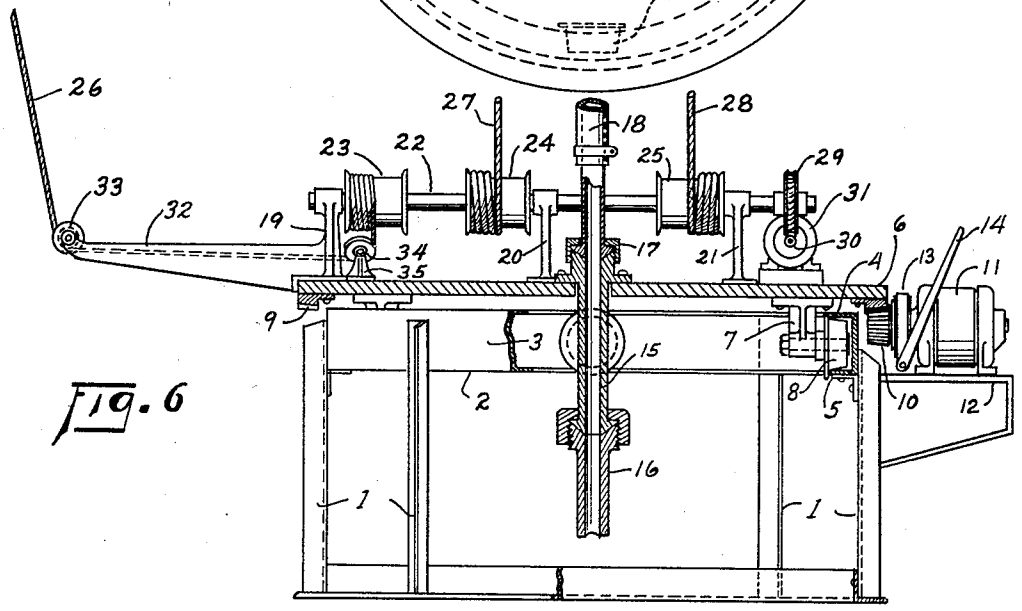


Fig. 6



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UNITED STATES PATENT OFFICE

LOUIS VINGHEROETS, OF GRAND RAPIDS, MICHIGAN

AIRPLANE LOADING STATION

Application filed March 8, 1929. Serial No. 345,427.

This invention relates to an airplane loading station.

The main objects of this invention are to provide an improved loading station for airplanes whereby the planes can refuel and take on passengers, mail and freight while in mid-air without necessitating the landing of the plane; to provide a loading station which is freely suspended in the air by means of a balloon as distinguished from structures supported on rigid towers and the like; and to provide a loading station which is adapted to be built upon the ground or carried upon a motor truck or upon a boat.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:

Fig. 1 is a fragmentary view in elevation of the improved airplane loading station with the supporting balloon broken away and with an airplane contacting with the station and being supplied with gasoline.

Fig. 2 is a view of the gangplank or arm supported by the balloon with an airplane contacting therewith in position to take on passengers or freight.

Fig. 3 is a plan view of the same.

Fig. 4 is a plan view of the gangplank with an airplane contacting therewith showing its circling movement.

Fig. 5 is a plan view of the turntable platform upon which the anchoring cable winches are carried.

Fig. 6 is a view of the same partly in elevation and partly in medial vertical section.

Heretofore many devices have been proposed having for their objects the landing of airplanes on the tops of buildings and the like, the purpose being to permit airplanes to land and take off from the downtown districts of large cities. At the present time the mail planes and the like necessarily have to come in at the landing fields which are generally located many miles from the middle of any large metropolis and much time is consumed in going to and from the landing field from the business districts of these cities. It has been well recognized that it would be of vast importance and of great benefit if it were possible for airplanes to make contact in the heart of business districts for the purpose of taking on or unloading passengers, mail and the like.

By use of the present invention, it is possible for airplanes to fly directly to the heart of business districts and there make contact with my improved loading station which loading station may be mounted on the top of any building without regard to its having a large roof area. Furthermore, loading stations of my improved design may be mounted upon motor trucks and thereby rendered mobile for use in warfare, also on boats and ships in mid-ocean, anchored or otherwise. Every ship afloat at the present time could be equipped with a loading station of this character and airplanes making transoceanic flights could thereby follow the usual shipping lanes and refuel by giving appropriate signals to whatever ship they might sight without landing of the plane on the said ship.

In the construction shown in the drawings, my improved invention comprises a structural framework 1 which supports in a horizontal plane a circular trackway 2. The trackway 2 is in the form of a channel iron arranged with the web 3 in a vertical plane and with the flanges 4 and 5 facing inwardly toward the center of the trackway. A turntable platform 6 is rotatably mounted on the trackway 2 by having a plurality of depending brackets 7 on the under side upon which are journalled rollers or wheels 8. The rollers 8 extend into the loosely fit between the upper and lower flanges 4 and 5 of the channel trackway 2.

The under side of the platform 6 around its marginal edge is provided with a circular toothed ring gear 9 which meshes with a pinion gear 10 on the shaft of an electric motor 11. The motor 11 is secured to a supporting bracket arm 12 which is rigidly mounted on the framework 1. The shaft of the motor 11 is also provided with a brake and brake drum 13 for the purpose of retarding rotation of the platform, the brake band of which is contracted by a brake lever or handle 14.

The center of the platform 6 is provided

with a vertically disposed pipe coupling 15, the lower end of which is swivelly mounted on the upstanding end of a supply pipe 16 which may be in communication with any suitable source of gasoline or other motor fuel.

The upper end of the coupling 15 is provided with a hose connection 17 to which is swivelly coupled the lower end of a flexible gasoline hose 18.

The platform 6 also supports a horizontally disposed multiple drum winch which comprises upstanding bearing brackets 19, 20 and 21 bolted to the platform at their lower ends and having aligned boxings in their upper ends in which is journalled a line shaft 22. The line shaft 22 has rigidly mounted thereon cable drums 23, 24 and 25 which receive and are adapted to have wound thereon suitable cables 26, 27 and 28 respectively. The winch line shaft 22 has a worm gear 29 keyed thereto which is driven by a worm 30 on the armature shaft of an electric motor 31 which is also mounted on the platform 6.

The shaft supporting bracket 19 is provided with a horizontally disposed radially extending arm 32, the outer end of which has a cable shive 33 journalled therein around which the cable 26 passes and a second cable shive 34, mounted on an upstanding bracket 35, is mounted on the platform near the middle and to one side of the cable drum 23 for guiding the cable 26 on to said drum.

The cables 26, 27 and 28 are attached to and anchor to the platform a substantially horizontally disposed gangplank or arm 36 which is supported and normally held in spaced relation to the earth by a balloon 37 whose netwark 38 is attached to a ring 39. The ring 39 is in turn secured by a standard 40 to the gangplank 36.

The gangplank 36 is supported by the balloon closely adjacent one end thereof and the anchoring cables 27 and 28 are attached thereto directly under the point of attachment of the balloon 37. The short end 41 of the gangplank has the anchor cable 26 attached to the outer end thereof for counterbalancing the longer end of said gangplank which extends outwardly a considerable distance.

The gasoline hose 18 extends upwardly along the cables 27 and 28 and then outwardly on the gangplank 36 to the outer free end 42 thereof thence downwardly through an opening in the gangplank so that gasoline may be supplied to an airplane 43 which is attached to the end 42 of the gangplank by a cable 44.

The outer end 42 of the gangplank 36 is also provided with a stairway 45 hinged thereto at one end which may be lowered as shown in Fig. 2 of the drawings so that passengers or freight and express matter may be loaded into the airplane 43 when drawn up into close relation to the end of the gangplank.

In the operation of this airplane loading station, the balloon 37 normally supports the gangplank 36 in substantially horizontal position several hundred feet in the air, the cables 26, 27 and 28 anchoring the balloon and gangplank to the rotatable platform 6. When it is desired to have an airplane make contact with the loading station, electric motor 11 is operated so as to turn the platform 6 and thereby rotate the gangplank 36 and balloon 37 mainly through the pull of the cable 26 which is attached to the outer end 41 of the gangplank. When the gangplank has attained a speed of somewhat the same as the flying speed of the airplane, the cable 44 attached to the outer swinging end 42 of the gangplank is picked up by the airplane and attachment made thereto.

If only gasoline is to be loaded, the plane continues its flight in a circle somewhat as shown in Fig. 4 of the drawings, it being readily apparent that slight variations in the course of the plane are compensated for by the flexible cable 44 which attaches it to the platform and also by reason of the fact that the ballon and gangplank are freely floating about in the air and may sway off to one side or another depending upon the pull of the airplane. The hose 18 is passed to the gasoline tank of the airplane and opened and thereby a supply of gasoline taken aboard.

If passengers or freight or mail matter is to be loaded on the airplane, after it has made contact with the loading station and become attached to the cable 44 it is drawn up into close proximity to the outer end 42 of the gangplank at which time the stairway 45 is lowered as shown in Fig. 2 of the drawings and mail matter, freight and express matter or even passengers loaded into the plane while it continues it flight round and round.

After the plane takes on fuel or is loaded and disconnects from the outer end of the gangplank, the entire landing station may be quickly brought to a standstill by application of the brake 13 and the balloon and gangplank supported thereby may be quickly drawn down close to the platform 6 by operation of the winch mounted on said platform.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. An airplane loading station comprising a substantially horizontally disposed arm having one end adapted to be connected to an airplane, a balloon attached to said arm for supporting it in the air, flexible cables for

anchoring said arm and balloon to the earth, and means for rotating the horizontal arm at substantially airplane speed, the flexible cables permitting lateral swaying of the arm to yield to airplane pull.

2. An airplane loading station comprising a turntable platform, a balloon, flexible cables anchoring said balloon to said platform, an arm supported by said balloon having one end thereof adapted to be connected to an airplane, and means for rotating the said arm at substantially airplane speed.

3. An airplane loading station comprising a turntable platform, a balloon, a winch mounted on said platform, cables on said winch connected to said balloon, an arm supported by said balloon having one end thereof adapted to be connected to an airplane, and means for rotating the said arm at substantially airplane speed, the said cables permitting lateral swing of the arm to permit the same to yield to airplane pull.

4. An airplane loading station comprising a turntable platform, means for rotating said platform, a multiple drum winch on said platform, a balloon, cables connecting said winch drums with said balloon, an arm supported by said balloon having one end thereof adapted to be connected to an airplane, and means for rotating the said arm at substantially airplane speed, the said cables permitting lateral swaying of the arm to enable the same to yield to airplane pull.

5. An airplane loading station comprising a turntable platform, means for rotating said platform, a brake for retarding the rotation of said platform, a multiple drum winch on said platform, a balloon, cables connecting said winch drums with said balloon, an arm supported by said balloon having one end thereof adapted to be connected to an airplane, and means for rotating the said arm substantially at airplane speed, the said cables permitting lateral swaying of the said arm to yield to airplane pull.

6. An airplane loading station comprising a balloon, a gangplank supported by said balloon, means for anchoring said balloon to the earth, and a stairway section pivoted on said gangplank adjacent the outer end of the latter and located beneath and extending downwardly and outwardly from the said gangplank.

In testimony whereof I have hereunto set my hand at Grand Rapids, Michigan, this 5th day of March, 1929.

LOUIS VINGHEROETS.