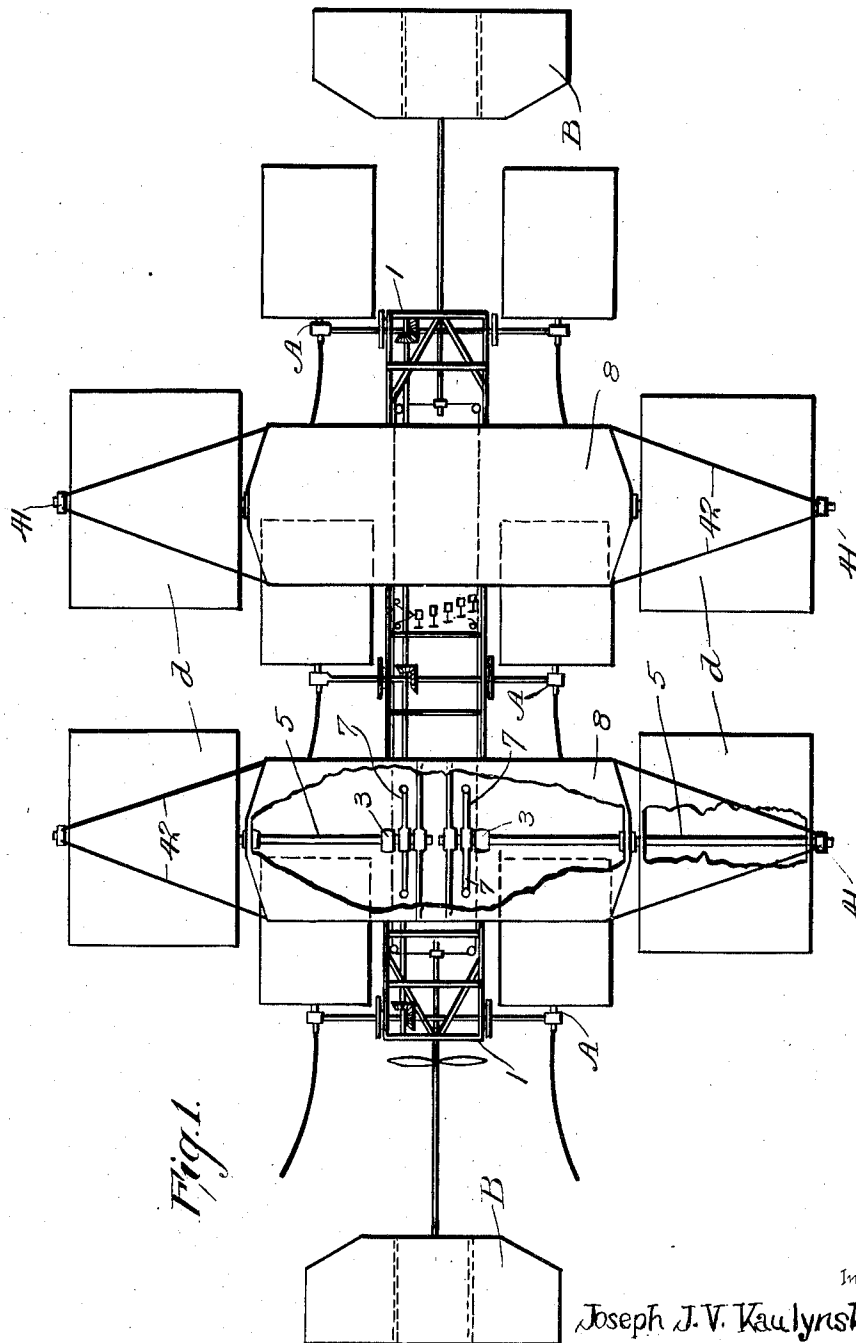


J. J. V. KAULYNSKAS.
AEROCRAFT.
APPLICATION FILED OCT. 29, 1910.

1,013,851.

Patented Jan. 2, 1912.

4 SHEETS—SHEET 1.



Witnesses
Grant C. Osborne
Agnes C. Casky

Inventor
Joseph J. V. Kaulynskas
By
William B. Jackson.
Attorney

J. J. V. KAULYNSKAS.
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4 SHEETS—SHEET 2.

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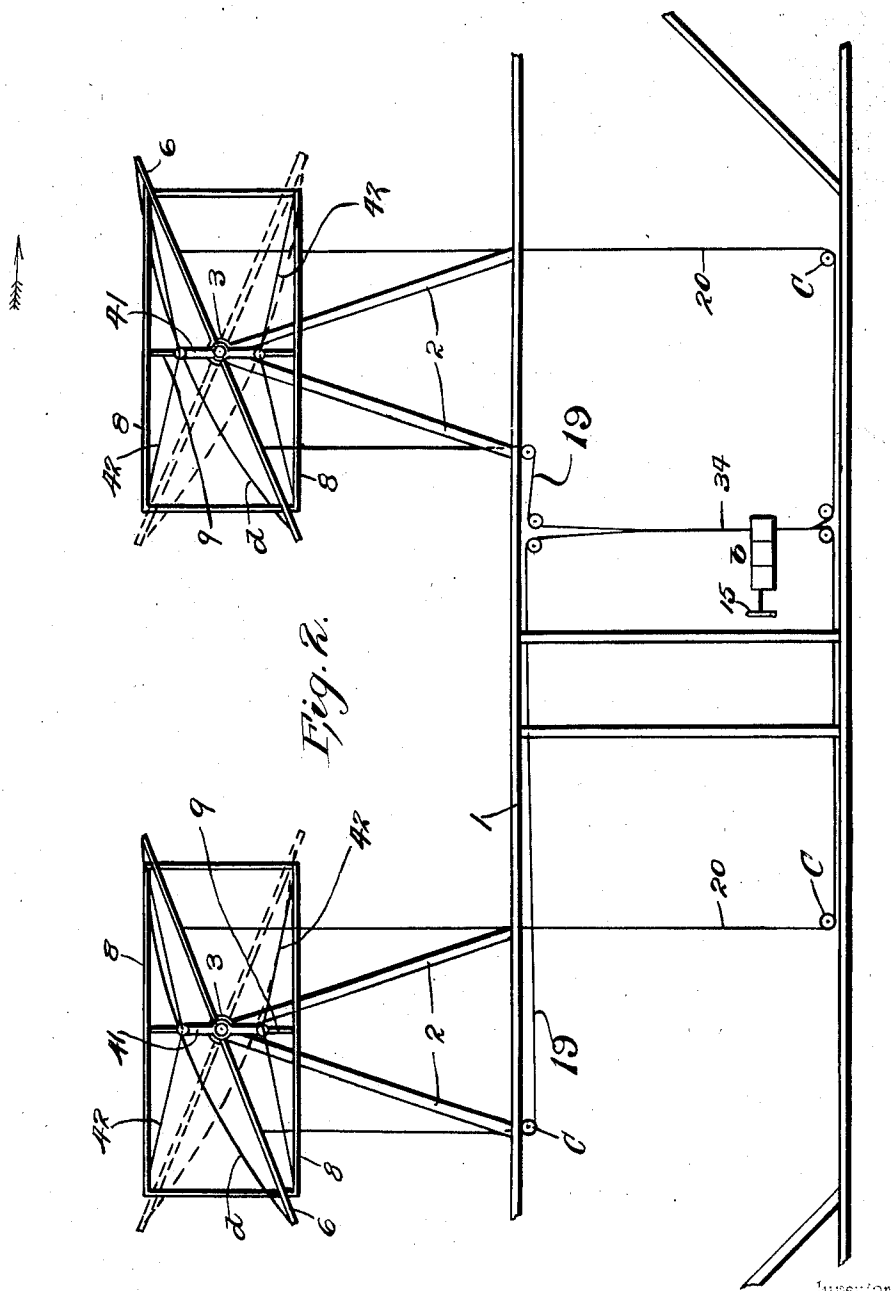


Fig. 2.

Joseph J. V. Kaulynskas

Witnesses
Grant Osborne
Agnes C. Conkey

By

William E. Jackson.
Attorney

J. J. V. KAULYNSKAS.
AEROCRAFT.

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4 SHEETS—SHEET 3.

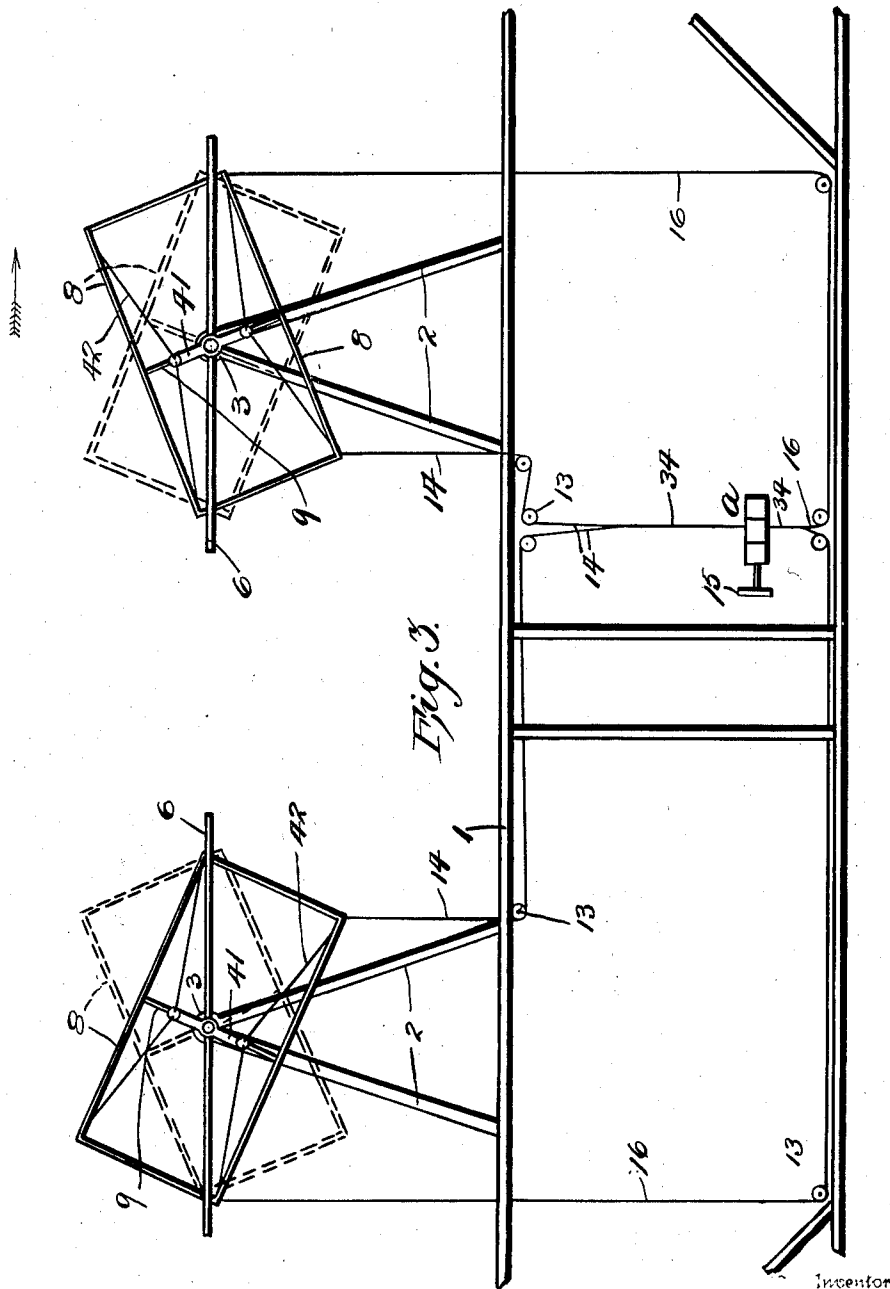


Fig. 3.

Witnesses
Grant C. Osborne
Agnes C. Caskey

Inventor
Joseph J. V. Kaulynskas
By
William D. Jackson,
Attorney

J. J. V. KAULYNSKAS.
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4 SHEETS-SHEET 4.

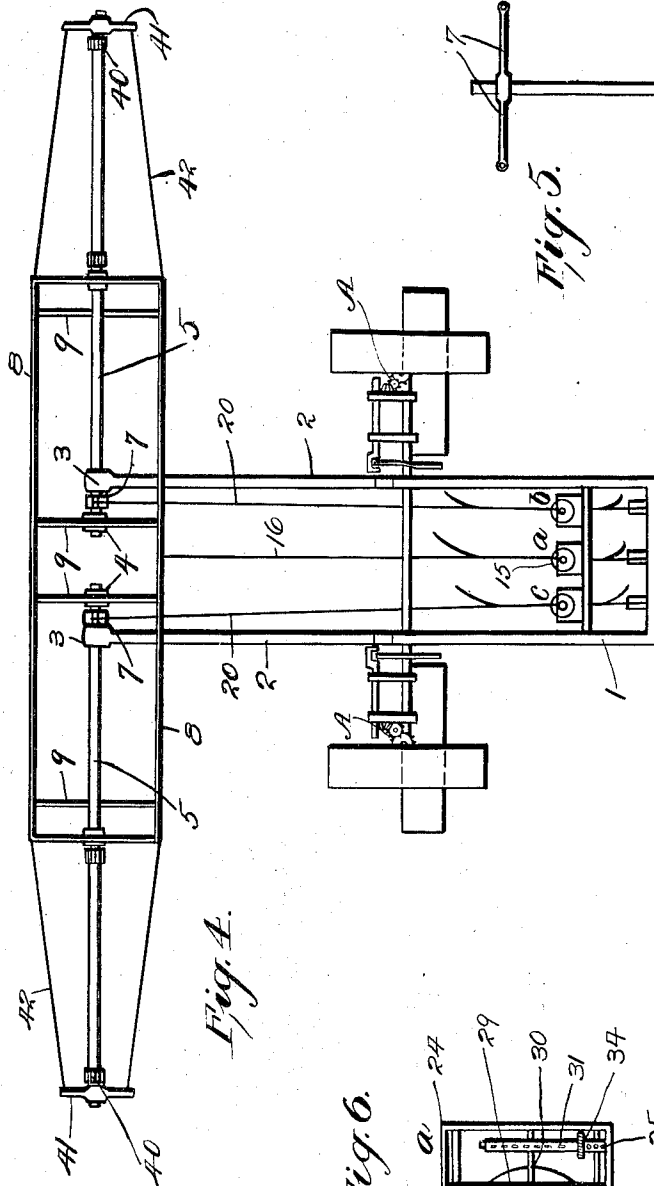


Fig. 4.

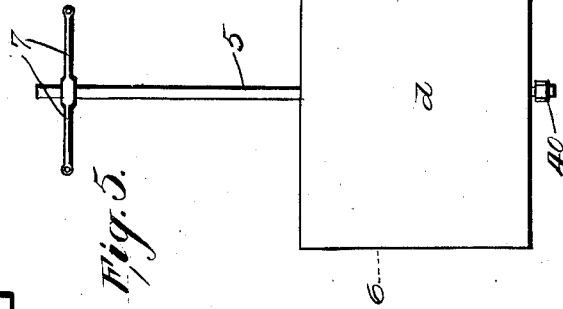


Fig. 5.

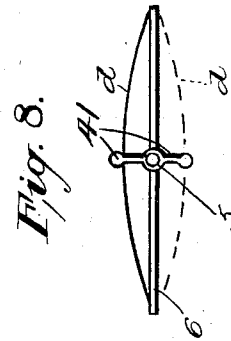


Fig. 8.

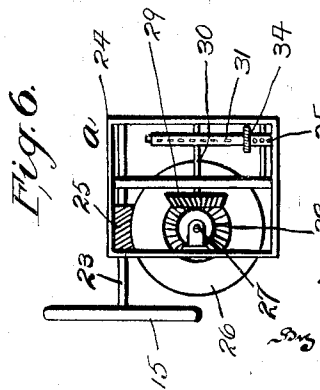


Fig. 6.

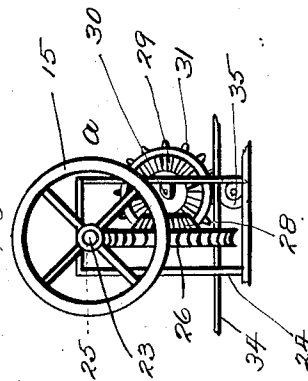


Fig. 7.

Witnesses
Frank C. Osborne
Agnes C. Caskey

Inventor
Joseph J. V. Kaulynskas

William E. Jackson.
Attorney

UNITED STATES PATENT OFFICE.

JOSEPH J. V. KAULYNSKAS, OF PHILADELPHIA, PENNSYLVANIA.

AEROCRAFT.

1,013,851.

Specification of Letters Patent.

Patented Jan. 2, 1912.

Original application filed January 21, 1910, Serial No. 539,329. Divided and this application filed October 29, 1910. Serial No. 589,734.

To all whom it may concern:

Be it known that I, JOSEPH J. V. KAULYNSKAS, a subject of the Czar of Russia, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Aerocraft, of which the following is a specification.

This invention relates to that class or type of flying machine known as heavier-than-air machines; which when driven at considerable speed will be buoyed or sustained by pressure of the atmospheric air and has more particular relation to the apparatus disclosed in my application for Letters Patent, filed January 21, 1910, serially numbered 539,329.

This invention has for its principal object to construct apparatus comprising a structure combining lightness, strength and efficiency, provided at its top with fore and aft spaced parallel planes forming compound planes for guiding the framework either upward or downward and capable of being tilted at different angles to one another simultaneously by the operator from one steering wheel.

A further object of the present invention is to equip each of the fore and aft planes upon each side thereof with auxiliary or single balancing planes, the single planes of each pair of which are connected so as to be tilted at the same angle simultaneously by the operator from one steering wheel.

The invention has for its still further objects the providing of such other and further improvements and devices as are shown in the drawings and hereinafter referred to for causing the apparatus to meet the different conditions involved in rising, descending or maintaining flight at a constant level.

The invention consists of the improvements hereinafter referred to and finally claimed.

The nature, characteristic features, and scope of the invention will be more fully understood from the following description taken in connection with the accompanying drawings, forming part hereof and in which:

Figure 1, is a view in plan of the aerocraft equipped with the various planes embodying the invention, Fig. 2, is a view in side elevation, illustrating in full and dotted lines the manner of manipulating the auxiliary or balancing planes, Fig. 3, is a

similar view illustrating the manner of manipulating the main or compound planes of the apparatus, Fig. 4, is a view in end elevation of the apparatus, Fig. 5, is a detail view drawn to an enlarged scale illustrating one of the auxiliary planes, Fig. 6, is a view in side elevation of one of the steering wheels employed for changing the angular positions of the planes of the invention, Fig. 7, is a view in front elevation of Fig. 6, and Fig. 8, is a view in side elevation of one of the auxiliary planes illustrating in full and dotted lines the manner in which concave and convex surfaces are provided by virtue of air impinging against the canvas coverings of said planes.

In the drawings, the framework 1, of the apparatus may be constructed of any desired material preferably of generally elongated rectangular configuration, and the propelling mechanism A, and rudders B, may be of the type disclosed in my application for Letters Patent aforesaid or of other design. It is thought that description thereof is not necessary as they do not form subject matter of this application. Surmounting the framework 1, are two pairs of standards or up-rights 2, arranged substantially fore and aft of the apparatus. These standards or up-rights 2, terminate in bearings 3. Each pair of standards 2, is designed to pivotally support the planes, the central planes of which are of compound construction and the side or auxiliary planes are of single construction. As shown in the drawings, the central or compound planes are disposed crosswise of the apparatus and are adapted to be tilted or shifted at different angles simultaneously by the operator from one steering wheel so that various angular positions may be obtained in addition to a normally horizontal position. As clearly illustrated in Fig. 4, these main planes comprise horizontally disposed spaced planes 8, braces 9, being present for effecting the spacing thereof. These braces 9, are provided with bearings 4.

Extending crosswise of the apparatus and through the bearings 3, of the standards 2, and the bearings 4, of the braces 9, are shafts 5, said shafts being capable of turning as hereinafter described. The central or compound planes as a whole are movable with respect to the shafts 5, and are connected together so that the operator may

effect a simultaneous tilting thereof at different angles to one another from one steering wheel, a description of which will now be given, particular reference being had to Figs. 3, 4, 6, and 7.

Suitably arranged with respect to and supported by the frame 1, of the apparatus and preferably at the base thereof are steering boxes *a*, *b*, and *c*, the steering mechanism of the box *a*, being operatively connected with respect to the central planes and the steering mechanism of the boxes *b*, and *c*, being operatively connected with the auxiliary planes in a manner hereinafter to be described. Referring now to the box *a*, the steering or operating wheel 15, thereof is mounted upon a shaft 23, journaled in a box-like structure 24, and is equipped with a worm gear 25. This worm gear 25, meshes with a gear 26, rotatable with a shaft 27, said shaft 27, being provided with a miter gear 28, which meshes with another miter gear 29, upon a shaft 30. This shaft 30, is journaled in the box 24, and is equipped with a sprocket wheel 31. A sprocket chain 34, is adapted to be operated by the sprocket 31, according to the movement of the steering wheel 15, and an idler 35, is present for keeping the sprocket chain 34, in mesh with the sprocket 31. Operatively connected with one end of the sprocket chain 34, are cables 14, which pass over and under pulleys 13, and connect with the inner portions of the main or central planes as clearly illustrated in Fig. 3. The outer portions of the main or central planes 4, have connected therewith cables 16, which pass under pulleys 13, and connect with the opposite end of the sprocket chain 34. By this construction, it will be obvious that by operating the steering wheel 15, in the proper direction, the main or central planes may be tilted from a position shown in Fig. 2, to the position shown in full or dotted lines in Fig. 3, it being understood that when the main or central planes are in a position shown in Fig. 2, the apparatus is maintaining flight at a constant level in the direction of the arrow; when in a position shown by full lines in Fig. 3, the apparatus is ascending or when in the position shown in dotted lines the apparatus is descending. Thus, it will be readily understood that the main or central planes are connected so as to be simultaneously operated to assume different angles to each other by the operator from one steering box.

Referring now to the side or auxiliary planes, it may be stated that the same comprise single planes in contra-distinction from compound planes. A desirable form of construction consists of a frame 6, covered with loose canvas *d*, or the like, in order that concave-convex surfaces may be provided as air impinges thereon in accord-

ance with the way the planes are tilted. These auxiliary planes have fixed relation with the respective shafts 5, hereinbefore described and are operated from the steering boxes *b*, and *c*, in the following manner. Each of the shafts 5, is provided with fixed arms 7, see Fig. 1, connecting the respective ends of which and the steering wheels are cables. A description will now be given of the manner of connecting the auxiliary planes, upon the right-hand side of the apparatus. Considering the same to be traveling in the direction of the arrow in Fig. 3, for the auxiliary planes on the right-hand side of the apparatus, the steering box *b*, is used which is in all respects similar to the steering box *a*. Connecting the sprocket chain of the steering wheel of the box *b*, and the inner end of the arms 7, of the aft auxiliary plane and the outer end of the arm 7, of the forward auxiliary plane are cables 20, which pass around pulleys C. Connecting the inner end of the arm 7, of the forward auxiliary plane and the outer end of the arm 7, of the aft auxiliary plane are cables 19, which pass around other pulleys C, and connect with the opposite end of the sprocket chain of the steering box *b*. By this arrangement, it will be readily apparent from Fig. 2, that the operator from one steering wheel can tilt the pair of auxiliary planes upon the right-hand side of the apparatus in unison so as to incline in the same general direction in contra-distinction from the tilting of the main or central planes, which are tilted in unison in opposite directions. The auxiliary planes upon the left-hand side of the apparatus are connected in the same manner as above with the steering box *c*, which is identical in structure with the foregoing steering boxes. It may be here remarked that the shafts 5, are provided at their ends with loose collars 40, having arms 41. Connecting the arms 41, and the opposite sides of the central planes are cables 42. This construction serves to support the shaft ends.

In operation the auxiliary planes render the apparatus capable of being easily balanced, thereby eliminating to a great degree the possibility of over-turning of the same. In this connection, it may be remarked for instance, that the auxiliary or balancing planes on one side of the machine, which are entirely independent of the auxiliary planes upon the other side of the machine and also independent of the central planes, may be operated simultaneously to bear upon the air while the auxiliary planes on the other side of the apparatus may be caused to press down upon the air, which obviously is advantageous. By having all of the auxiliary planes in the same position, the apparatus may be caused to glide readily.

What I claim is:

1. In apparatus of the class recited a
main frame, standards surmounting the
frame, a pair of fore and aft compound
5 central planes, tiltably mounted on said
standards, single auxiliary planes tiltably
mounted and connected in pairs upon each
side of the central planes, a separate steer-
ing wheel for each pair of planes, cables
10 connecting each steering wheel, with each
pair of planes, whereby the main planes
may be simultaneously tilted at opposite
angles and the respective pairs of fore and
aft auxiliary planes may be simultaneously
15 tilted at the same angle upon one or both
sides of the apparatus.

2. In apparatus of the class recited, a

main frame, standards arranged fore and
aft of and surmounting the said frame,
bearings for said standards, shafts journaled 20
in said bearings, a pair of compound cen-
tral planes tiltably mounted on said shafts,
auxiliary single planes arranged in pairs
tiltably mounted on said shafts upon each
side of the central planes and means for si- 25
multaneously operating each pair of planes
independently of each of the other pairs of
planes.

In testimony whereof, I have hereunto
signed my name.

JOSEPH J. V. KAULYNSKAS.

Witnesses:

WILLIAM J. JACKSON,
AGNES E. CASKEY.