

S. PALMOWSKI & W. CHWALKOWSKI.

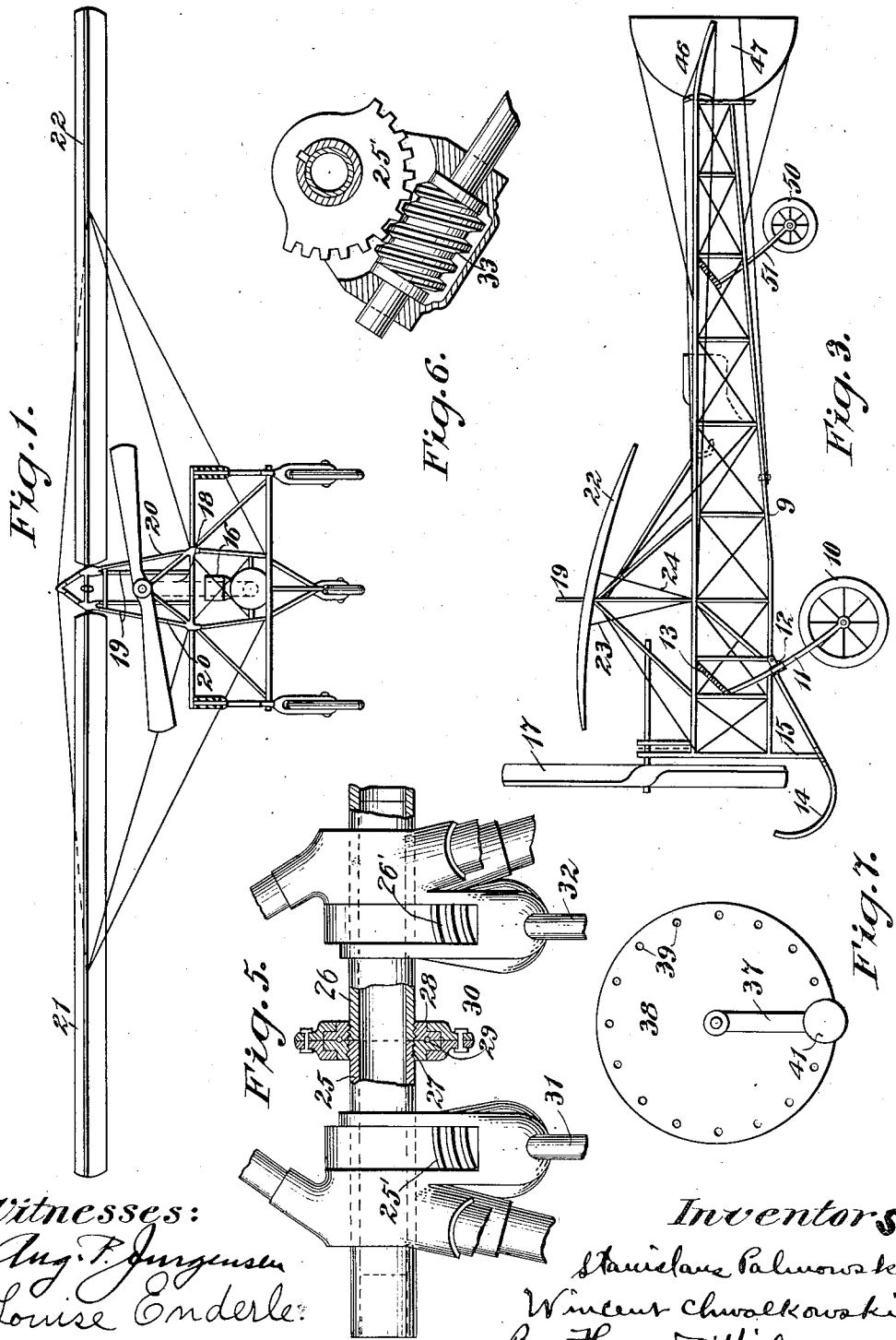
## AERONAUTICAL APPARATUS.

APPLICATION FILED JUNE 14, 1911.

1,069,346.

Patented Aug. 5, 1913.

2 SHEETS—SHEET 1



*Witnesses:*

Aug. P. Jorgensen  
Louise Enderle

## Inventors

Stanislaw Paluszowski  
Wincent Chwalekowski  
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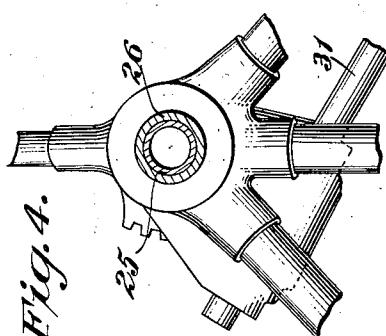
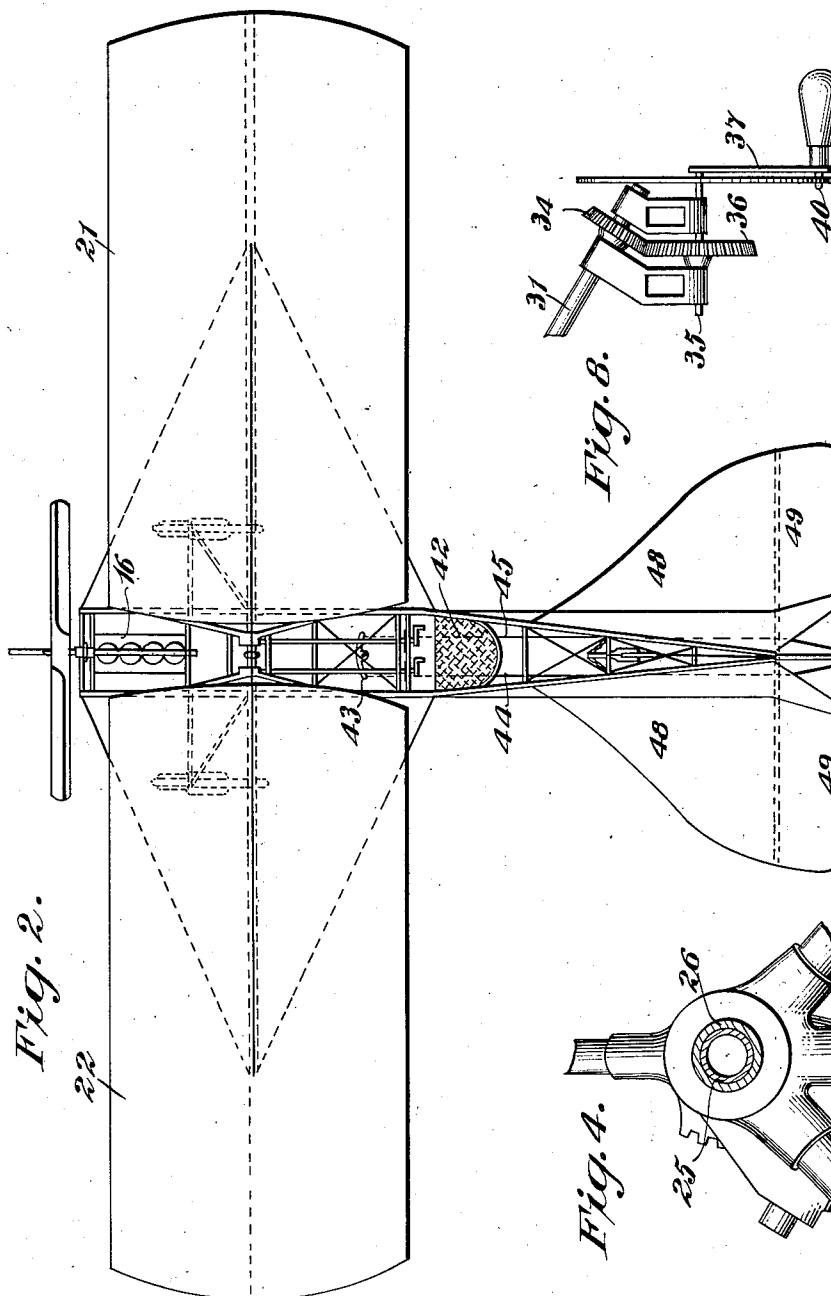
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## *Inventors*

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# UNITED STATES PATENT OFFICE.

STANISLAUS PALMOWSKI AND WINCENT CHWALKOWSKI, OF NEW YORK, N. Y.

## AERONAUTICAL APPARATUS.

1,069,346.

Specification of Letters Patent.

Patented Aug. 5, 1913.

Application filed June 14, 1911. Serial No. 633,176.

To all whom it may concern:

Be it known that we, STANISLAUS PALMOWSKI and WINCENT CHWALKOWSKI, subjects of the Czar of Russia, residing at the 5 borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Aeronautical Apparatus, of which the following is a specification, reference 10 being had therein to the accompanying drawing.

Our invention relates to improvements in aeronautical devices and has particular reference to aeroplanes.

15 The invention has mainly for its object improvements in the general construction and arrangement of the supporting surfaces and control devices more particularly as applied in the monoplane type of aeroplane.

20 In the accompanying drawings I have illustrated a preferred modification of my invention.

Figure 1 is a front elevation of a monoplane type of machine and Fig. 2 is a plan view of the same. Fig. 3 is a side elevation of such a machine. Fig. 4 an enlarged view of part of the frame structure with parts broken away. Fig. 5 a side view of the same with parts broken away showing the method 30 of connecting the main surfaces. Fig. 6 an enlarged view with part broken away illustrating the worm and pinion mechanism shown in Figs. 4 and 5. Fig. 7 a front elevation of the hand lever device for operating the surfaces and Fig. 8 an end view of the same.

9 is the main framework of the machine mounted upon the wheels 10 supported by the shaft frame 11, pivoted at 12 and retained 40 normally in the position shown in Fig. 3 by suitable resilient means such as the spring 13. To this framework may also be secured skids such as 14 and these may be suitably braced to the main body of the 45 machine by uprights such as 15. The engine is preferably mounted in the front of the machine as shown at 16 in Figs. 1 and 2 and preferably driving the propeller 17 by chain connection such as 18 as shown. From the 50 main framework are suitably mounted the uprights 19 suitably supported by braces such as 20 and within these uprights are preferably mounted the inner extremities of the surfaces 21 and 22 which may be rotated 55 upon their longitudinal axes by control cables such as 23 and 24.

The method of mounting and controlling the supporting surfaces is shown to better advantage in Figs. 4 to 8 inclusive. In Fig. 5 the abutting ends of the longitudinal axes 60 of the surfaces 21 and 22 are indicated by reference characters 25 and 26 upon the extremities of which are mounted the collars 27 and 28. These collars are provided with annular grooves to accommodate ball bearings such as 29 as shown and the collars are preferably retained in the outer collar 30 as shown. From this arrangement it will be seen that either surface 21 or 22 may be rotated independently or they may be rotated 70 together. When rotated independently or oppositely the collars 27 and 28 move relatively upon the balls 29 and the combination is retained in position by the outer collar bearing 30. Upon each of the shafts 25—26 75 is suitably keyed or secured gears such as 25'—26' suitably secured within outer casings as shown, said casings also serving as bearings for the shafts 31 and 32 upon the ends of which may be mounted worms such 80 as 33. At the opposite extremities of the shafts 31—32 are also preferably mounted beveled gears such as 34 and the end of the shaft may be retained in a suitable bearing as shown in Fig. 8, said bearing also providing 85 support for the hand crank shaft 35 carrying the beveled pinion 36, so that when the crank 37 is operated the beveled pinion 36 rotates the beveled pinion 34 which in turn drives the worm 33 thereby rotating 90 the gear 25' and the longitudinal shaft 25 of the supporting surface. The disk plate 38 may be held rigid in any suitable manner and may be provided with holes such as 39 to receive the point 40 of the handle 41 95 of the lever 37, so that after rotating a supporting surface it may be retained in the desired position by the engagement of the pin 40 with any desired hole in the plate 38, thus securing the supporting surface at any 100 desired angle.

Of course it will be understood that each surface has a separate hand crank control mechanism and that they may be accordingly operated at will. These hand cranks 105 are preferably located in front of the seat 42 of the operator as indicated in Fig. 2 so as to be within convenient reach of the operator.

43 is a foot control lever having secured 110 at opposite extremities the cables 44 and 45 which pass rearwardly to the verticalrud-

der 46 which may be rotated upon the vertical axis 47 to direct the lateral course of the machine.

48 is the tail of the machine and 49 the 5 movable portion thereof the same being adapted to be raised or lowered at the will of the operator.

It will also be observed that a wheel such as 50 may be provided beneath the rear portion of the main framework upon a suitable shaft such as 51 as shown.

In controlling the machine it will be readily understood that the surfaces may present a positive angle of incidence and the 15 tail a negative angle of incidence to permit of a sharp ascent, or when the surfaces present a positive angle of incidence, the tail may also be given a positive angle of incidence, thus causing the machine to ascend with its longitudinal beam maintained more horizontally according to the will or needs of the operator. It will be further understood that with a construction of this kind the lateral balance of the machine may 20 be controlled by differentiating the angles of incidence of the supporting surfaces on opposite sides of the machine.

Of course it will be understood that vari-

ous other modifications may be made without departing from the spirit of the invention as set forth in the claims. 30

We claim:

In combination with rotatable surfaces of an aeronautical apparatus, axes upon which said surfaces are mounted, said axes having 35 abutting flanges and a guide to retain the same in position, gears upon said axes within outer casings, screws upon shafts mounted within said casings and meshing with said gears, spurs upon the other ends 40 of said shafts meshing with beveled pinions, and means for rotating either of said beveled pinions separately in either direction, said means comprising cranks carrying said beveled pinions and perforated disks 45 adjacent thereto, each of said cranks having a pin to engage the perforations of one of said disks.

In testimony whereof we affix our signatures in presence of two witnesses.

STANISLAUS PALMOWSKI.  
WINCENT CHWALKOWSKI.

Witnesses:

WALTER OLOWINS,  
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