

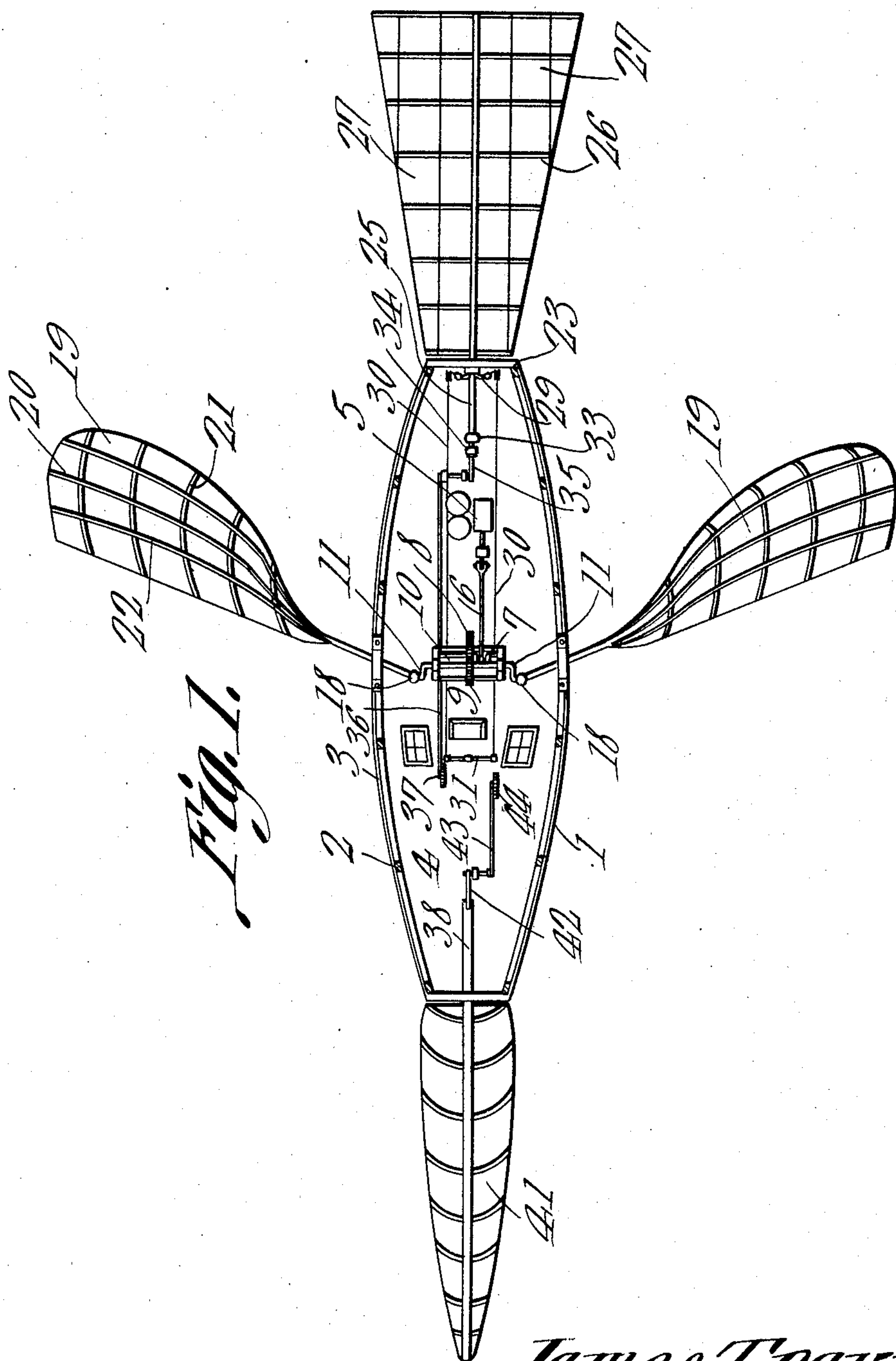
J. TRAVIS.  
AERODROME.

APPLICATION FILED MAR. 7, 1911.

997,521.

Patented July 11, 1911.

3 SHEETS—SHEET 1.



*Fig. 1.*

Witnesses

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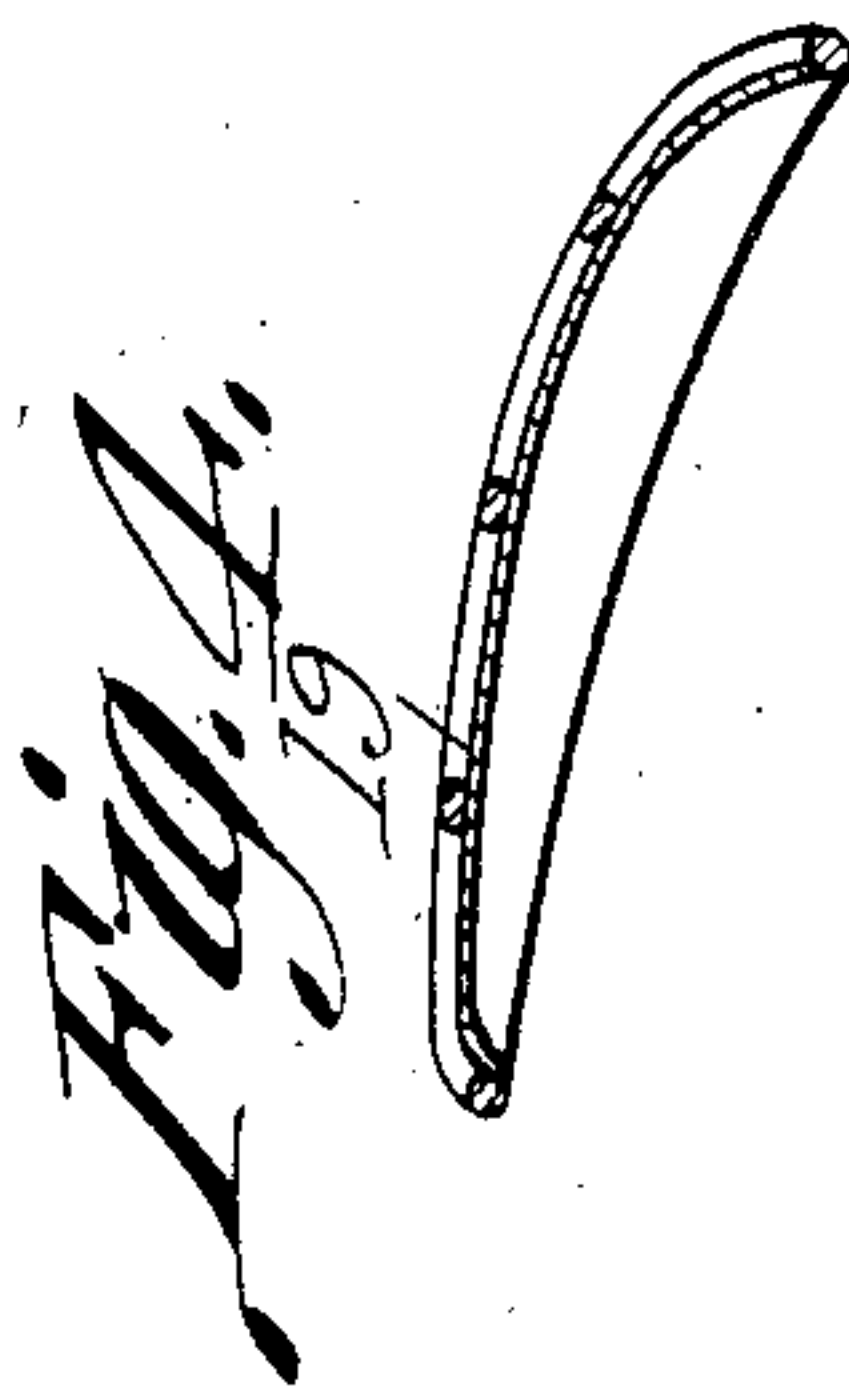
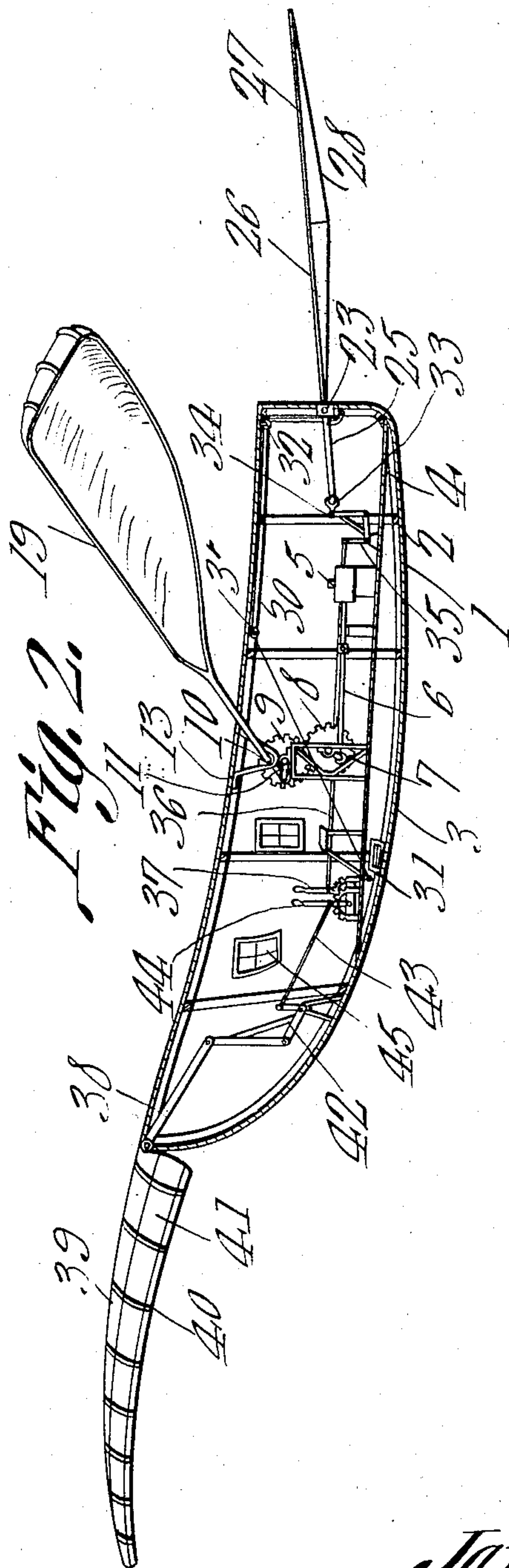
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3 SHEETS-SHEET 2.



Witnesses

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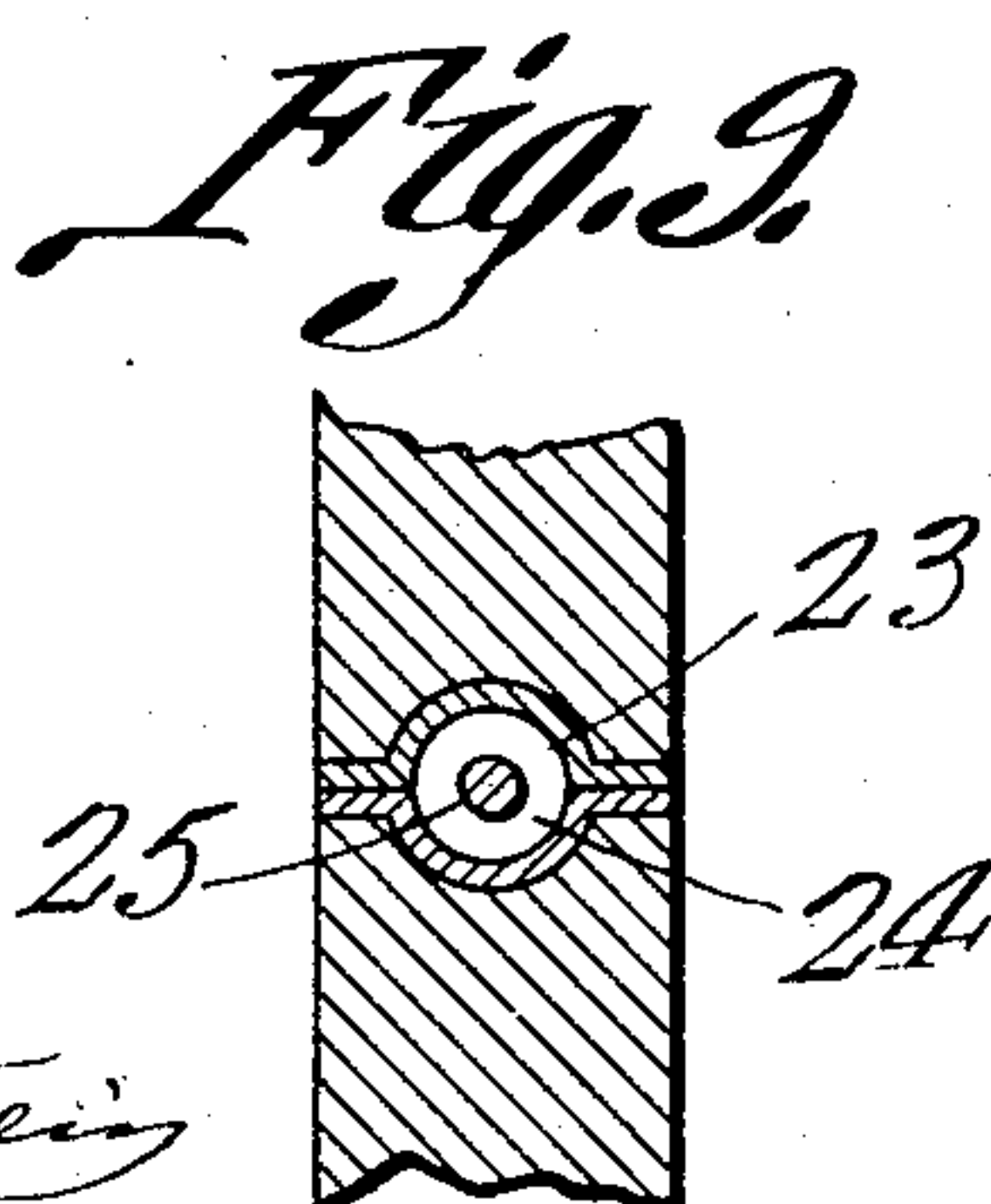
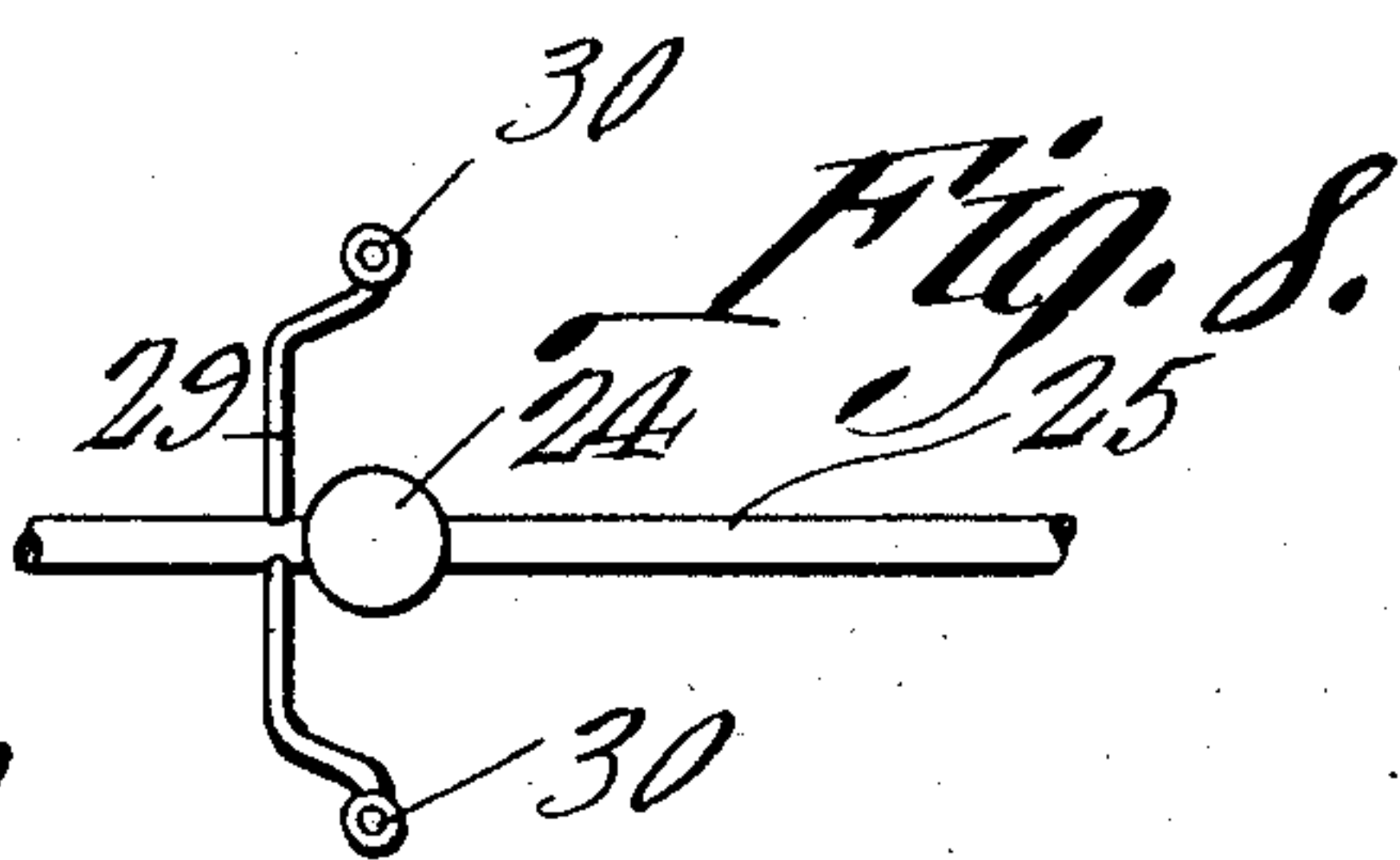
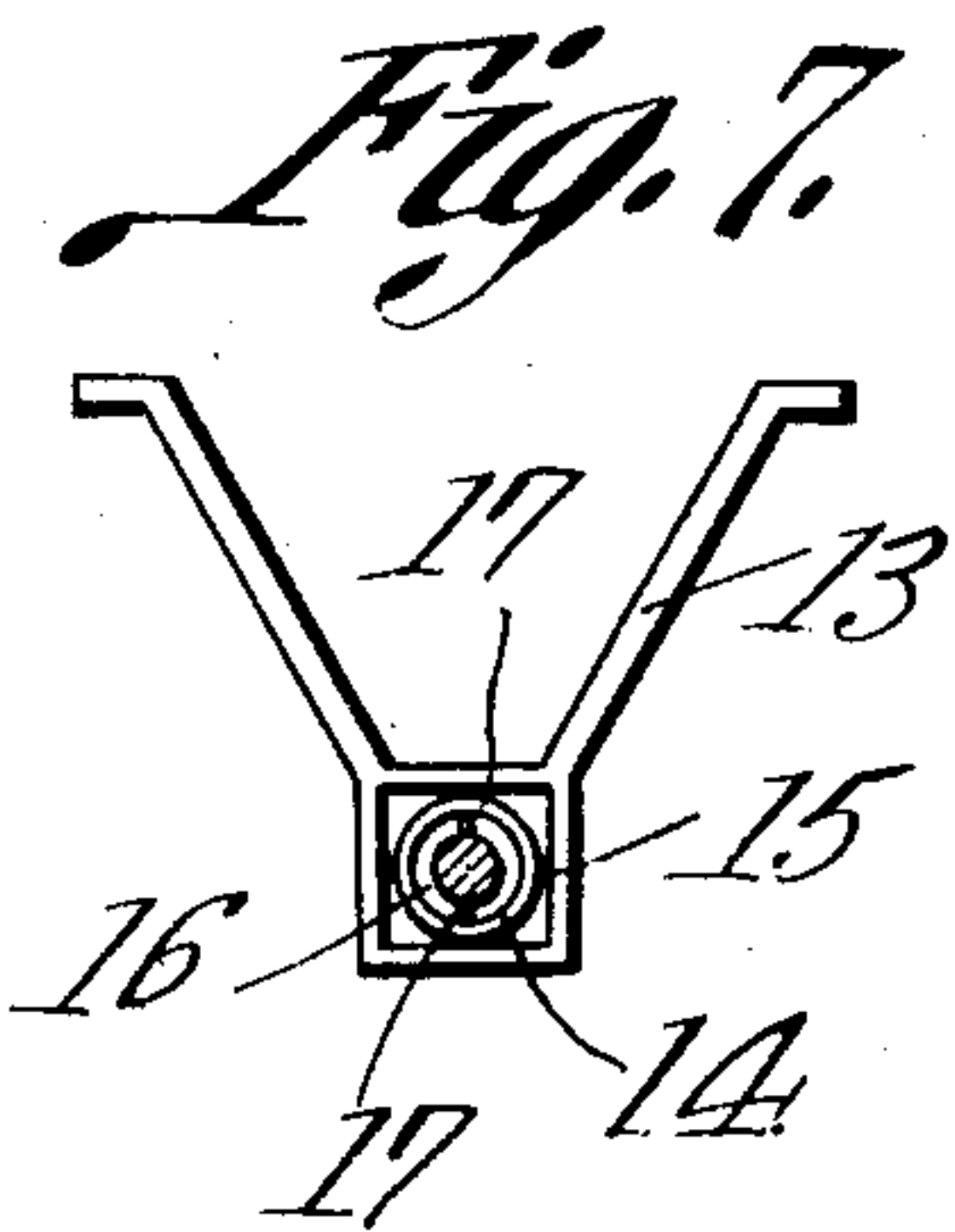
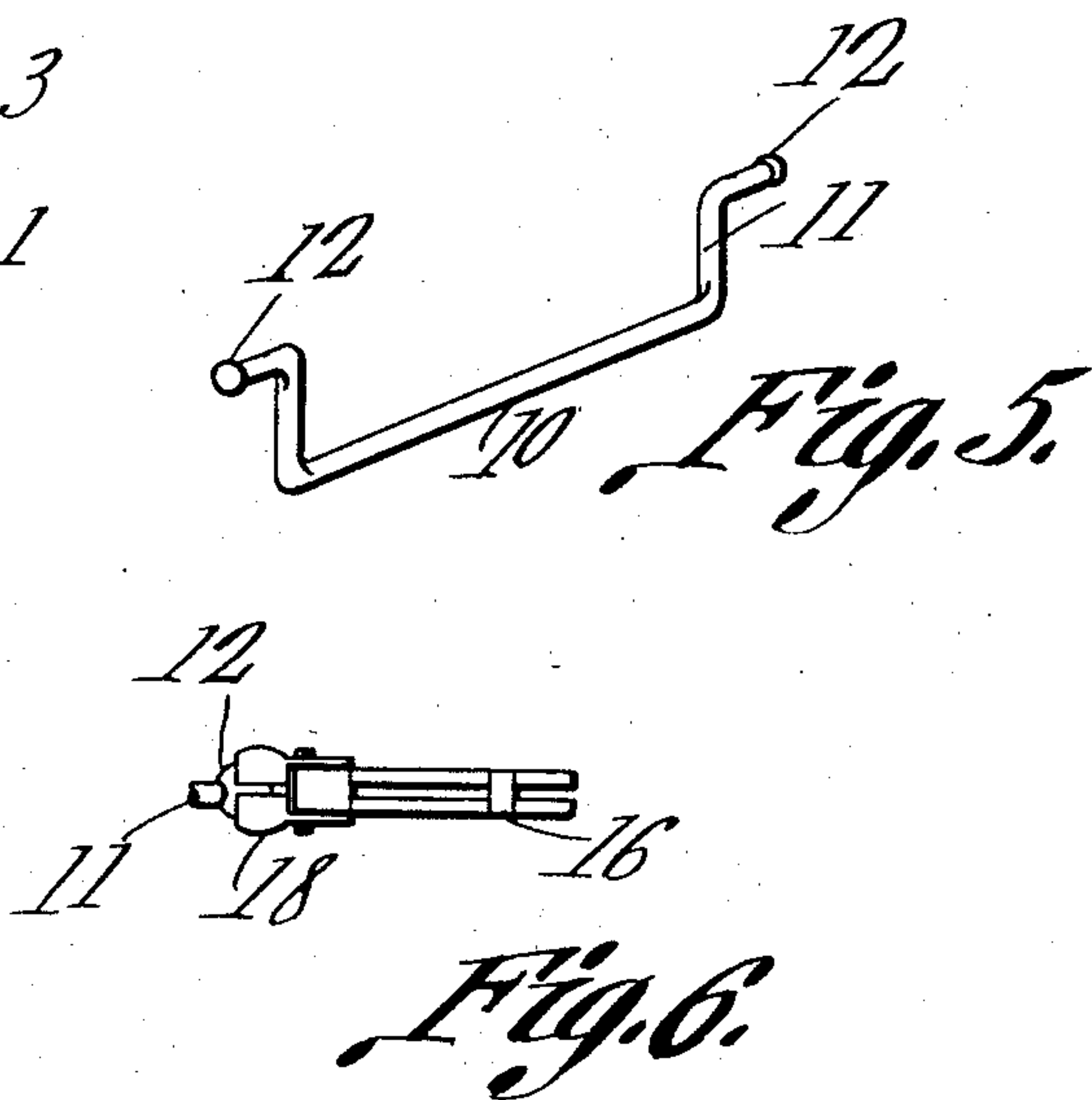
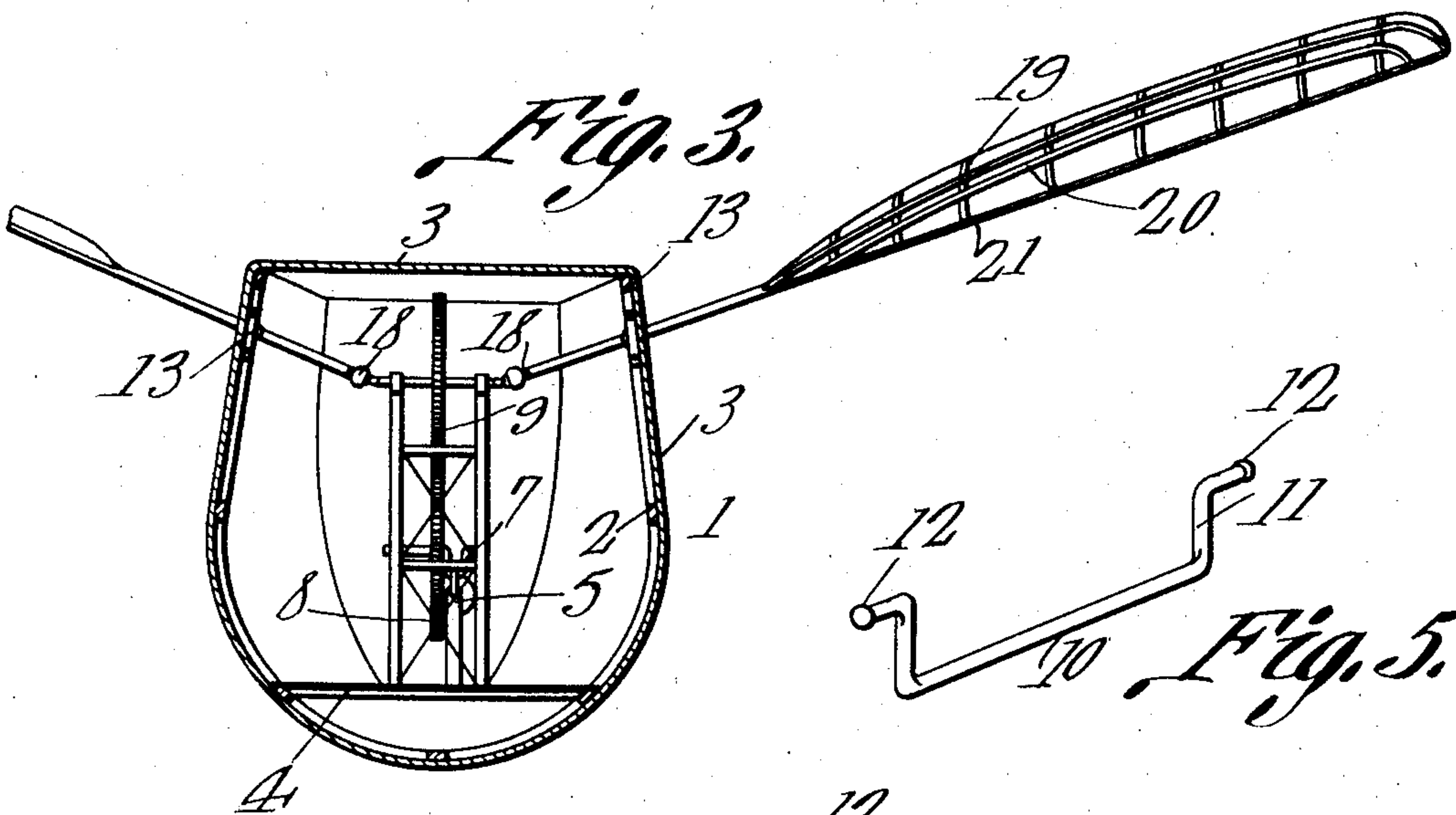
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

JAMES TRAVIS, OF CASCADE, MONTANA.

## AERODROME.

997,521.

Specification of Letters Patent.

Patented July 11, 1911.

Application filed March 7, 1911. Serial No. 612,752.

*To all whom it may concern:*

Be it known that I, JAMES TRAVIS, a citizen of the United States, residing at Cascade, in the county of Cascade and State of Montana, have invented a new and useful Aerodrome, of which the following is a specification.

This invention relates to aerodromes of the orthopter type.

One of the objects of the invention is to provide elevating and sustaining wings of novel form mounted for circular movement about an axis extending transversely of the machine, the mechanism employed for actuating the wings being simple, compact and durable and under the constant control of the aviator.

A further object is to provide a tail plane having means whereby it can be swung upwardly and downwardly and tilted to the right or to the left irrespective of said swinging movement so as to control the direction of flight.

A further object is to provide a novel form of controlling plane located in front of the body of the machine and by means of which the machine may be caused to soar upwardly or downwardly as desired.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings, the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a plan view of the complete machine. Fig. 2 is a side elevation thereof, the body being shown in section. Fig. 3 is an enlarged transverse section, one of the wings being broken away. Fig. 4 is an enlarged transverse section through one of the wings. Fig. 5 is a perspective view of the wing actuating crank shaft. Fig. 6 is a detail view of one of the universal connections between a wing and the crank shaft. Fig. 7 is a side elevation of one of the wing supporting hangers, the arm of the wing being shown in section. Fig. 8 is a plan view of a portion of the arm of the tail

plane. Fig. 9 is a section through the bearing of the tail plane.

Referring to the figures by characters of reference 1 designates the body of the machine, said body being made up of a suitable skeleton structure 2 having a covering 3 of light material, such as aluminum, a fabric, or the like. A floor 4 is constructed in the lower portion of the body and supports the motor 5 and the mechanism utilized for transmitting motion therefrom to the propelling wings. This motor is connected, by a pitman 6, to a crank shaft 7 having a gear 8 secured to it. This gear meshes with another gear 9 secured to a shaft 10 having cranks 11 at its ends, each crank terminating in a ball 12.

Hangers 13 are secured to the upper portion of the frame 2 at the sides thereof and each hanger has a ring 14 mounted in the lower portion thereof, said ring having trunnions 15 bearing within the hanger. An arm 16 extends through each ring 15 and is connected thereto by trunnions 17 journaled within the rings, these trunnions being extended at right angles to the trunnions 15 so that it thus becomes possible for the arm 16 to swing in any direction desired relative to the hanger without however, rotating within the hanger. The inner end of each arm 16 has a socket 18 made up of oppositely disposed concaved members bolted or otherwise fastened to the arm and this socket is adapted to receive one of the balls 12 hereinbefore referred to.

Each arm 16 is provided, at its outer end, with a substantially oval wing 19 made up of elongated bowed longitudinal ribs and transversely extending bowed ribs, these ribs being indicated at 20 and 21 respectively and being fixedly secured to the arm 16 in any manner desired. The frame formed by these ribs has a covering 22 secured to it, this covering being of any desired construction, preferably of flaps or the like designed to open during the upward movement of the wing to permit air to pass freely through the wing but to close automatically during the downward movement of the wing to prevent air from passing through the wing. This structure is well known in this art and it is not deemed necessary to enter into any detailed description thereof.

A socket member 23 is supported at the center of the back or stern of the body 1



and has a ball 24 movably mounted within it, this ball being formed upon the arm 25 of the tail plane 26. This tail plane is made up of ribs assembled to form a flat frame 5 provided with a covering 27 of fabric or other light material. This tail plane may be fan-shaped as shown in Fig. 1 and may be reinforced by truss wires 28 located there-  
 10 under as shown in Fig. 2. Arms 29 extend in opposite directions from the arm 25 close to the ball 24, the outer terminals of these arms 29 being in alinement with the center of the ball 24 and being connected, by cords 30 to the ends of a foot lever 31. These  
 15 cords are preferably arranged on guide sheaves 32 located beyond the ends of the arms 29 and whereby, when one of the cords is pulled longitudinally, it will exert an upward pull upon one of the arms 29 and thus  
 20 cause the arm 25 to rotate within the bearing 23.

The inner end of arm 25 is connected, by a ball and socket joint 33, to a link 34 pivotally connected to one arm of a lever 35, this  
 25 lever being in turn connected, by a rod 36 to a controlling lever 37. It will be apparent, therefore, that when lever 35 is shifted, upon its fulcrum, the inner end of the arm 25 can be moved upwardly or downwardly  
 30 so as to incline the tail plane relative to the line of flight and, while this plane is in any position to which it may be inclined, it can be tilted laterally by manipulating the foot lever 31 in the manner hereinbefore de-  
 35 scribed.

Hingedly connected to the front end of the body 1 is an arm 38 extending rearwardly from a controlling plane 39 made up of a skeleton frame 40 on which a fabric  
 40 or other light material 41 is secured. This controlling plane is bowed transversely and is also dipped in the direction of its length. The arm 38 is connected, at its inner end, to a lever 42 which, in turn, is connected  
 45 by a rod 43, to a controlling lever 44.

It will be apparent that when the motor 5 is set in motion, the crank shaft 10 will be rotated at a high speed and cause the outer ends of the wings 19 to describe circles  
 50 concentric with a line passing through the centers of the bearing rings 14. By reason of the peculiar construction of these wings, it will be apparent that they will be without effect during their upward and forward  
 55 movement but, during their downward and rearward movement they will displace the air and cause the machine to ascend in a forward direction. The controlling plane 39 can be tilted by means of lever 44 so as to

assume any desired angle relative to the 60 line of flight and this plane constitutes means for regulating the ascent and descent of the machine. By tilting the tail plane 26 about its transverse axis, the ascent of the machine can also be controlled and, by tilting 65 said tail plane about its longitudinal axis, it will operate to steer the machine while in flight.

It is to be understood that windows, such as indicated at 45 may be located wherever 70 desired within the body of the machine.

What is claimed is:—

1. An aerodrome including a body, hangers depending from the upper portions of the sides thereof, rings pivotally mounted 75 within the hangers, arms extending through and pivotally mounted within the rings, a socket at the inner end of each arm, an operating shaft, cranks at the ends thereof, balls upon the cranks and secured within 80 said sockets, and a wing at the outer end of each arm, each wing being substantially oval and having its lower face concaved transversely and longitudinally.

2. An aerodrome including an elongated 85 body, oscillatory elevating devices extending laterally from the body, a controlling plane extending forwardly from the body and having its lower face concaved longitudinally and transversely, said plane being piv- 90 otally connected at its rear end to the front end of the body, an arm fixedly connected to and extending into the body from said plane, and means under the control of the aviator for shifting the arm to tilt the plane. 95

3. An aerodrome including a body, laterally extending oscillatory elevating devices connected thereto, a tail plane, an arm extending into the car therefrom, a ball and socket connection between said arm and the 100 rear end of the body, laterally extending arms adjacent said connection and integral with the first mentioned arm, means connected to said laterally extending arms for rocking the tail plane about its longitudinal 105 axis, an operating lever, and a ball and socket connection between said lever and the arm of the tail plane, said lever being under the control of the aviator for tilting the tail plane about a transverse axis. 110

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES TRAVIS.

Witnesses:

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CHARLES A. BALLARD.