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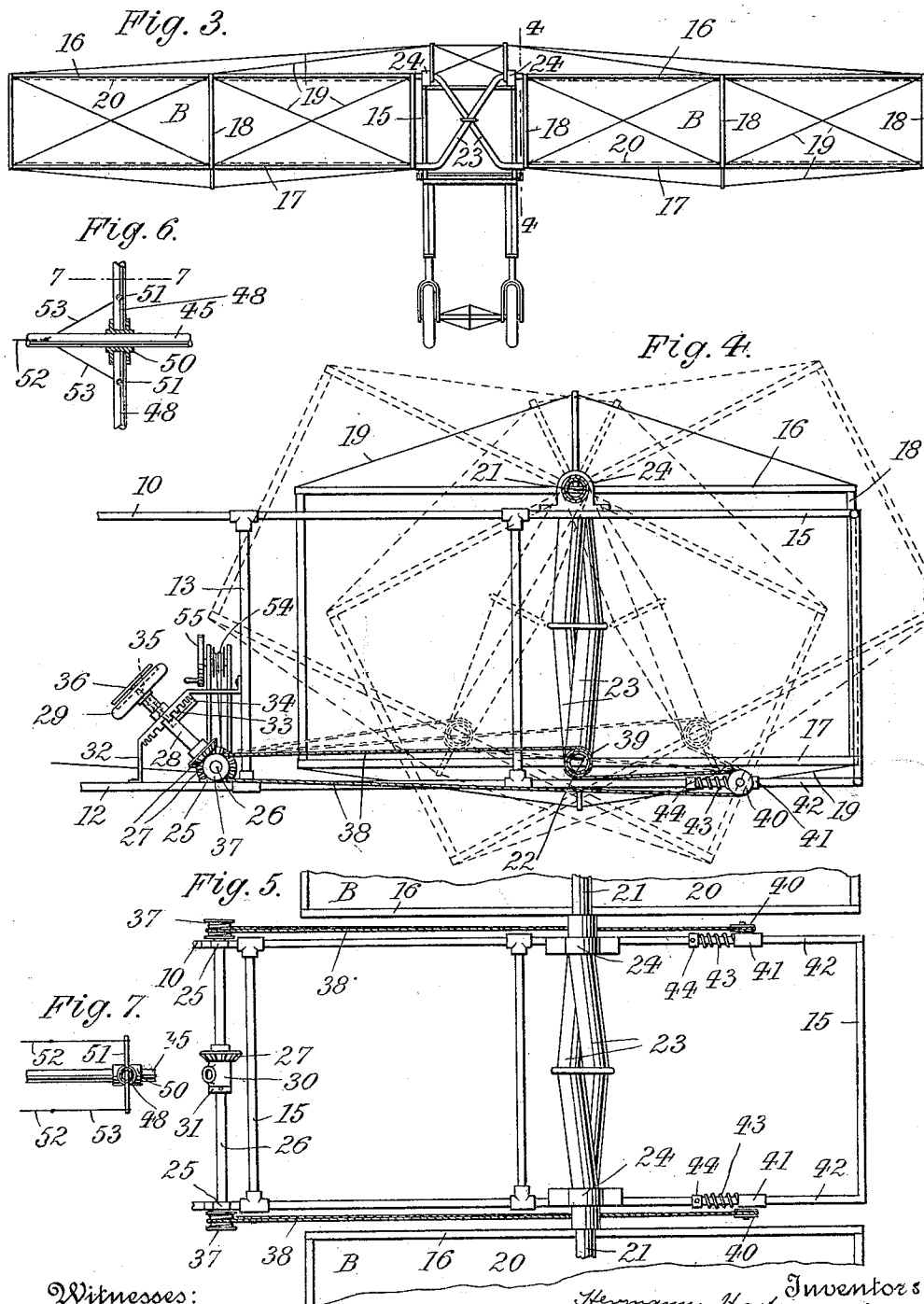
AEROPLANE.

APPLICATION FILED DEC. 4, 1909.

Patented Oct. 4, 1910.

2 SHEETS—SHEET 2.

971,535.



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AEROPLANE.

971,535.

Specification of Letters Patent.

Patented Oct. 4, 1910.

Application filed December 4, 1909. Serial No. 531,297.

To all whom it may concern:

Be it known that we, HERMANN HARTMANN and WILHELM KLEHE, both citizens of Germany, and both residents of New York city, 5 Manhattan, county and State of New York, have jointly invented new and useful Improvements in Aeroplanes, of which the following is a specification.

This invention relates to an improved 10 aeroplane and more particularly to novel and effective means for improving its soaring qualities and facilitating its ascent and descent.

The invention further comprises various 15 features of construction more fully pointed out in the claims.

In the accompanying drawings: Figure 1 is a plan of an aeroplane embodying our invention; Fig. 2 a side elevation thereof; 20 Fig. 3 a front elevation; Fig. 4 an enlarged longitudinal section on line 4—4, Fig. 3; Fig. 5 a plan of the biplane tilting means; Fig. 6 a sectional elevation of part of the rudder-post and adjoining parts, and Fig. 7 25 a horizontal section on line 7—7, Fig. 6.

The main body of the aeroplane comprises an upper frame 10 suitably braced as at 11, and a lower similar frame 12 connected to the upper frame by upright stays 30 13. The body thus formed has a straight front and inclined sides that converge from front to rear. It carries a correspondingly shaped single textile or other covering 14 which is preferably fastened underneath 35 frame 10. In this way, there is formed a strongly braced monoplane A, which is, substantially, of triangular shape. From the center of this monoplane extends forward a pointed oblong head or frame 15 flanked by a 40 pair of biplanes B, which are so connected to said head that they may be set at various angles to the monoplane. Each biplane is composed essentially of an upper oblong frame 16, a similar lower frame 17, connecting 45 stays 18, braces 19, and a pair of textile or similar coverings 20. Each upper frame 16 is furthermore provided with a central rod 21 arranged in parallelism with the front and rear edges thereof, while lower frame 50 17 is provided with a similar rod 22. It is preferred to connect the inner end of upper rod 21 in one biplane with the opposite inner end of lower rod 22 in the other bi-

plane by a diagonal brace 23, the two braces crossing each other within head 15. 55

In order to rotatably secure the biplanes B, to head 15, the latter is provided with a pair of bearings 24 within which the upper ends of braces 23 are journaled, so that such bearings constitute fulcrums for upper rods 60 21. The means for tilting the biplanes in unison, upon such fulcrums, are as follows:

Within bearings 25 of monoplane A, is journaled a transverse shaft 26 intergearing 65 by wheels 27 with the tubular spindle 28 of a hand wheel 29.

In order to properly support the spindle, its inner end engages a socketed sleeve 30 loose on shaft 26 and held against displacement by a collar 31. Near its outer end, spindle 28 passes through a perforated 70 bracket 32 connected to the frame-work of the monoplane. To lock spindle 28 and consequently shaft 26 in position, bracket 32 has a serrated annular flange or rack 33 adapted to be engaged by a detent 34 which 75 is carried by the inner end of a spring-controlled plunger 35 received within spindle 28. The outer end of this plunger carries a disk 36 adapted to be received within a 80 corresponding recess of wheel 29. As the hand wheel is grasped, the manual pressure of the operator will, without further effort, depress disk 36 to withdraw detent 34 from rack 33 and thus permit spindle 28 to be 85 freely rotated for the purpose of setting the biplanes in manner hereinafter described. When wheel 29 is released, spring plunger 35 will be automatically thrown outward to cause a re-locking of the spindle and con- 90 sequently of the biplanes.

Shaft 26 is provided at each end with a fast pulley 37, upon which is wound a rope or cable 38. The upper run of this cable is operatively connected to the lower side 95 of biplane B, by being fastened to the lower end of one of the diagonal braces 23. The lower run of the cable passes from pulley 37 first forwardly around an idler 40 of head 14, and then backwardly to be also operatively connected to the lower side of bi- 100 plane B, by brace 23. It will be seen that when wheel 29 is turned to the right, a pull will be exercised upon the lower runs of the cables which will cause the biplanes to 105 be so swung upon their fulcrums that their

forward edges will point upward. On the other hand, by turning wheel 29 to the left, a pull will be exercised upon the upper cable runs whereby the biplanes will be swung downward with their front edges. In this way the biplanes may be readily set for the ascent or descent of the air ship, as will be readily understood.

As the operative length of rope 38 varies with the different inclinations of the biplane, means should be provided to compensate for such required variation of rope-length. For this purpose idlers 40 are so secured to head 15, as to be movable toward or away from pulleys 37. As shown, idlers 40 are journaled to slides 41 movable along the lower bars 42 of head 15 and influenced by springs 43 which are coiled around such bars and bear against fixed collars 44.

The shaft 45 of propeller 46 passes longitudinally through monoplane A, and is driven by a suitable motor 47. The post 48 of a divided rudder 49 intersects shaft 45 at right angles and is bipartite in order to clear the same, the inner ends of the post-sections being stepped into a socketed bearing 50 of shaft 45. Through each post-section there extends laterally a pin 51, the right and left ends of the pins being respectively connected to the two runs of the steering cable 52 by branch cables 53. Cable 52 is wound upon the barrel 54 of the steering wheel 55, as usual. By turning this wheel, the pull exerted through cables 52, 53, upon pins 51, will cause post 48 to be turned to the right or left, so as to set the rudder.

We claim:

1. An aeroplane comprising a monoplane having a rigid, forwardly extending, pointed head frame, a pair of biplanes flanking said head frame, and means for tilting said biplanes.

2. An aeroplane comprising a monoplane having a straight front and rearwardly converging sides, a head frame formed rigid with the monoplane and extending centrally from the front of the latter, a pair of biplanes flanking said head frame in spaced relation to the monoplane, and means for tilting said biplanes.

3. An aeroplane comprising a monoplane, a forwardly extending head frame secured to the monoplane, the head frame having bearings, a pair of biplanes flanking the head frame, each biplane having upper and lower rods journaled in the bearings of the head frame, diagonal braces within the head frame that connect the inner ends of the diagonally opposed rods of the biplanes, and means for tilting the biplanes.

4. An aeroplane comprising a monoplane, a forwardly extending pointed head frame,

a pair of biplanes flanking the head frame and provided with upper and lower rods extending longitudinally and centrally of the biplanes, the biplanes being spaced from the monoplanes, the head frame having bearings and the inner ends of the upper and lower rods of the biplanes being journaled in said bearings, diagonal braces within the head frame, one brace connecting the upper rod of one biplane and the lower rod of the opposing biplane and the other brace connecting the other upper rod with the other lower rod, and means for tilting the biplanes.

5. An aeroplane comprising a frame, a shaft journaled in the frame, a head projecting from the frame, a pair of biplanes fulcrumed to the head, a pulley at each end of said shaft, a pair of idlers carried by the head, a pair of spring controlled pulleys carried by the head, a pair of cables connecting said pulleys, each cable passing over the corresponding idler, and means operable to rotate said shaft to tilt said biplanes.

6. An aeroplane comprising a frame, a shaft journaled in the frame, a head projecting from the frame, a pair of biplanes fulcrumed to the head, a pulley at each end of said shaft, a pair of idlers carried by the head, a pair of spring controlled pulleys carried by the head, a pair of cables connecting said pulleys, each cable passing over the corresponding idler, a socketed member rotatable on said shaft, a tubular spindle intergeared with the socketed member, a spring controlled plunger within the spindle, a detent carried by the plunger, a rack adapted to be engaged by the detent, and a disk having connection with said detent to release it from said rack, whereby, the biplanes may be locked and tilted.

7. An aeroplane provided with a propeller shaft, a bearing secured to the shaft and provided with oppositely disposed sockets, a rudder post in each socket, a pin projecting from each post, a steering cable carried by the aeroplane, branch cables connecting the main steering cable and the pins of said posts, and means for operating the steering cable.

8. An aeroplane comprising a frame, an idler carried thereby, a biplane fulcrumed to the frame, a pulley, a cable engaging the pulley and passing over the idler, means for connecting both ends of the cable to the biplane, a shaft carrying the pulley, a tubular spindle intergeared with the shaft, a spring-influenced plunger within the spindle, a detent carried by the plunger, and a rack adapted to be engaged by the detent.

9. An aeroplane comprising a monoplane, a head projecting from the monoplane, a pair of biplanes flanking the head, means for pivoting the biplanes to the head, a ro-

tatable shaft carried by the monoplane, operative connections between the shaft and the biplanes, a hand wheel having connection with the shaft the latter to tilt the biplanes,
5 a bracket on the monoplane provided with teeth, and a disk having connection with the hand wheel and provided with a detent for engagement with said teeth to effect a lock-

ing and unlocking of the hand wheel with relation to said shaft.

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