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C. B. McKENZIE.

AEROPLANE.

APPLICATION FILED NOV. 7, 1910.

1,009,770.

Patented Nov. 28, 1911.

3 SHEETS—SHEET 1.

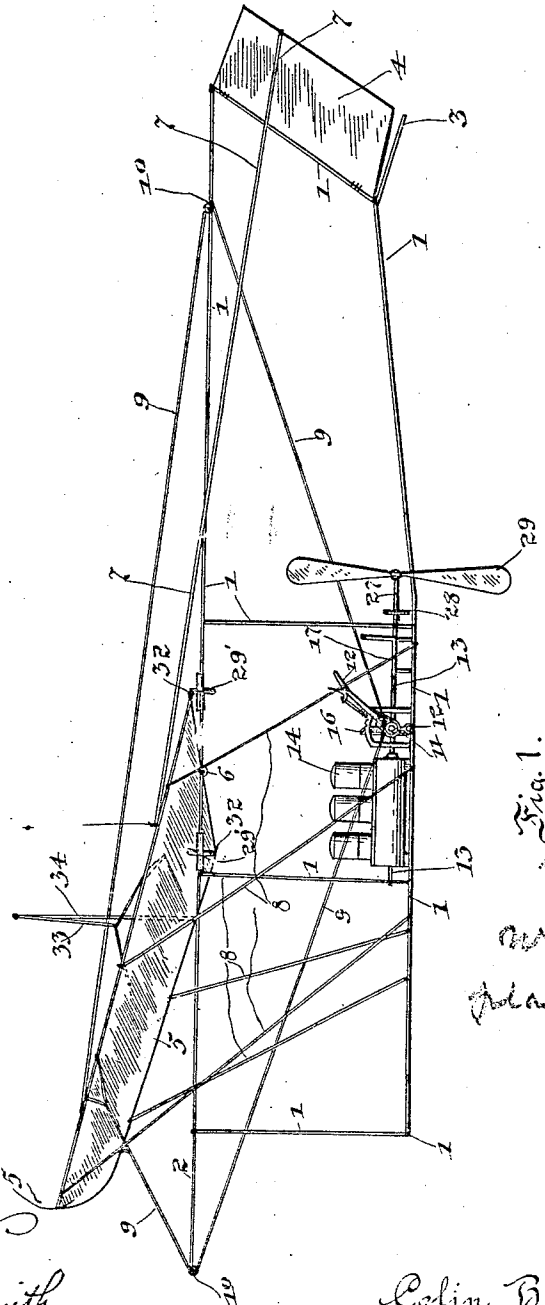


Fig. 1. Inventor's exhibit by means to annul ends exhibit drawn planes for and aft

Witnesses

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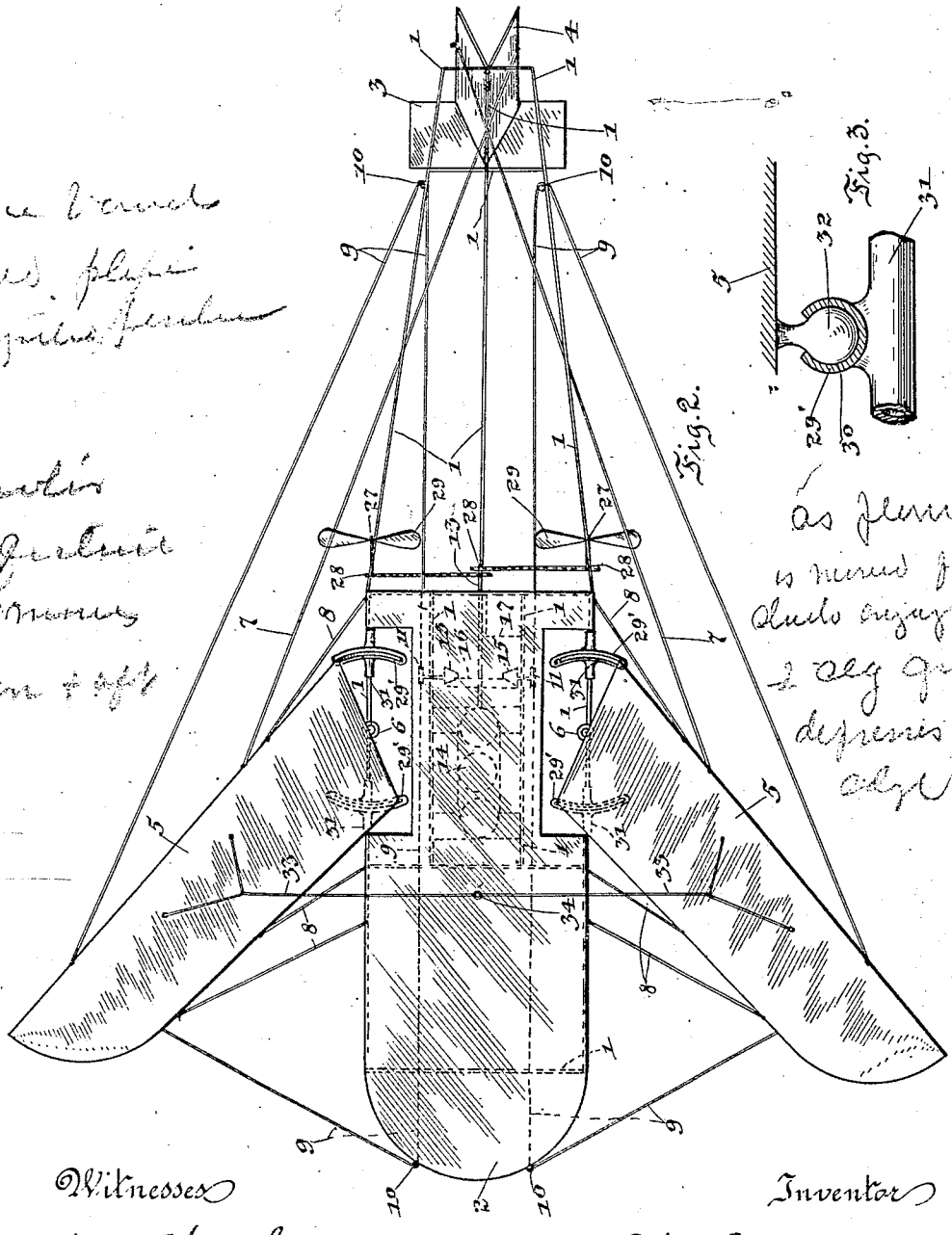


Fig. 2.

Fig. 3.

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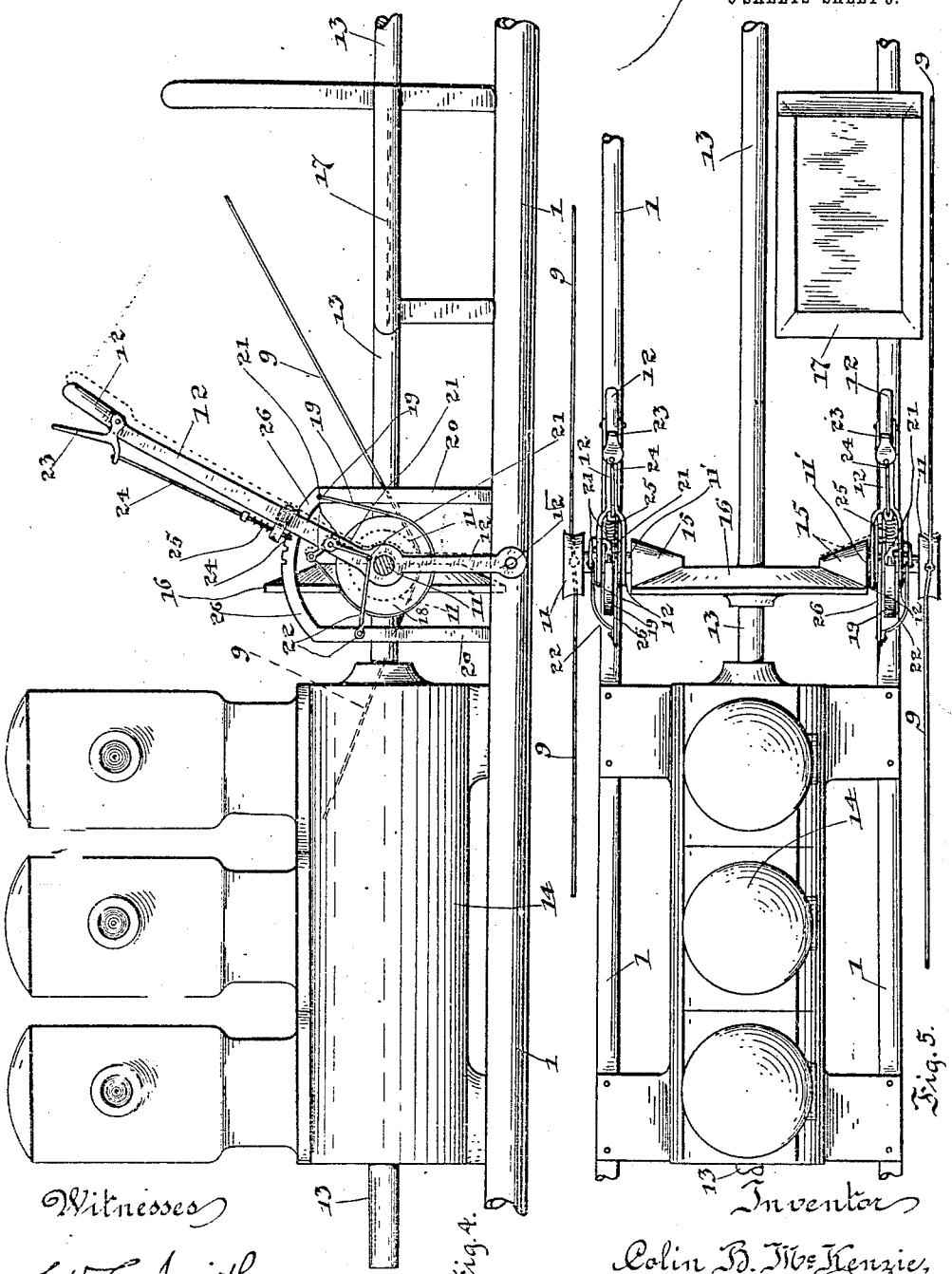


Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

COLIN B. McKENZIE, OF CHICAGO, ILLINOIS.

AEROPLANE.

1,009,770. Specification of Letters Patent. Patented Nov. 28, 1911.

Application filed November 7, 1910. Serial No. 591,059.

To all whom it may concern:

Be it known that I, COLIN B. McKENZIE, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Aeroplanes, of which the following is a specification.

My invention relates to improvements in aeroplanes and has for its object the provision of an improved machine of this character which shall be simple of construction and efficient in operation.

My invention consists in the novel construction and arrangements of parts all as will be hereinafter fully described and more particularly pointed out in the appended claims.

My invention will be best understood by reference to the accompanying drawings forming a part of this specification and in which,

Figure 1 is a side elevation of my improved aeroplane in its preferred form, Fig. 2 is a top plan view thereof, Fig. 3 is a detail elevation, Fig. 4 is a side elevation of the operating mechanism, and Fig. 5 is a top plan view of the latter.

The preferred construction for carrying my invention into effect as illustrated in the accompanying drawings comprises a main frame 1 having upper and lower longitudinal members, as shown in Fig. 1, and transverse connecting members, as shown in Fig. 2. Forward and rearward planes 2 and 3 respectively are arranged, as shown in Fig. 2. Mounted above the plane 3 and pivoted to a rear inclined member of the frame 1 is a rudder 4, the same being V-shaped, as clearly illustrated in Fig. 2. The main supporting planes 5 are pivoted to the upper longitudinal members of the frame 1 and extend laterally therefrom, ball-and-socket joints 6 being provided for this purpose. The planes 5 are adapted to swing forwardly and rearwardly on the pivots 6 and to simultaneously move the rudder 4 by means of wires 7 which are cross-connected, as illustrated in Fig. 2. The planes 5 are connected by means of a series of pivoted wires 8 with the lower longitudinal members of the frame 1, said wires being pivoted to the forward and rearward edges of said planes. From this arrangement it is apparent that when the planes 5 are moved forwardly that the more inclined rear wires 8 will cause the rearward edges of said planes to be depressed, which action increases the air resistance when the machine is traveling in a horizontal direction. The planes 5 are moved forwardly by flexible wires 9 which are connected to the planes, as shown in Figs. 1 and 2, and traverse pulleys 10 mounted on the frame 1. In use the wires 9 are reversely wound upon drums 11, but are shown only attached thereto for clearness of illustration. A wire 9 is mounted on each drum 11 in such a manner that it cannot slip thereon, so that when the drum is rotated a portion of the wire will wind upon the drum and another portion unwind therefrom. Each drum 11 is mounted upon a shaft 11′ journaled in the bifurcated portion of an operating lever 12, said portion of the latter spanning and being pivoted to a member of the frame 1, as clearly illustrated in Figs. 4 and 5. Separate drums 11 are provided for the controlling wires 9 of the planes 5 and the same are independently controlled by the levers 12. These drums rotate in the same direction since they receive their motion from the engine shaft 13 of the engine 14, hence the wires 9 are reversely wound thereon as aforesaid. The shafts 11′ on which the drums are mounted are provided with driven friction cones 15 adapted to contact with the driving friction cone 16 of the engine shaft 13 when the lever 12 is thrown to the full line position for moving the plane forwardly. After a plane 5 has been moved forwardly the desired distance the lever 12 controlling said plane is pulled to the dotted line position by the operator sitting on the seat 17.

In order to hold the plane in any position to which it is moved a brake drum 18 having a brake band 19 is provided, the latter being pivoted at one end to a segment supporting standard 20 and at the other to one arm of a bell-crank 21. This bell-crank passes through and is journaled in the operating lever 12, as shown in Fig. 4, a link 22 connecting the other arm of the bell-crank to a segment supporting standard 20. The arrangement and adjustment of the parts are such that the instant a drum 11 ceases to rotate, the same is locked in position by the brake mechanism above described. The lever 12 is held in either the full or dotted line positions by means of a locking device comprising a bell-crank 23 pivoted to the handle of the lever, a connecting rod 24, and a helical

tension spring 25 causing said rod to normally engage the notches of the segment 26.

The engine shaft 13 extends rearward from the gear 16 and is connected to the propeller shafts 27 by means of chains 28, the propellers 29 on said shaft being thus revolved in the same direction.

From the foregoing construction it is clear how the main planes 5 are moved forwardly and tilted by the actuations of the levers 12. The return or rearward movement of the planes 5 is caused by air resistance thereon. The planes 5, as before stated, are pivoted to the main frame 1 at the points 6, but these pivots are not sufficient to properly guide the movements of the planes. Segmental guides 29′ are therefore provided. Each guide 29′ is provided with a groove 30 circular in cross section, and with an integral sleeve 31 rotatably mounted on an upper longitudinal member of the main frame 1. Secured to the inner corners of the main planes 5 are spherical studs 32, as illustrated in Fig. 3, each stud being free to traverse the groove 30 in which it is mounted. The planes 5 are supported by wires 33 connecting the same with a vertical mast 34 extending upwardly from the plane 2.

The operation for manipulating the planes 5 is as follows: When a lever 12 is moved forward to cause the rotation of a drum 11, then a wire 9 will wind on the drum and cause one of the planes 5 to move forwardly. Simultaneously with this action the rear edge of the plane 5 would be depressed which produces a greater air resistance, this causing this side of the machine to be elevated. The rudder will also be moved by a wire 7 as hereinbefore described. The coöperation of the planes 5 and the rudder 4 is such that when a turn is being made that the proper side of the machine will be moved, thus maintaining stability.

An aeroplane of the construction as set forth is simple of construction and efficient in operation.

While I have shown what I deem to be the preferred form of my improved aeroplane, I do not wish to be limited thereto as there might be various changes made in the details of construction and the arrangements of parts described without departing from the spirit of the invention, hence I desire to avail myself of such variations and modifications as are comprehended within the scope of the appended claims.

Having described my invention what I deem as new and desire to secure by Letters Patent is:

1. In an aeroplane, a main-frame having upper and lower longitudinal members, oscillatory supporting planes pivoted to said upper members and extending laterally therefrom, an engine on said frame and propellers driven thereby, drums releasably connected with the engine shaft, operative connections between said drums and said planes for moving the latter forwardly, and means for oscillating said planes simultaneously with the forward movement thereof, substantially as described.

2. In an aeroplane, a main-frame having upper and lower longitudinal members, oscillatory supporting planes pivoted to said upper member and extending laterally therefrom, an engine on said frame and propellers driven thereby, rotatable drums releasably connected with the engine shaft, operative connections between said drums and said planes for moving the same forwardly, and means for oscillating said planes simultaneously with the forward movement thereof comprising a series of pivoted members connecting the forward and rearward edges of said planes with said lower longitudinal members, substantially as described.

3. An aeroplane comprising a main-frame having upper and lower longitudinal members and connecting transverse members, an engine carried by a part of said members, a pair of propellers having chain connections with the engine shaft, a pair of oscillatory main-supporting planes pivoted to said upper members and extending laterally therefrom, a pair of drums releasably connected with the engine shaft and controlling means therefor, flexible wires adapted to wind on said drums and connected to said planes for moving the same forwardly, and means for oscillating said planes simultaneously with the forward movement thereof, substantially as described.

4. An aeroplane comprising a main-frame having upper and lower longitudinal members and connecting transverse members and an engine carried by a part of said members, a pair of propellers having chain connections with the engine shaft, a pair of oscillatory main supporting planes pivoted to said upper members and extending laterally therefrom, a pair of rotatable drums releasably connected with the engine shaft and controlling means therefor, flexible wires adapted to wind on said drums and connected to said planes for moving the same forward, and means for oscillating said planes simultaneously with the forward movement thereof comprising a series of inclined pivoted members extending from the forward and rearward edges of the planes to said lower frame members, substantially as described.

5. An aeroplane comprising a main-frame having upper and lower longitudinal members and transverse connecting members, an engine carried by a part of said members, a pair of propellers having chain connections with the engine shaft, a pair of oscillatory main planes pivoted to said upper longitudinal members and extending laterally there-

from, a pair of rotatable drums releasably connected with the engine shaft and controlling means therefor, flexible wires adapted to wind on said drums and connect to said planes for moving the same forwardly, and means for oscillating said planes simultaneously with the forward movement thereof so that the rearward edges thereof will be lower than the forward edges, substantially as described.

6. An aeroplane comprising a main-frame, an engine mounted in said frame, and propellers driven thereby, drums releasably connected with the engine shaft, flexible wires adapted to wind on said drums, oscillatory main planes pivoted to said frame and means for supporting the same, said wires being connected to said planes for moving the same forwardly, and segmental guides rotatably mounted on said frame and connected to the inner corners of said plane, substantially as described.

7. In an aeroplane, the combination with a main-frame, of an engine supported on said frame, a pair of propellers connected with the engine shaft, a pair of oscillatory main planes pivoted to said frame, a pair of rotatable drums, friction cone-gears connecting said drums with said engine shaft; an independent lever for controlling the cone-gear driving connection and releasement of each drum, flexible wires connecting said drums with said planes, and a brake mechanism for holding said planes in position when the actuating gears are released, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

COLIN B. McKENZIE.

Witnesses:
HELEN F. LILLIS,
JOSHUA R. H. POTTS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."