R. E. McBRIDE.

MONOPLANE.

APPLICATION FILED FEB. 1, 1912.

1,041,131.

Patented Oct. 15, 1912.

4 SHEETS—SHEET 1.

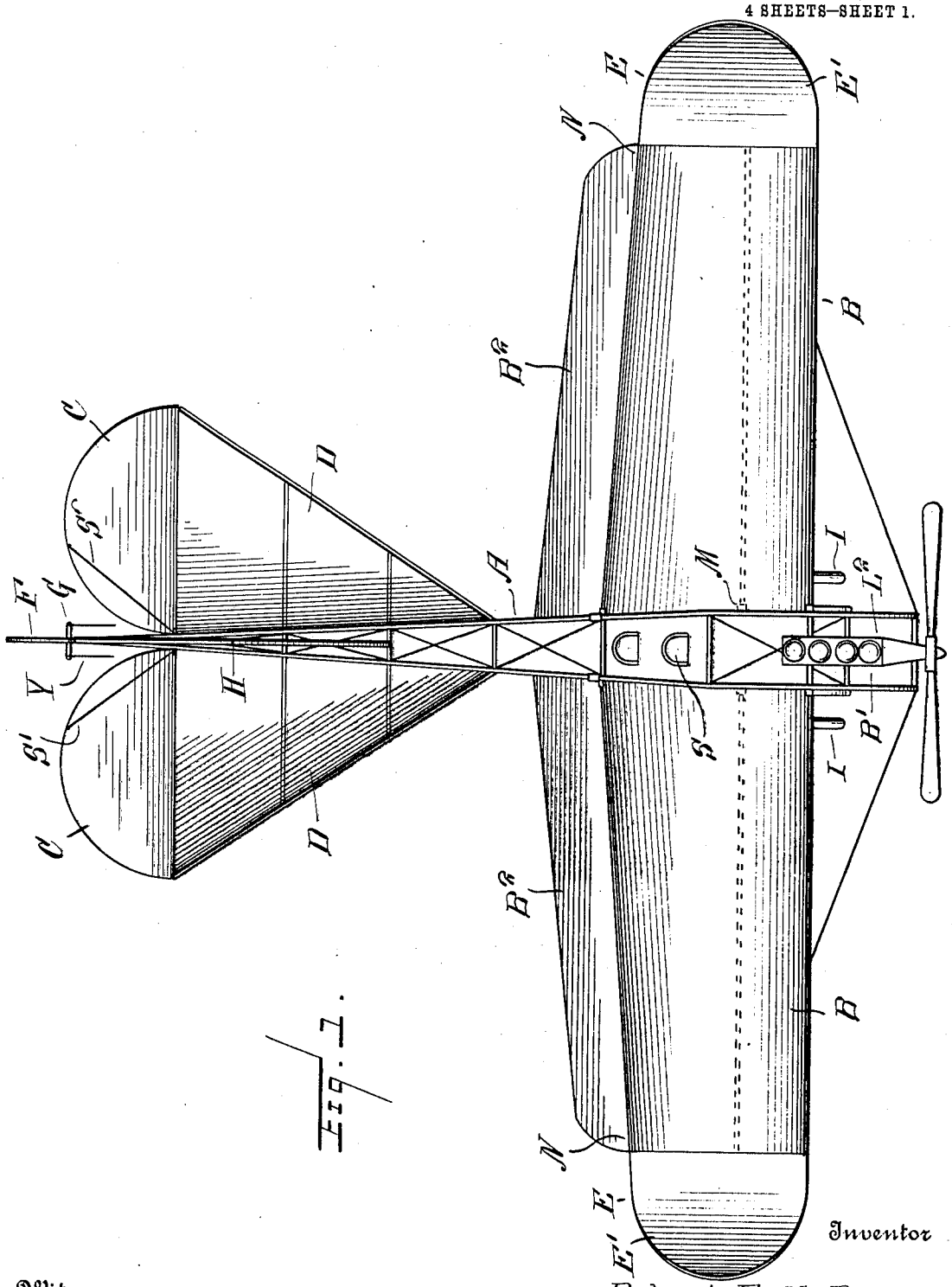

Fig. 1.

Witnesses

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4 SHEETS—SHEET 2.

Fig. 2.

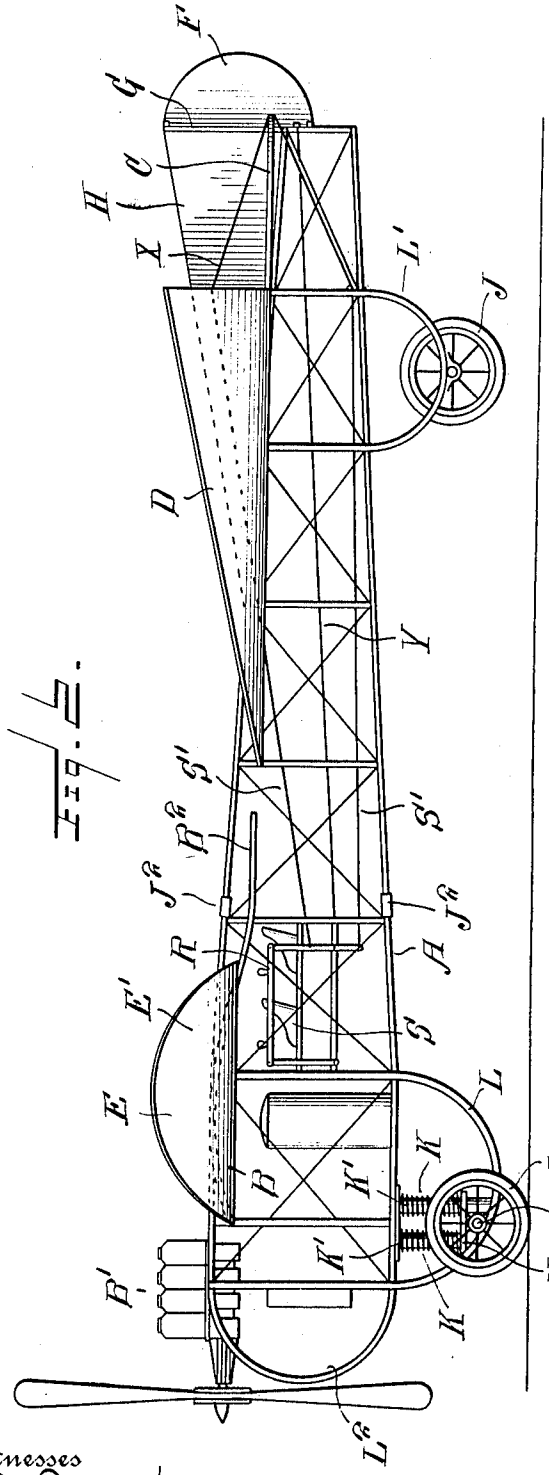

Fig. 4.

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4 SHEETS—SHEET 3.

Fig. 4.

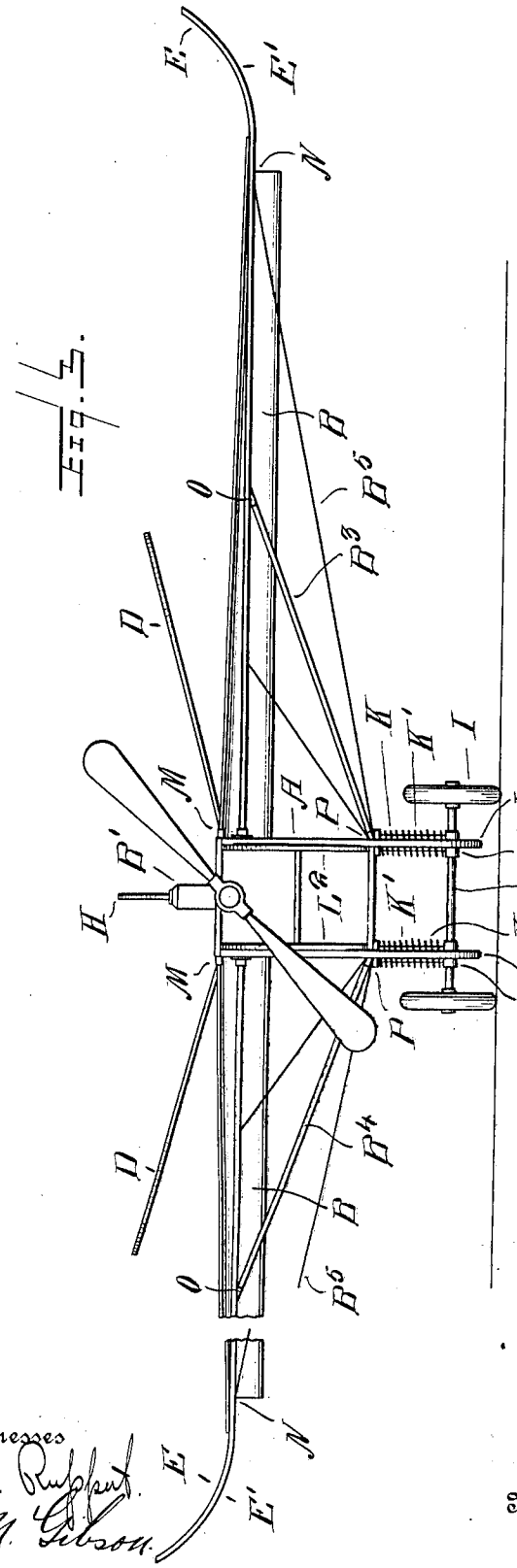
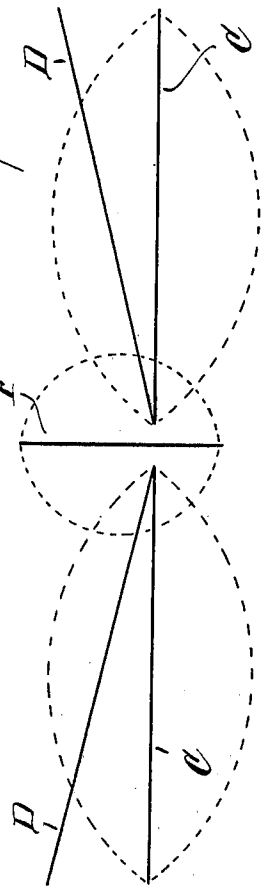


Fig. 5.



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4 SHEETS—SHEET 4.

Fig. 6.

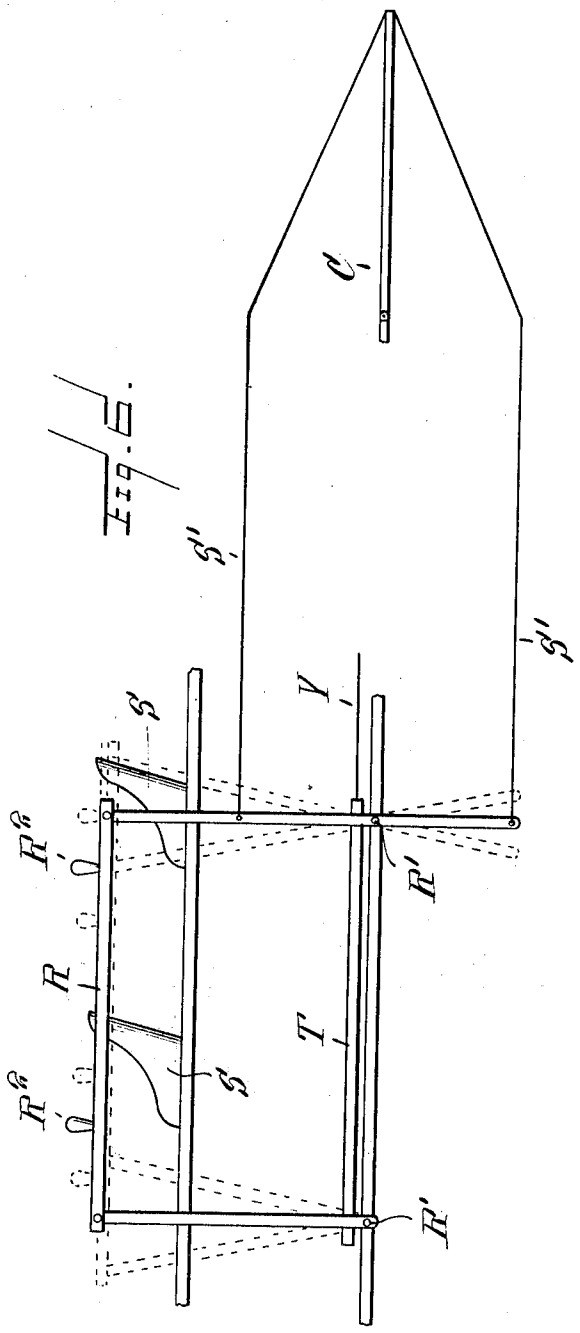
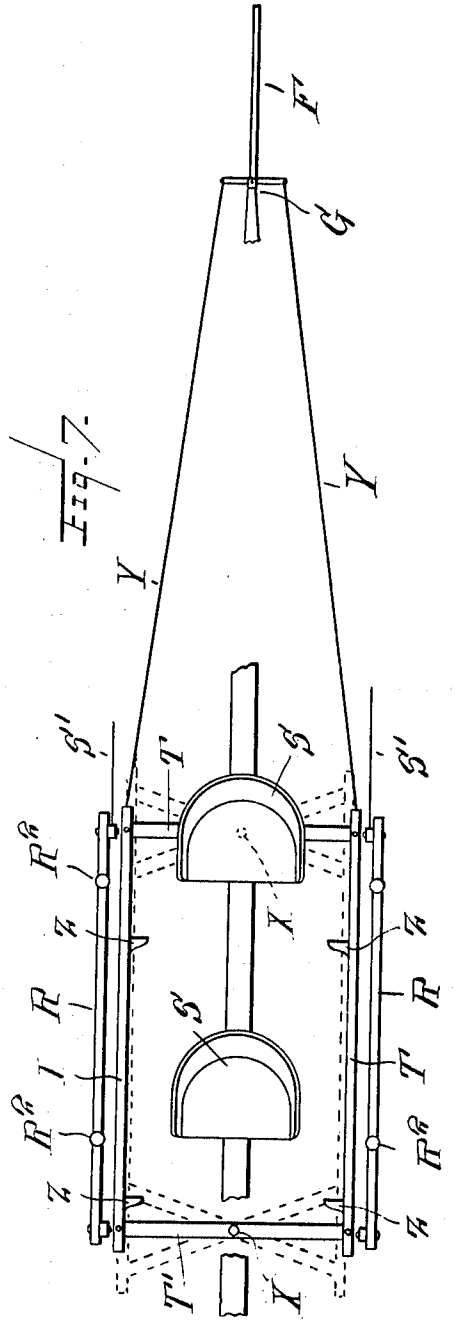


Fig. 7.



Witnesses

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MONOPLANE.

1,041,131. Specification of Letters Patent. Patented Oct. 15, 1912.

Application filed February 1, 1912. Serial No. 674,740.

To all whom it may concern:

Be it known that I, ROBERT E. McBRIDE, a citizen of the United States, residing at Mullen, in the county of Hooker and State of Nebraska, have invented new and useful Improvements in Monoplanes, of which the following is a specification.

This invention relates to flying machines of the monoplane type, and its object is to provide a machine of this character which possesses increased efficiency in ease of control, ease of assembling or demounting, increased stability and facility with which the control apparatus can be shifted from one pilot to the second pilot or to both together.

With these and other objects which shall appear from the description given, I shall proceed to explain my invention in which similar references refer to similar parts and in which:

Figure 1 is a top plan view. Fig. 2 is a side elevation. Fig. 3 is a front elevation. Fig. 4 is a diametrical curve of a section of the supporting surface. Fig. 5 is a diametrical illustration of the operation of the rear elevating and steering rudders. Fig. 6 is the controlling mechanism of the rear elevating rudders. Fig. 7 is the controlling mechanism for the rear steering rudder.

In the drawings, A represents the body frame of the flying machine composed of the usual struts, ribs and bracings, B the lifting surfaces, C the rear elevating rudders, D the stabilizing fins, E the wing tips, F the rear steering rudder, G the support to which the rear rudder F is hinged, H the centrally disposed vertical stabilizing fin, I the front wheels, J the rear wheel, K the springs which resiliently support the front wheels, L the front skids, L′ the rear skid, M the coupling where the supporting surfaces are coupled to the body A of the machine, N indicates the point where the curved portion of the supporting surfaces end, O and P indicate the couplings for the wing supports, Q the axle to the front wheel supporting the yokes U and U′ which in turn support the resilient springs K.

R indicates the pivoted frame work, within easy reach to each side of the pilot seats S, which controls through the operating cables S′ the stabilizing rudders C. Between the said controlling means R and the pilot seats S are the controls for the rear steering rudder F, indicated at T, with foot rests Z projecting from said controlling means T, said controlling means operating the rear steering rudder by means of cables Y. The pilot seats S are placed one in the rear of the other as indicated on the drawings.

The body frame work of this car is of the type common in monoplanes holding in its forward portion, the supporting planes B, the engine and propelling mechanism B′, forward sfruts L, resilient wheel mounted mechanism K, U and U′ and wheels I, also front bracing struts L^2. These front bracing struts L and L^2 are of an approximately U-shaped construction.

The resilient means of mounting the wheels are composed of two vertical supports K′ surmounted by a coil spring K^2 resting upon the yokes U and U′, which in turn support the front axles Q of the machine.

The supporting surfaces B are of the usual parabolic curve common to this structure of machines but having a straightening camber from the body frame A to the wing-tip. It has a straight extension portion B^2, and also a wing tip E which is straight in cross-sectional outline from the front and rear but with an upwardly sloping curve from the inner edge to the outer edge, as indicated on the drawings in Figs. 1 and 3 at E′. These keep said machine in an approximately stabilized position when in flight through the up-turned portions of the said wing-tips catching the air above their surfaces and throwing the machine back into proper position the same as do the wings of the common soaring birds such, for instance, as the buzzard, while the rear portion B^2 acts in the same operative manner on their undersurfaces. The supporting surfaces are attached to the body frame work by means of couplings M at approximately the point indicated on the drawings. These supporting surfaces are also braced into operative position by means of wing supports B^3 and B^4 which are coupled by means of coupling joints O and P at the points approximately indicated on the drawing as seen in Fig. 3. Furthermore said supporting surfaces are braced in the usual manner by wire or other suitable braces B^5. In the rear of said body frame work are mounted stabilizing fins D which are placed in an approximately horizontal position at a dihedral angle to each other, one to each side of the frame. These stabilizing

fins are rigid and are of an approximately straight line in cross-sections. Attached to the rear portion of the frame work in a rigid vertical position is a fin H, at the rear end of which is mounted the steering rudder support G from which the steering rudder F is manipulated to the right or left as desired. At approximately underneath the rear edge of said stabilizing fins D are placed two horizontal elevating rudders C one to each side of the frame which are operated both up, or both down, or one up and one down as desired.

The rear portion of the body frame work also supports the approximately U-shaped strut L′ which rigidly supports a mounted wheel J.

At approximately the forward portion of the frame are mounted two or more pilot seats one in the rear of the other, and on each side of these pilot seats are mounted the vertical and horizontal rudder controls R and T. The controls R for the horizontal rudders C are mounted in a vertical position and pivotally operated, the pivoted points being indicated by R′ and having operating handles R^2 by which said mechanism can be operated in a forward and rearward manner, either separately or together, at the will of the pilot. Attached to this vertical mechanism and running to the horizontal rudders C are the control cables S′. Between the mounting of this vertical control mechanism and the pilot seats are mounted horizontal bars T′ having braces T with the projections or foot rests Z as shown in Fig. 7 of the drawing. This horizontal mounted mechanism is also pivotally connected at the points marked X on said illustration. By means of said foot rests Z, said mechanism can be operated in forward and rearward position thereby controlling the steering rudder F through the medium of operating cables Y. By this compact yet simple arrangement the horizontal rudders C and the steering rudders F can be operated by one or both pilots at will, and can be operated in unison, or each one separate. If the rudders C are operated in an upward or downward manner and the steering rudder operated to the right or left the control of the machine is made perfect as diagrammatically indicated by Fig. 5 of the drawings.

Beside the coupling means for mounting or dismounting the supporting means as heretofore indicated, additional coupling means are indicated in Fig. 2 of the drawings by reference characters J^2 whereby said frame work can also be readily dismounted for purposes of shipping or storing.

In operation the pilots take their seat, the propelling mechanism is started and the machine freed for flight, the pilots place their feet upon the foot rests Z and taking hold of the controlling mechanism R, readily manipulate the elevating and steering rudders C and F. If the machine should tilt up on the right side, by the operation of the right control R forward and the left control rearward and the right foot rests Z forward the rudders are easily manipulated so that the left rudder C is lowered and the right rudder C is raised and the steering rudder F is shoved to the left thereby throwing said machine into proper horizontal position. It is not necessary, however, to manipulate the steering rudder F except in strong winds, as the two horizontal rudders C will, alone, control the lateral balance of the machine in light winds. The pilot has his option whether he will use one or both arrangements at the same time. When only the rudders C are used the monoplane will not be veered out of its line of flight, thus escaping the tendency to veer which is had when the vertical rudder F is used.

I am not limited to the exact construction as illustrated nor to the exact mountings as shown but can and do modify said mechanism to within the scope indicated.

Having now described the structure and operation of my device and having indicated the improvements over the art, what I claim as new, is:—

1. In a flying machine of the heavier-than-air type, the combination with a central longitudinal body frame work, of forward and rearward approximately U-shaped supporting struts, resiliently mounted forward wheels, forwardly mounted supporting surfaces, rearwardly mounted approximately horizontal, stabilizing fins mounted at a dihedral angle to each other, a vertical stabilizing fin between said dihedral fins, a right and left mounted elevating rudder, a vertically mounted steering rudder and propelling mechanism.

2. In a flying machine of the heavier-than-air type, the combination of a central longitudinal body, a supporting surface mounted to the forward left side of said body, a like supporting surface mounted to the right forward side of said body in the same plane as said left mounted surface, said surfaces having a parabolic curve with a rigid straight rear edge portion and an upwardly sloping end-tip, vertically and horizontally mounted rear stabilizing fins and elevating and steering rudders.

3. In a flying machine of the heavier-than-air type, having supporting surfaces, stabilizing fins, two elevating rudders and a single steering rudder, the combination therewith of a pivotally mounted controlling device within handy reach and to the right of a pilot seat, said controlling device consisting of a horizontal handle-operated bar, pivotally mounted uprights connected to said bar, and controlling cables running from the rear portion of said device to one of said elevat-

ing rudders, a like and second controlling device consisting of a horizontal bar and two pivotally mounted uprights to the left of said pilot seat having handles and controlling cables running to the second of said elevating rudders, substantially as described.

4. In a flying machine of the heavier-than-air type, the combination of a body portion, supporting surfaces, stabilizing fins, elevating rudders, steering rudders, propelling mechanism, controlling mechanism for said elevating rudders and a controlling device for said steering rudder, the said last mentioned controlling device consisting of a pivotally and horizontally mounted frame work, of separate cables running from said frame work to said steering rudder, and said frame work consisting of two longitudinal bars with foot rests and two pivotally connecting bars centrally mounted near the pilot seats, substantially as described.

5. In a flying machine of the heavier-than-air type, the combination of a central longitudinal frame work, rear stabilizing fins mounted on said framework, elevating and steering rudders mounted at the rear end of said framework, a rear wheel and wheel supporting strut mounted at the rear base of said framework, propelling and power mechanism mounted in the forward end of said framework, a forward strut, forward wheel supporting struts, resiliently mounted wheels on said wheel supporting struts and supporting surfaces mounted to each side at the front end of said framework, said surfaces having a parabolic curve from front to rear, the camber of which decreasing from the framework to the wing-tip, a rear straight extension to said surface and an upwardly turned wing-tip, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT E. McBRIDE.

Witnesses:
F. T. Morrison,
Wm. W. Gruenig.