

E. MAREK.
AÉROPLANE.

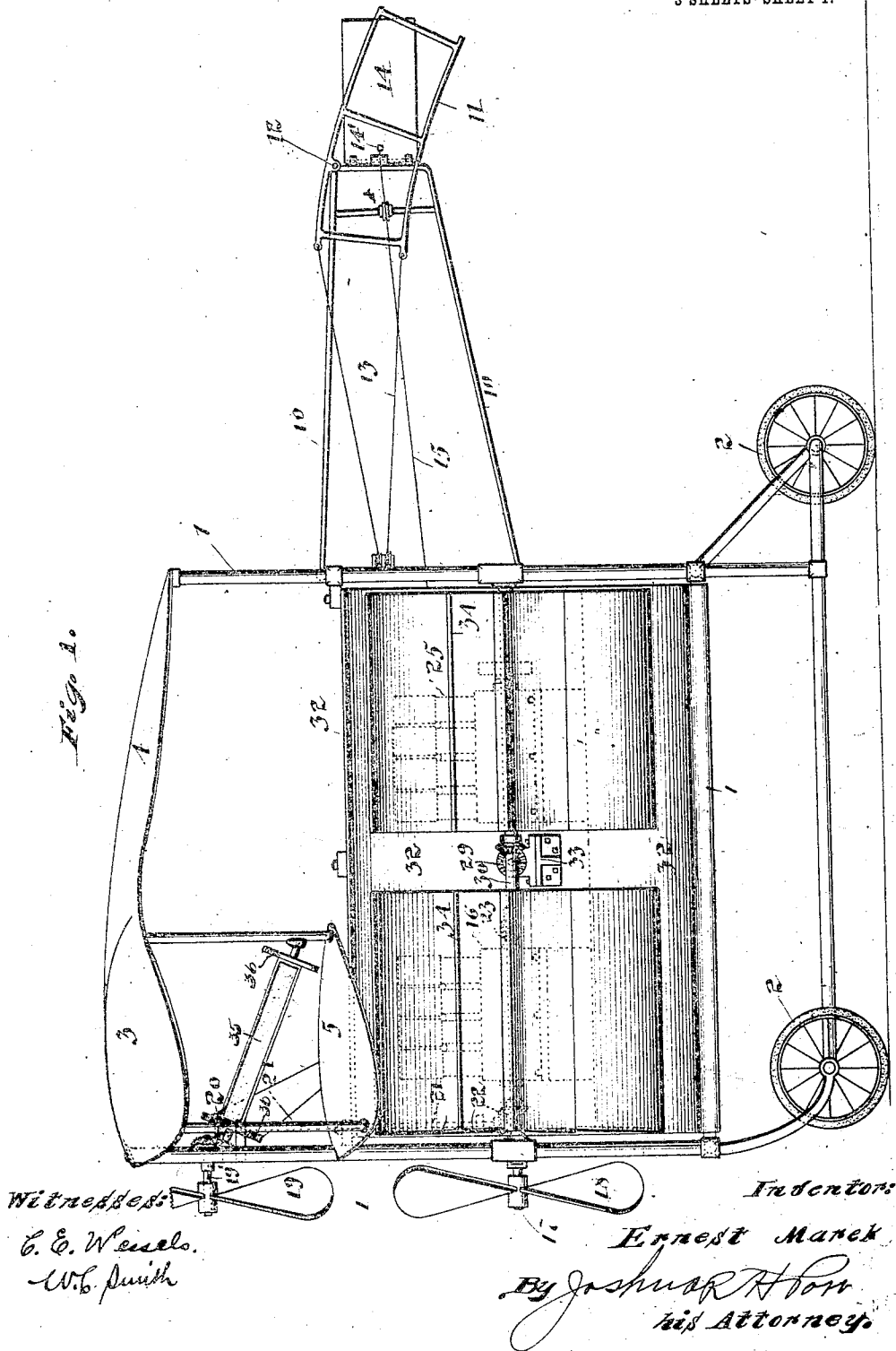
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Patented Dec. 31, 1912.

3 SHEETS—SHEET 1.

1,049,117.

Fig. 1.



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W. L. Smith

Inventor:
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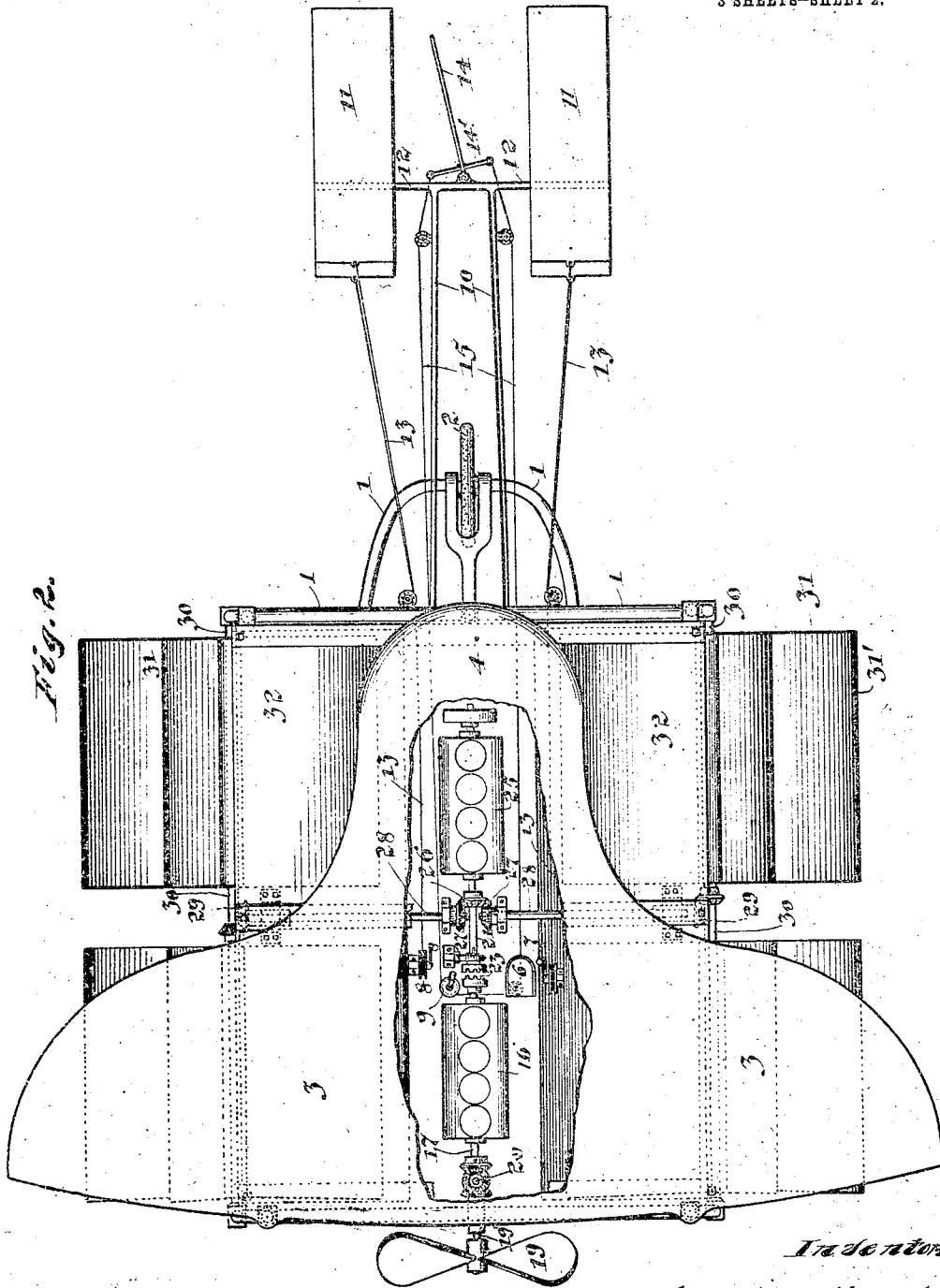
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

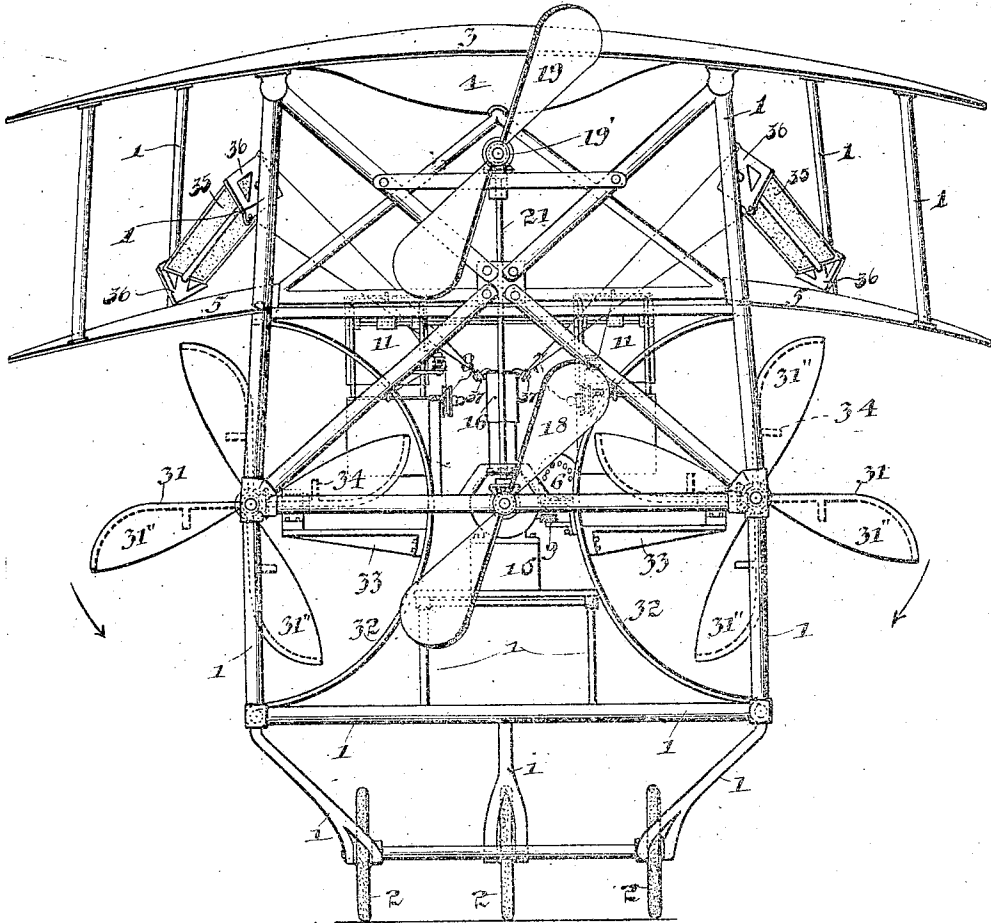
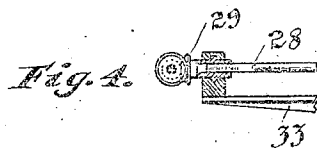


Fig. 3.



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UNITED STATES PATENT OFFICE.

ERNEST MAREK, OF CHICAGO, ILLINOIS.

AEROPLANE.

1,049,117

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed November 13, 1911. Serial No. 660,053.

To all whom it may concern:

Be it known that I, ERNEST MAREK, 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, the object being to provide a machine of this character which shall be simple of construction and efficient of operation.

The invention consists in the novel construction, combinations and arrangements of parts hereinafter described and claimed.

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

Figure 1 is a side elevation of an aeroplane embodying my invention, Fig. 2 is a top plan view thereof, a portion being broken away to expose the operative mechanism, Fig. 3 is a front elevation of the machine and Fig. 4 is a detail sectional view.

The preferred form of construction as illustrated in the accompanying drawings comprises a main frame 1, the parts of which are preferably tubular for lightness of construction. Supporting the frame 1 is a plurality of wheels 2 which are arranged as illustrated in Figs. 1 and 2. Extending transversely of the main frame 1 and rigidly secured thereto is an elongated main supporting plane 3 which is curved in cross-section and provided with a central rearward extension 4, as illustrated in Fig. 2, which serves to maintain the machine in a straight line during flight. Disposed directly under the plane 3 and curved transversely is an auxiliary plane 5 the general conformation of which will be apparent by reference to Fig. 3. A pilot seat 6 is centrally located in the main frame 1, and arranged within access thereto are steering plane controlling devices 7, 8 and 9 all of which consist in crank operated rotatable drums. Extending rearwardly from the main frame 1 is an extension 10 to the rear extremity of which is mounted for oscillation a pair of elevating planes 11, there being a horizontally disposed transverse shaft 12 on which said planes are adapted to oscillate as illustrated in Fig. 1. A plurality of controlling wires 13 are stretched from the forward extremities of the planes

11 to the drums 7 and 8, by rotation of which said planes are oscillated in the desired direction. Interposed between the planes 11 and adapted to swing on a vertical axis is a rudder 14 having a transverse bar 14' adjacent the pivot thereof to the ends of which operating wires 15 are attached and extended forwardly to the controlling drum 9. In this manner the elevating planes and rudder are easily operated by a pilot on the seat 6.

A motor 16 having a shaft 17 arranged centrally and extending longitudinally of the frame 1 is disposed as shown in Fig. 2, there being a helical propeller 18 mounted on the forward end of said motor shaft. Disposed directly above the propeller 18 is a second helical propeller 19 which is mounted to rotate in the same direction and to have a like forward thrust. The propeller shaft 19' is connected by bevel gears 22, to the motor shaft 17, whereby said second propeller is positively driven.

Arranged in alinement with the motor shaft 17 and adapted to be clutched thereto by means of a tooth clutch 23 is a second motor shaft 24 which projects forwardly from the motor 25 carrying the same. A driving bevel gear 26 is on the shaft 24 and arranged in mesh with a pair of driven bevel gears 27 which are thus adapted to revolve in opposite directions. Extending laterally and horizontally from the bevel gears 27 is a pair of shafts 28 carrying driving bevel gears 29 at their outer extremities. Geared to said last named bevel gears is a pair of longitudinally extending propeller shafts 30 which are journaled in opposite sides of the main frame 1 as illustrated in Fig. 2. The latter shafts are adapted to revolve in opposite directions and each carries a pair of centrifugal propellers 31 having curved blades 31'. The direction of rotation of propellers 31 is such that the outer portions of the same move downwardly and the inner portions upwardly, and in order to render the upward movement of these propellers ineffective semicircular housings 32 are provided in the main frame 1 and so arranged as to inclose the inner halves of all of the centrifugal propellers 31. This construction will be clear by reference to Fig. 3 which shows the housings 32 in end elevation. The centrifugal propellers 31 revolve as indicated by arrows in Fig. 3 and produce a vertical thrust suffi-

cient for elevation of the machine when starting, the helical propellers 18 and 19 being at this time inoperative. In order to support the central portions of the shafts 30 a laterally extending bracket 33 is provided in each housing 32 as illustrated in Figs. 2 and 3. These brackets also reinforce the connection of the bevel gear 29 with the shaft 30. Inclined auxiliary planes 35 disposed diagonally in oscillatory frames 36 coöperate with the rudder 14 for deflecting the course of the machine. The operating wires for these planes connect with the drums 37 as shown in the several views.

15 The operation of the machine is as follows: Assuming that the motors 16 and 25 are ready for operation, then after the pilot is seated upon the seat 6 the motor driving the centrifugal propellers 31 is started, the clutch 23 between the motor shafts 17 and 24 remaining open. The result of the vertical thrust of the combined action of the centrifugal propellers 31 is to elevate the machine without moving the same longitudinally. After a sufficient altitude has been reached then the other motor is started which causes the helical propellers 18 and 19 to produce a horizontal thrust which drives the machine in the desired direction.

20 If desired the motor shafts 17 and 24 may be clutched together by means of the tooth clutch 23, which will cause all of the propellers to revolve at the same speed, thus facilitating equilibrium of the machine.

25 Provided at the forward extremity of the forward centrifugal propellers 31 are helical blades 31' which causes these propellers to exert a horizontal as well as a vertical thrust. The blades 31' also reinforce the curved blades 31', the latter being provided with members 34 which serve to prevent the air caught by the blades from moving to the center of the propellers, thus rendering the same more effective than they otherwise would be. The members 34 are shown in dotted lines in Fig. 3, and the construction and purpose thereof will be clear to those skilled in the art.

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

While I have illustrated and described the preferred construction for carrying my invention into effect this is capable of variation and modification without departing from the spirit of the invention. I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

I claim—

1. An aeroplane comprising a wheeled-frame, a centrally disposed longitudinally extending motor shaft, a helical propeller carried by the forward end of said motor

shaft, a second helical propeller disposed above said first named propeller and arranged in operative relation with said motor shaft, supporting planes rigidly secured to said frame, a longitudinally extending shaft journaled in each side of said frame, a centrifugal propeller having curved substantially radially extending blades carried by each of said last named shafts, a semi-cylindrical housing arranged coaxially with said last named shafts and inclosing the interior half of said centrifugal propellers, the exposed blades of said centrifugal propellers being adapted to move downwardly and the concaved surfaces of which blades are on the under side thereof, and means for driving said centrifugal propellers, substantially as described.

2. An aeroplane comprising a wheeled main frame, a frame extending rearwardly from said second frame and rigidly fastened thereto, a plurality of steering planes mounted for oscillation upon the rear extremity of said second frame, means for operating said planes, a central longitudinally extending motor shaft projecting from the front side of said main frame, a helical propeller carried at the forward extremity of said motor shaft, a second helical propeller arranged above the first named propeller and adapted to rotate in the same direction, a pair of planes arranged above and transversely of said main frame, a pair of longitudinally extending shafts carried on each side of said main frame, means connected with said motor shaft for driving said last named shafts, a centrifugal propeller carried by each of the latter and adapted to rotate in opposite directions, a semi-cylindrical housing arranged coaxially with each of said last named shafts and adapted to inclose the inner half of the corresponding propeller, the blades of said centrifugal propellers being curved so that the surfaces presented against the air are concave, and a pilot seat arranged adjacent said motor shaft and within access of the actuating means for said steering planes, substantially as described.

3. An aeroplane comprising a wheeled main frame, an extension to said main frame projecting rearwardly therefrom, a plurality of oscillatory steering planes mounted upon the rear extremity of said extension, a pilot seat supported in said main frame, means for actuating said steering planes and arranged within access of a pilot on said seat, a centrally disposed longitudinally extending motor shaft projecting from the front end of said main frame, a helical propeller carried by said shaft, a second helical propeller arranged above said first named propeller and adapted to rotate in the same direction, means connecting said second named propeller with said motor

shaft, a longitudinally extending shaft jour-
naled in each side of said main frame, and
disposed parallel with said motor shaft, a
motor arranged in operative relation with
said last named shafts and adapted to drive
the same in opposite directions, a pair of
centrifugal propellers carried on each of
said last named shafts, a semi-cylindrical
housing arranged adjacent each of said last
named shafts and adapted to inclose the in-
ner halves of the pair of propellers mounted
thereon, the exposed blades of said centrif-

ugal propellers being concave on the under-
side thereof and adapted to move down-
wardly, and means for clutching said motor
shaft with the shaft of said motor, substan-
tially as described.

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

ERNEST MAREK.

Witnesses:

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HELEN F. LILLIS.