

C. KRAMER.
AEROPLANE.

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988,113.

Patented Mar. 28, 1911.

4 SHEETS—SHEET 1.

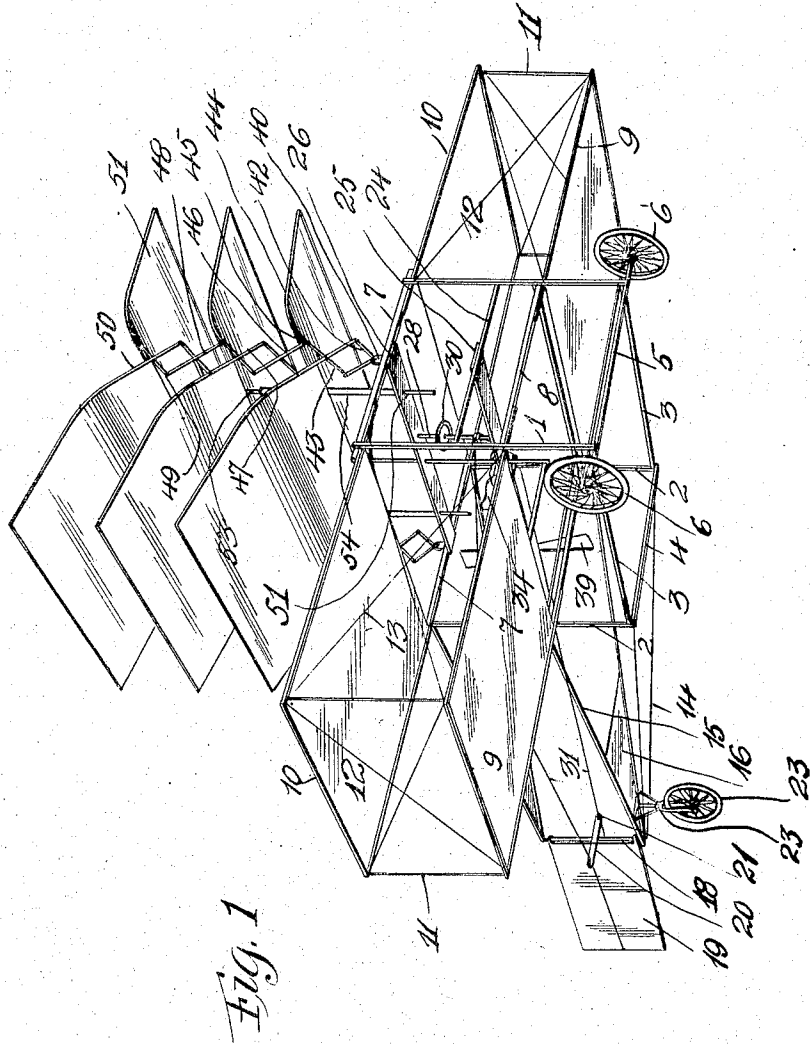


Fig. 1

WITNESSES

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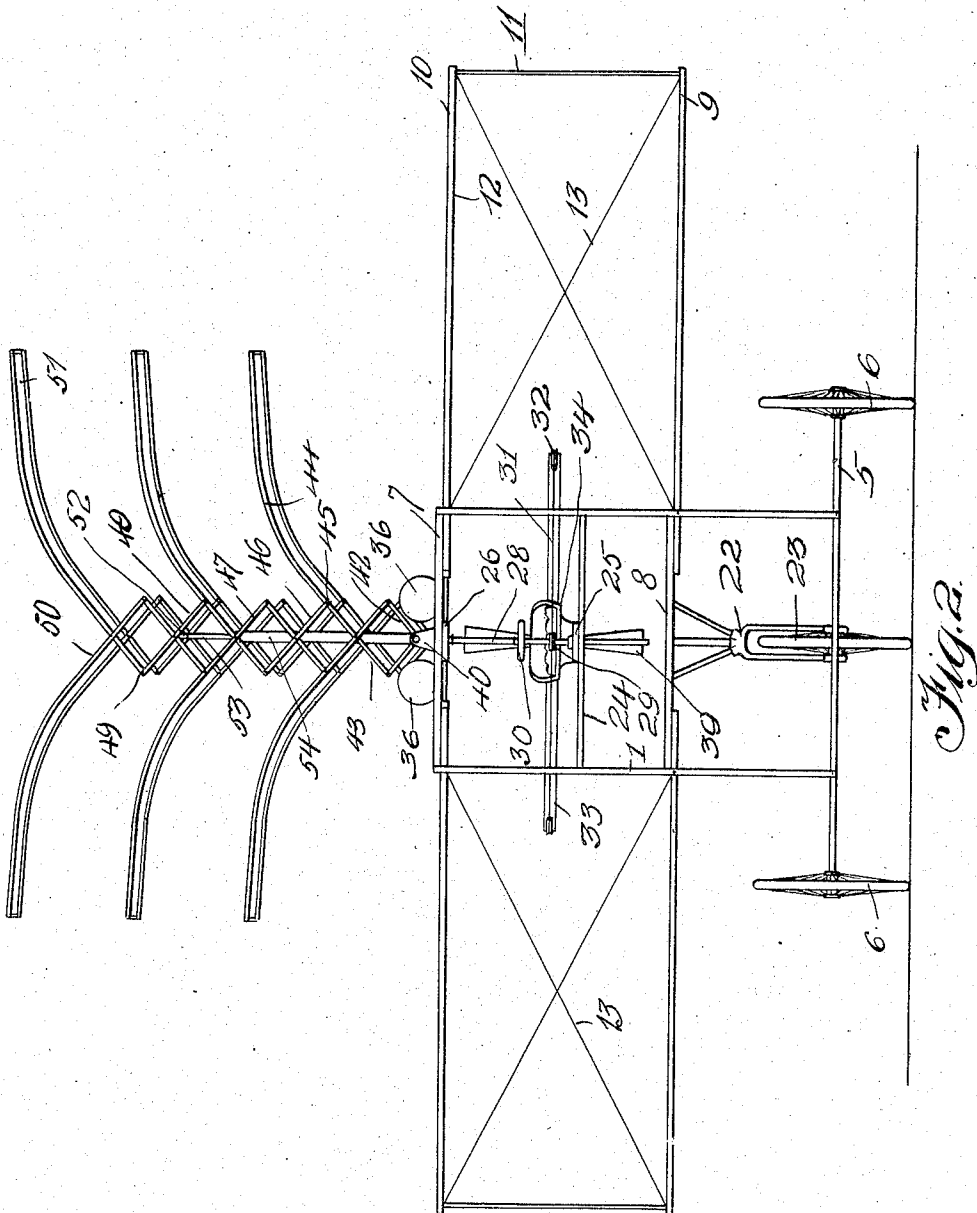
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4 SHEETS—SHEET 2.



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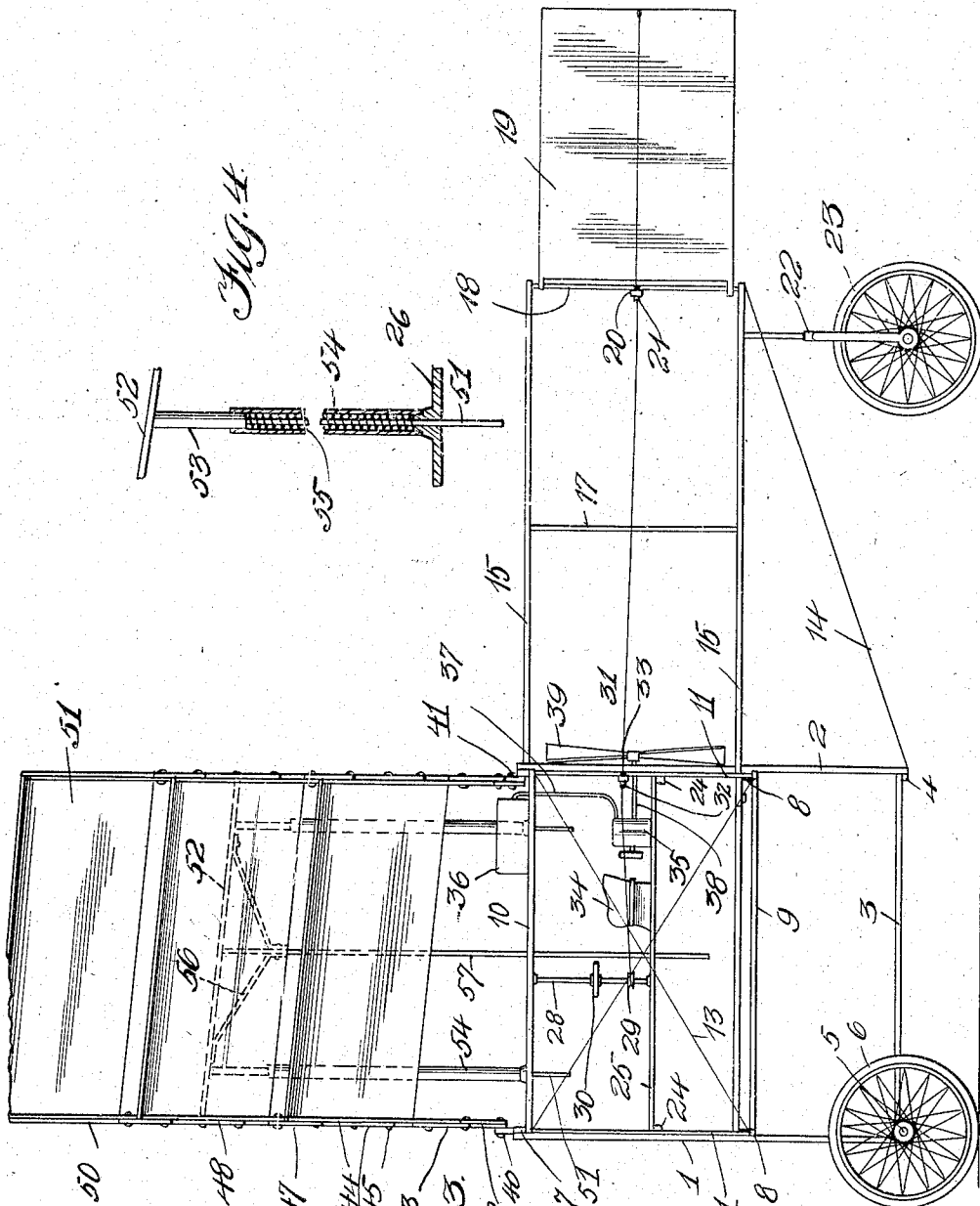
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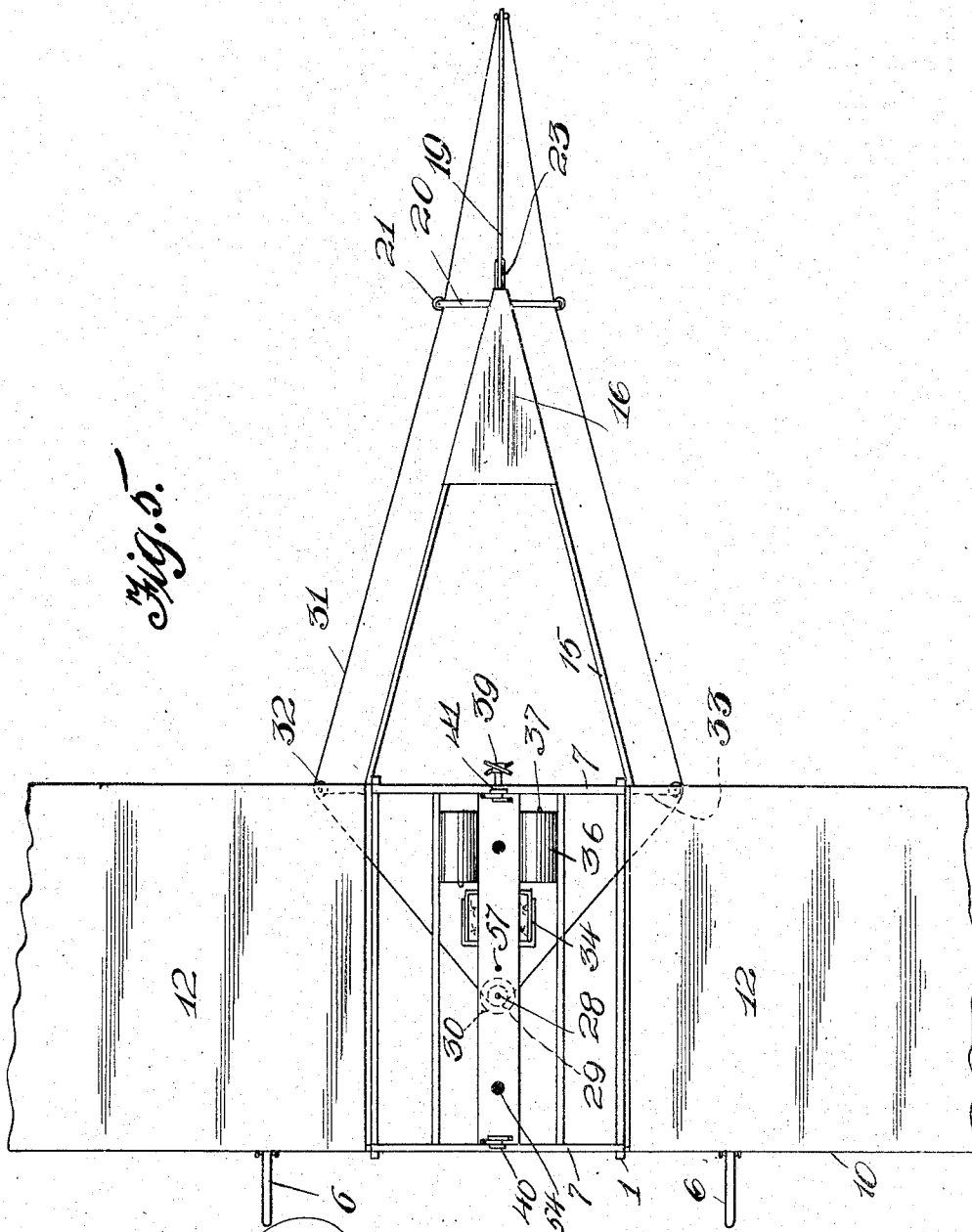
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UNITED STATES PATENT OFFICE.

CHARLES KRAMER, OF NORTH BRADDOCK, PENNSYLVANIA.

AEROPLANE.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES KRAMER, a citizen of the United States of America, residing at North Braddock, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Aeroplanes, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to aeroplanes, and the object of my invention is to provide an aeroplane with superimposed sets of oscillatory planes that can be operated to raise or lower the aeroplane.

Another object of this invention is to provide a biplane with oscillatory planes that will assist in maintaining the stability of the machine when in operation.

A further object of the invention is to provide an aeroplane that is simple in construction, durable, safe, compact, and efficient for aeronautical purposes.

With the above and such other objects in view as may hereinafter appear the invention consists of the novel construction, combination, and arrangement of parts to be hereinafter specifically described and then claimed.

Reference will now be had to the drawings forming a part of this specification wherein:

Figure 1 is a perspective view of the aeroplane. Fig. 2 is a front elevation of the same. Fig. 3 is a side elevation of the aeroplane. Fig. 4 is a vertical sectional view of a portion of a spring socket adapted to form part of the machine, and Fig. 5 is a horizontal sectional view of a portion of the machine.

To put my invention into practice, I provide forward posts 1 and rear posts 2, the lower ends of said posts being connected by longitudinal braces 3, a transverse brace 4, and a transverse axle 5, said axle having the ends thereof provided with revoluble wheels 6 constructed upon the principle of bicycle wheels. The posts 1 and 2 have the upper ends thereof connected by transverse braces 7 and intermediate the ends thereof by transverse braces 8 and longitudinal braces 9.

Suitably connected to the braces 7 and 8 are the inner ends of horizontal frames 10, these frames having the outer ends thereof connected by vertical rods 11, and each frame is provided with a sheet of canvas or other material 12, whereby the superimposed

frames will constitute the biplanes of the machine. It is preferable to brace the frames by diagonally-disposed wires 13.

Extending rearwardly from the posts 2 are two sets of spars 15 having the rear ends thereof converged and connected by triangular pieces of canvas 16, providing planes which in conjunction with the spars constitute the tail of the machine. The sets of spars intermediate the ends thereof are connected by vertical rods 17 and by a vertical rod 18 at the converging ends thereof. Pivotaly mounted upon the rod 18 is the forward end of a vertical rudder 19 and said rod intermediate the ends thereof is provided with a cross-head 20 having sheaves 21 journaled in the outer ends thereof, the object of which will presently appear. The lower set of spars 15 have the outer ends thereof connected by wires 14 to the ends of the brace 4, and these spars adjacent to the converging ends thereof are provided with a depending fork 22 for a revoluble wheel 23 similar in construction to the wheels 6. The posts 1 and the posts 2 are connected by additional braces 24 arranged above the braces 8 and connecting the braces 24 intermediate the ends thereof is a platform 25. A similar platform 26 connects the braces 7 and 8 revolubly supported by said platforms is a vertical shaft 28 upon which is mounted a sheave 29 and a hand wheel 30. A cable 31 passes around the sheave 29 and outwardly over sheaves 32 journaled in a transverse arm 33, carried by the posts 2. The cable extends rearwardly over the sheaves 21 and connects with the outer edge of the vertical rudder 19.

Upon the platform 25 is mounted a seat 34 and a gasolene engine or other suitable power 35. The engine is supplied with gasolene from the reservoir 36 on the platform 26, through the medium of a pipe 37 extending from the reservoir to the engine. The driving shaft 38 of the engine extends rearwardly and is provided with a suitable propeller 39.

The braces 7 intermediate the ends thereof are provided with longitudinally aligned bearings 40 and 41, the bearing 40 being of a greater height than the bearing 41 for an object that will presently appear. Connected to these bearings are two sets of pivoted arms and links constructed upon the principle of lazy tongs. Links 42 are pivotaly connected to the bearings and pivot-

ally connected to the outer ends of these links are pivoted arms 43, the outer ends of said arms being curved, as at 44. Pivotally connected to the arms 43, as at 45, are pivoted links 46 and the upper ends of these links are pivotally connected to arms 47 similar to the arms 43. The arms 47 are pivotally connected to the lower ends of pivoted links 48 similar to the links 46, and the upper ends of the links 48 are pivotally connected, as at 49, to pivoted arms 50 similar to the arms 43 and 47, thus providing three sets of oppositely disposed curved arms and these arms are adapted to support pieces of canvas 51 or other material constituting planes.

The links 48 are connected by a longitudinal bar 52 and connected to this bar contiguous to the ends thereof are plungers 53 adapted to extend into vertical sockets 54 mounted upon the platform 26. The lower ends of the plungers 53 are reduced, as at 55, and are adapted to extend through the platform 26. Encircling the reduced ends 51 of the plungers 53 within the sockets 54 are coiled springs 55*. Connected to the bar 52 is a depending stirrup 56 and connected to said stirrup is an actuating rod 57 adapted to extend downwardly through the platforms 26 and 25.

An operator located upon the platform 25 can start the engine 35 and when the propeller 39 is revolved the machine will be driven forward and can be guided either to the right or left through the medium of the hand wheel 30, shaft 28, sheave 29, cable 31, and the vertical rudder 19. When the vertically-disposed rod 57 is reciprocated by the operator, two sets of oscillatory frames will be moved to raise the machine from the ground, and by making the bearing 40 a greater height than the bearing 41, these planes will be tilted rearwardly, consequently when the machine is in motion it will have a tendency to ascend. These planes also cooperate with the horizontal planes in maintaining the stability of the machine in flight, and with the superimposed planes in practically a horizontal position, a large supporting area is provided, while with the planes raised to almost a vertical position the additional supporting area is reduced and it is in this manner that the elevation of the machine when soaring or gliding can be easily regulated.

From the foregoing it will be observed that I have devised a machine embodying a central rectangular structure for the operator, laterally projecting bi-planes, a rearwardly projecting tail and rudder, superimposed oscillatory planes, all cooperating to provide a light and durable structure that can be safely manipulated.

In the drawing I have illustrated the preferred embodiment of my invention, but

it is to be understood that the structural elements thereof can be varied or changed, as to the size, shape and manner of assemblage without departing from the scope of the invention.

Having now described my invention what I claim as new, is:—

1. In an aeroplane, a rectangular structure, laterally projecting planes carried by the sides of said structure, a rearwardly extending tail carried by said structure, and superimposed sets of oscillatory planes arranged above said structure and adapted to be oscillated from within said structure, said oscillatory planes having connections constructed upon the principle of lazy tongs.

2. In an aeroplane, a rectangular structure, laterally projecting bi-planes carried by the sides of said structure, a rearwardly extending tail carried by said structure, a vertical rudder supported by said tail and adapted to be adjusted from within said structure, superimposed sets of oscillatory planes arranged above said structure and adapted to be oscillated from within said structure, and a revoluble propeller arranged within said tail at the rear side of said structure.

3. An aeroplane embodying a rectangular structure, bi-planes supported by the sides thereof, sets of superimposed oscillatory planes arranged above said structure and having connections constructed upon the principle of lazy tongs, a revoluble propeller supported by said structure, and means within said structure for revolving said propeller.

4. The combination with an aeroplane of the bi-plane construction, of two sets of oscillatory planes arranged above said structure, the planes of each set being superposed with respect to each other, means constituting two pairs of lazy tongs for pivotally connecting the oscillatory planes together, and vertically disposed means connected with said oscillatory planes for maintaining them in parallel planes.

5. In an aeroplane, the combination of a rectangular structure, laterally projecting biplanes carried thereby, a rearwardly projecting tail supported by said structure, and a series of superimposed oscillatory planes arranged over said structure and pivotally connected together, each of said planes having an inclined inner portion and a substantially flat outer portion, said planes arranged in sets and with the planes of one set projecting in opposite directions with respect to the planes of the other set, and means for shifting the planes of the set simultaneously.

6. In an aeroplane, the combination of a rectangular structure, laterally projecting biplanes carried thereby, a rearwardly projecting tail supported by said structure, and

a series of superimposed oscillatory planes arranged over said structure and pivotally connected together, each of said planes having an inclined inner portion and a substantially flat outer portion, said planes arranged in sets and with the planes of one set projecting in opposite directions with respect to the planes of the other set, means for shifting the planes of the set simultaneously, and a rudder carried by said tail and adapted to be actuated from within the structure.

7. In an aeroplane, the combination of a rectangular structure, laterally-projecting biplanes carried thereby, a rearwardly pro-

jecting tail supported by said structure, a rudder carried by the tail and actuated from within the structure, two sets of oscillatory planes arranged above said structure, means for pivotally connecting said planes together and to said structure, said means operating upon the principle of lazy tongs, and means operated from within the structure for shifting the oscillatory planes. 20

In testimony whereof I affix my signature 25 in the presence of two witnesses.

CHARLES KRAMER.

Witnesses:

MAX H. SROLOVITZ,
K. H. BUTLER.

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