Oct. 6, 1931. A. B. BROLUSKA 1,826,048

AEROPLANE

Original Filed March 9, 1928 7 Sheets-Sheet 1

Fig. 1

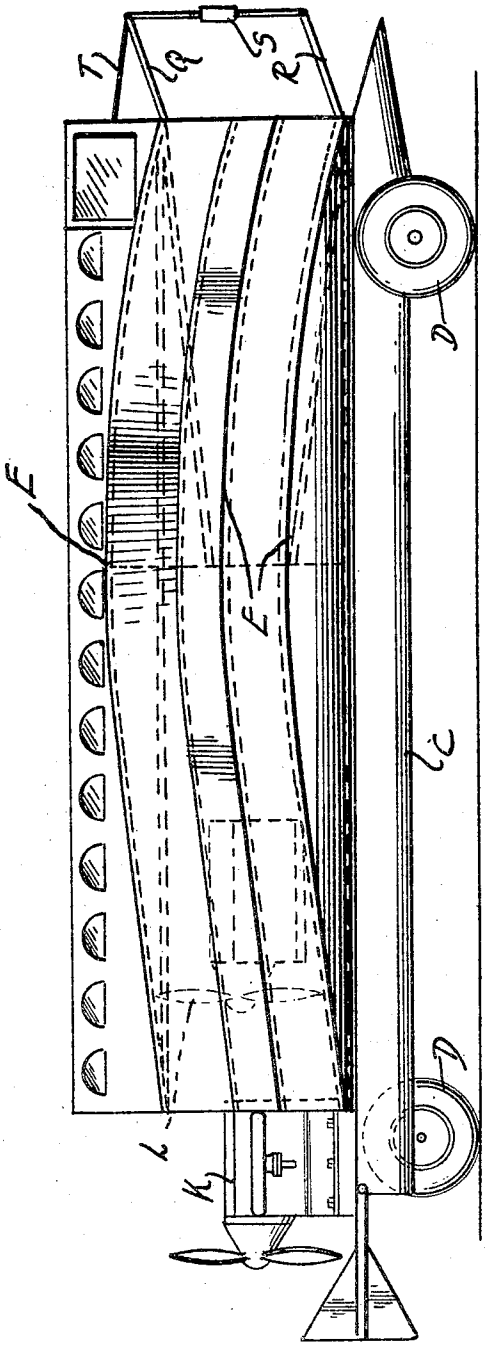
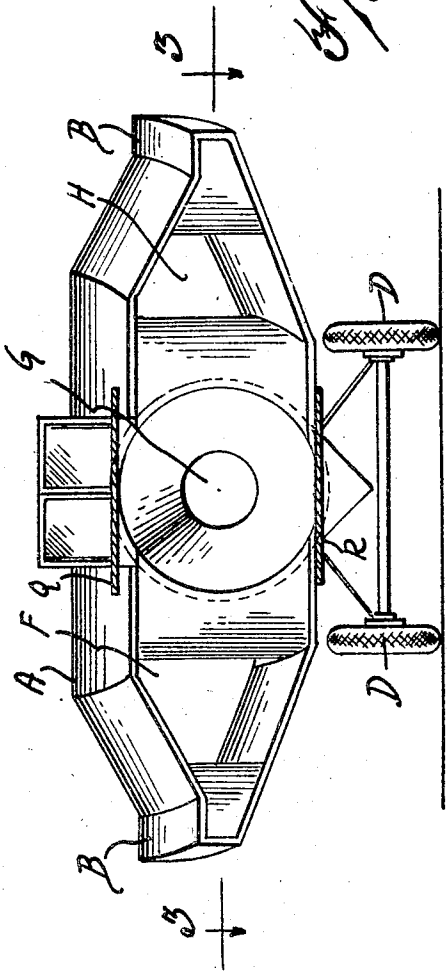


Fig. 2



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BY Cowan & Bryce

ATTORNEYS

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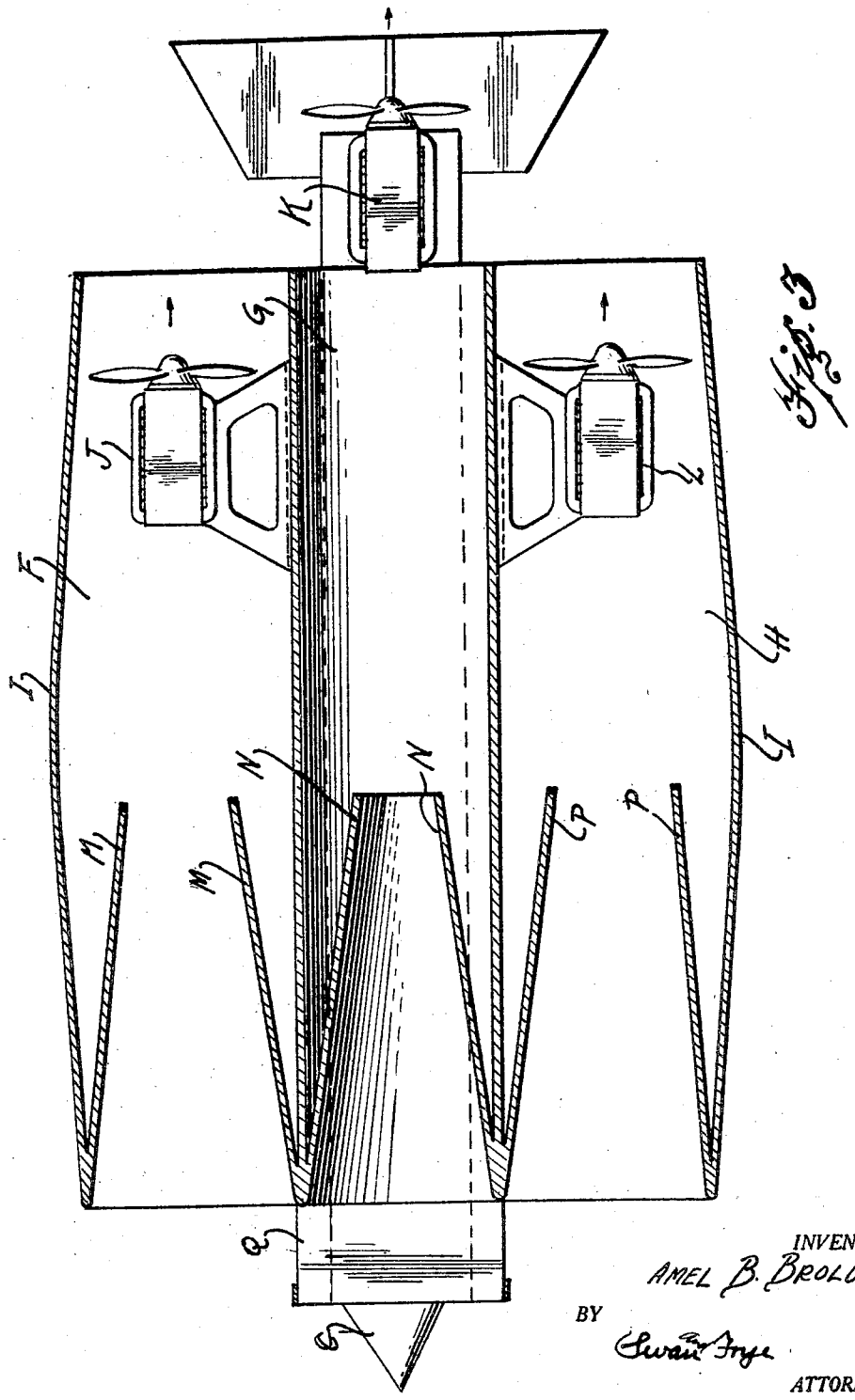


Fig. 3

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Swan & Pope
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AEROPLANE

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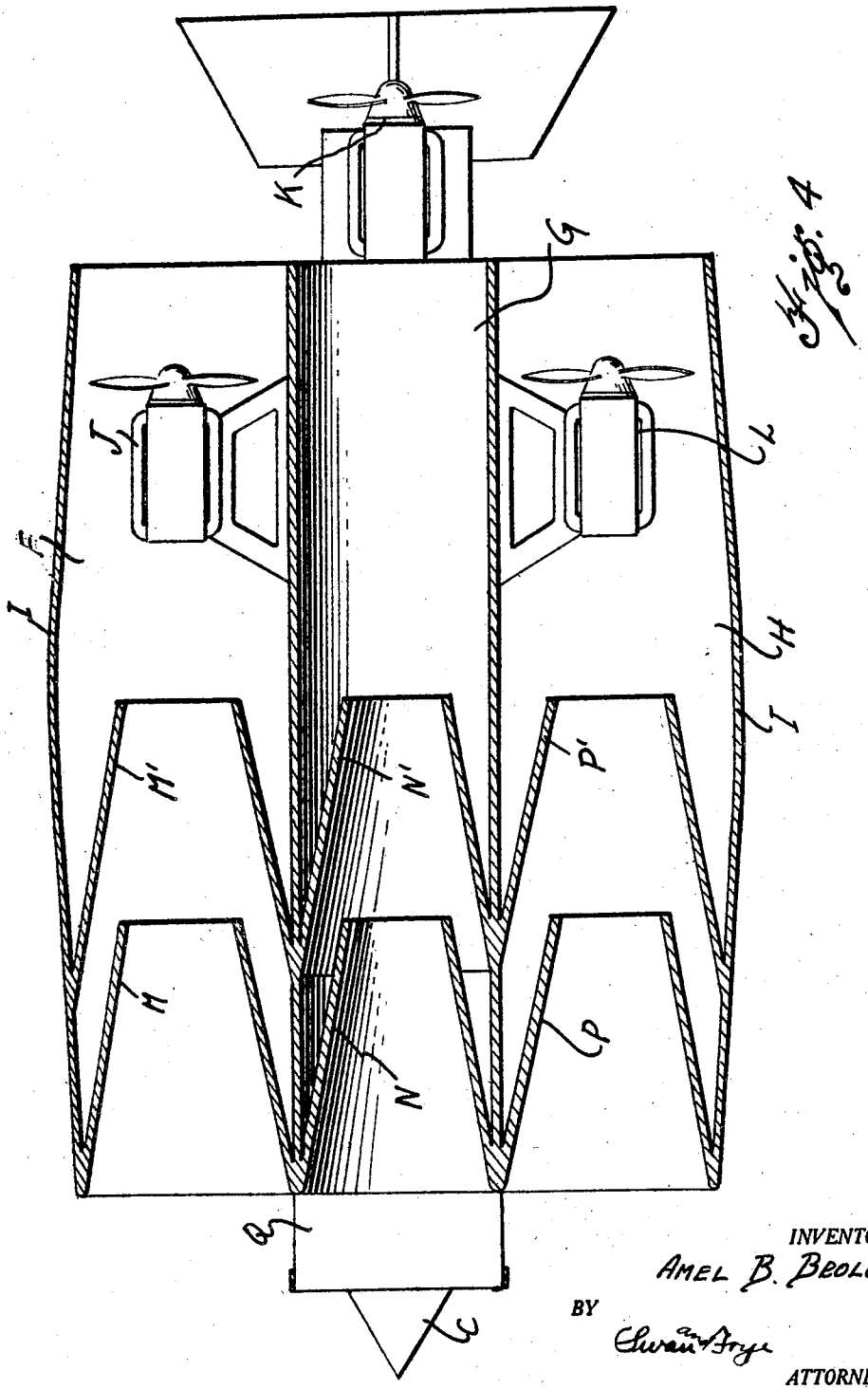


Fig. 4

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Shuman & Joyce
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AEROPLANE

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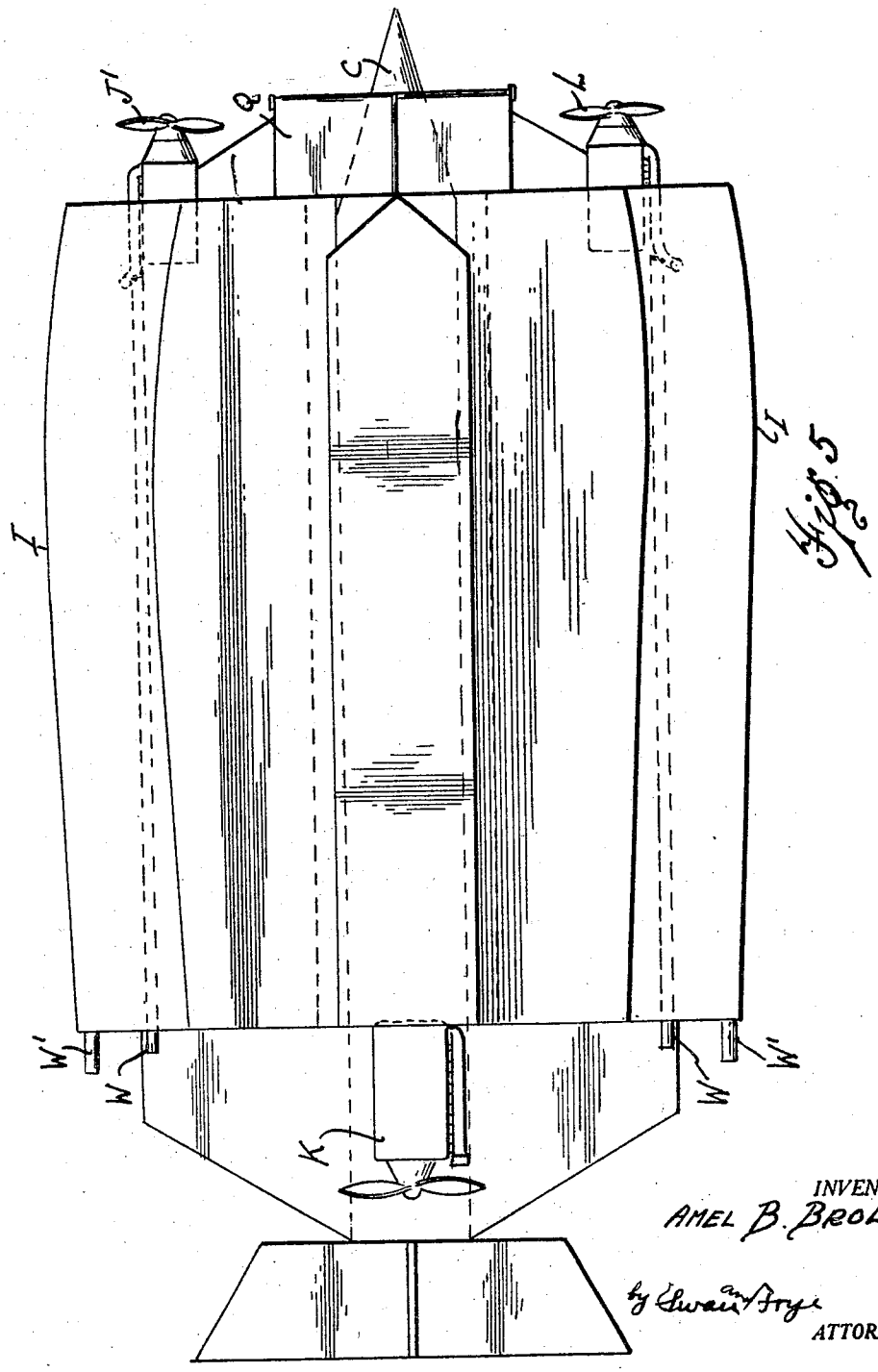


Fig. 5

INVENTOR.
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AEROPLANE

Original Filed March 9, 1928 7 Sheets-Sheet 5

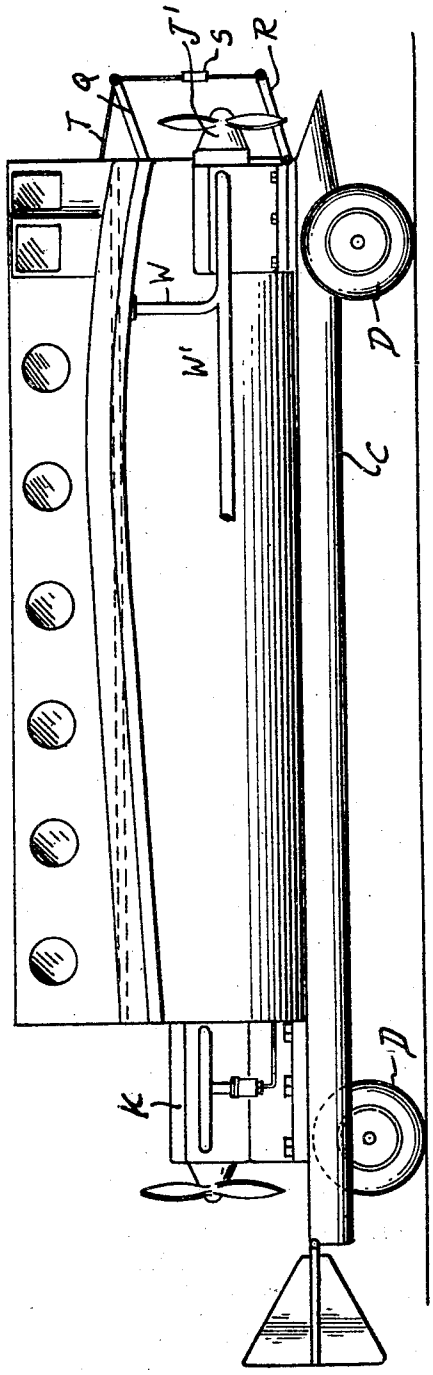


Fig. 6

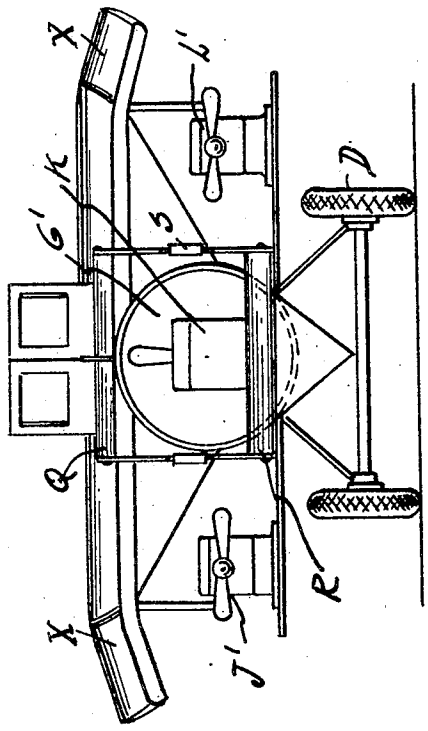


Fig. 7

INVENTOR.
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BY Swan & Frye

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Oct. 6, 1931. A. B. BROLUSKA 1,826,048

AEROPLANE

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Fig. 8

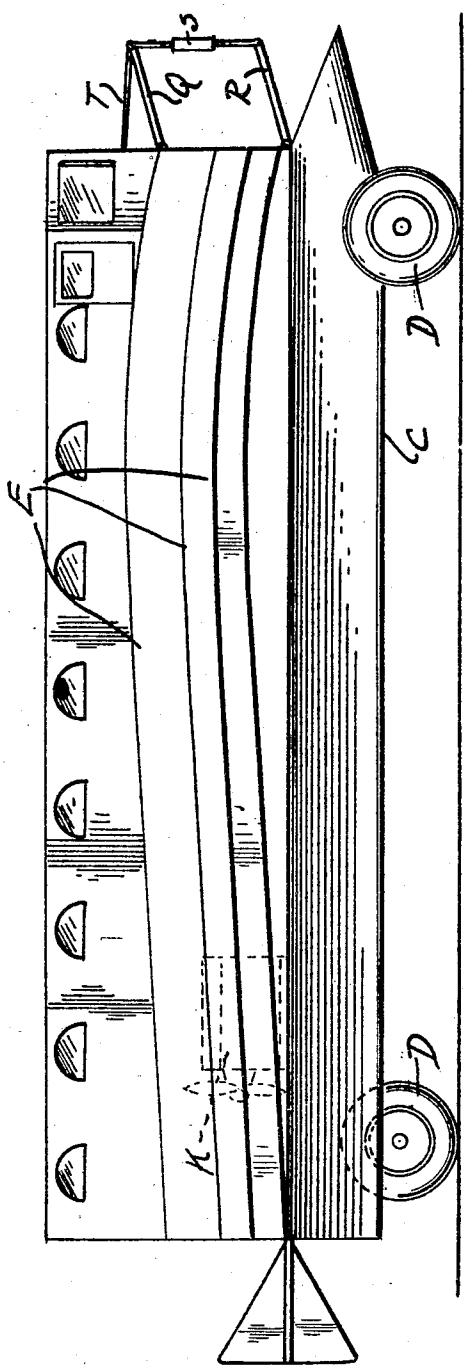
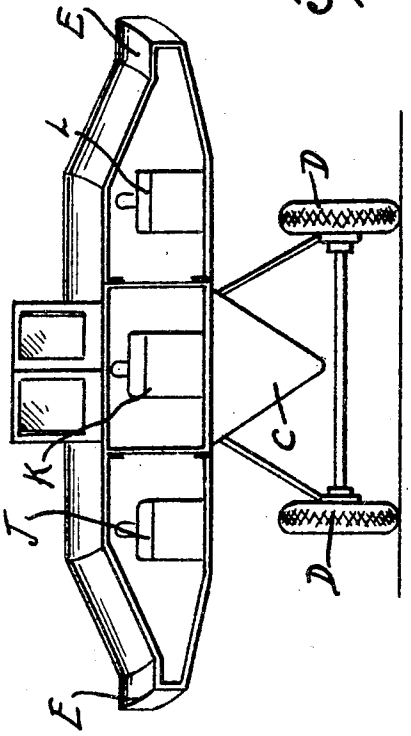


Fig. 9



INVENTOR.
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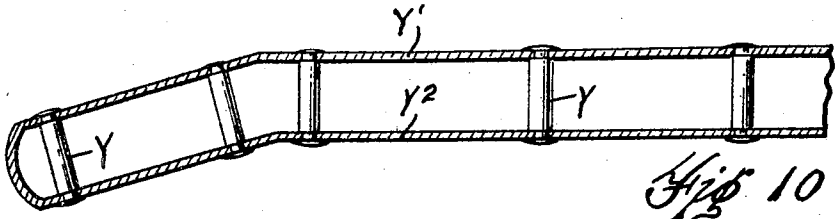


Fig. 10

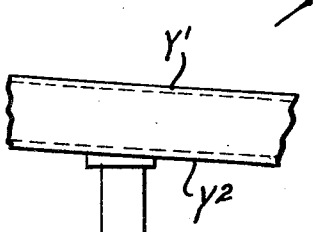
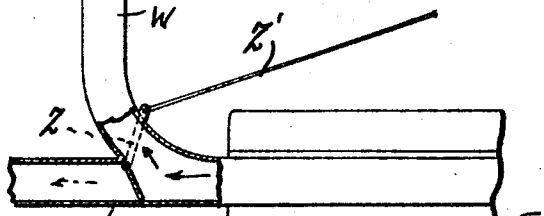
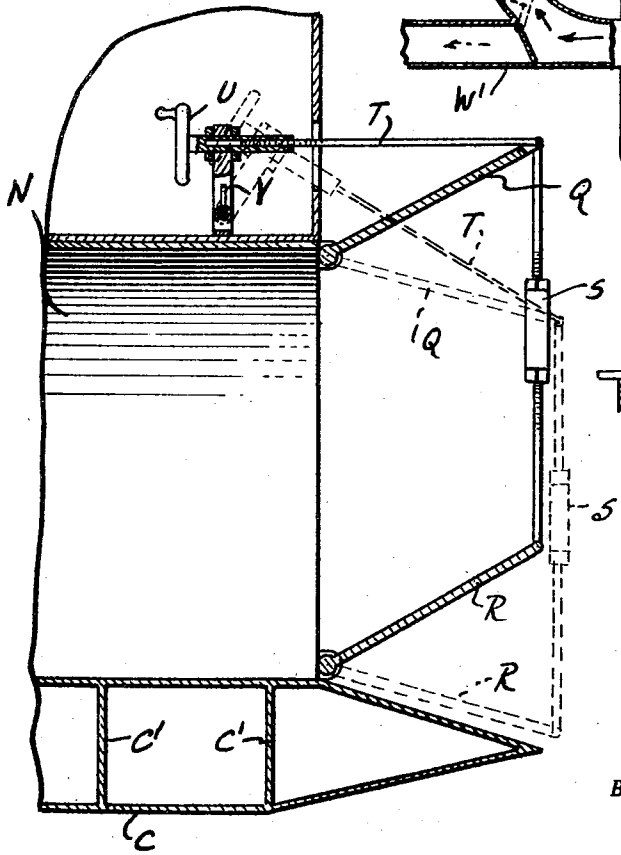


Fig. 11





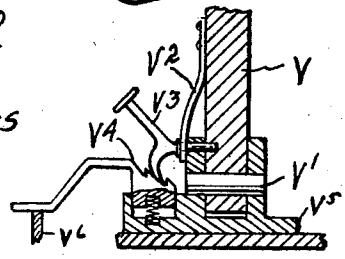


Fig. 13

Fig. 12

INVENTOR.
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Patented Oct. 6, 1931

1,826,048

UNITED STATES PATENT OFFICE

AMEL B. BROLUSKA, OF DETROIT, MICHIGAN

AEROPLANE

Refile of abandoned application Serial No. 260,329, filed March 9, 1928. This application filed April 19, 1930. Serial No. 446,116.

This invention relates to an improved aeroplane construction and has for its object an organization of parts by means of which the travel of the aeroplane through the air and its directional guidance relatively to the horizon may be effected through the continuing creation of a vacuum condition in the air immediately in front of and surrounding the aeroplane at any time, combined with the propulsive effect upon the aeroplane relatively to the air rearwardly thereof exerted by a series of propeller units. With these features are included as well means for maintaining the initial buoyancy of the aeroplane structure when it first takes the air, despite the tendency of frozen air particles to accumulate upon the aeroplane structure and wings, and thus weight it down, often to the degree of forcing a landing, despite the continued functioning of the structurally propulsive parts as such.

In the drawings:

Figure 1 is a side elevational view of my improved type of aeroplane construction as applied to a biplane.

Figure 2 is a front elevational view thereof.

Figure 3 is a plan view in section along the line 3—3 of Figure 2, and looking in the direction of the arrows there shown.

Figure 4 is a similar lan view of a slightly modified form of construction wherein two spaced tapering attenuations or vane members are provided in each of the lengthwise extending passages of the aeroplane frame structure.

Figure 5 is a plan view indicating in dotted lines the preferred embodiment of my heat-distributing means for keeping the exterior of the aeroplane free from ice particles.

Figure 6 is a side elevational view, similar to Figure 1, but of a monoplane structure instead of a biplane, and emphasizing the heat-distributing means just mentioned.

Figure 7 is an elevational view of a monoplane such as is shown side elevationally in Figure 6, taken from a position in the rear thereof.

Figure 8 is a view similar to Figure 1, though with the upper or frame structure shown in full lines as regards the central longitudinal passage, to additionally emphasize the functioning of the baffle members positioned at the forward end thereof.

Figure 9 is a partly perspective elevational view differing from Figure 7 in that the frame and wing construction therein shown is for a biplane rather than a monoplane.

Figure 10 is an enlarged sectional view bringing out the preferred hollow or air space formation of the wing members.

Figure 11 is a detail elevational view showing the regulatable means for opening or shutting off the supply of heated exhaust air relatively to the interior of the wing structures.

Figure 12 is a detail elevational view largely in section, showing the regulatability of the position of the baffles at the forward end of the central passage in the aeroplane frame for exerting the directional influence upon the travel thereof relatively to the horizon.

Figure 13 is a detail elevational view, taken at right angles from the position illustrated in Figure 12, illustrating a preferred means of locking and releasing the baffle-regulating strut.

A represents the frame and B the more or less truncated wing members of an aeroplane structure which may, if desired, be provided with a subjacent buoyant body C and landing wheels D. As brought out in Figure 12 this buoyant body C may if desired be divided into a number of watertight compartments by partitions C′. The various component walls of this frame and wing structure are so arranged as to form a trio of generally lengthwise passages F, G, and H, open at both ends and preferably arched, as brought out at E in Figure 1. Similarly the bordering or extreme lateral edges I of the wing members are slightly bulged or outwardly curved from front to rear, for contributing to the same ease of movement through the air as in the case of the contouring of the hull of a boat toward the stern, and thus securing what additional propulsive effect may be had from the inrush of air against the inwardly curving portion of such edge toward the rear of the plane as it passes through the air.

Appurtenant each of these passages F, G,

and H, are propeller units as J, K, and L respectively, which in operation not only exercise a propulsive effect upon the aeroplane structure as a whole relatively to the air in the rear thereof, but as well and contemporaneously exercise a suctional effect through the respective passages upon the air forwardly of an aeroplane, thus constantly tending toward the creation of a vacuum condition forwardly thereof whose influence is to draw the aeroplane structure into the pocket by lowered pressure constantly being created in front of the aeroplane. This vacuum-inducing condition is heightened and contributed to by the presence of the inwardly tapering vane members M, N, and P in the passages F, G, and H respectively; these reduce the net effective or available space through which the indrawn air can pass and in cooperation with the adjacent walls of their respective passages form vacuum pockets or spaces which heighten the suctional effect due to the action of the propeller units. In Figure 3 I have illustrated the positioning of a single one of these attenuating vane structures in their respective passages, and under most circumstances this contribution toward a vacuum-inducing condition with respect to the air currents through the passages and to the air space immediately in front of the aeroplane will be found sufficient. But illustrative of the possibilities of the further vacuum-creating effect to which such a construction contributes, I have shown in Figure 4 a pair of such tapering members suitably spaced from one another, as M and M′ in the passage F, N and N′ in the passage G, and P and P′ in the passage H. The exact positioning of these and the relative size of the openings must of course be made a matter of design and calculation according to the size and requirements of any particular aeroplane structure. Thus the action of the aeroplane in use results in the creation of a constant pressure lowered condition in the air immediately in front of it which contributes very materially to the possible increased speed of the aeroplane in addition to that accruing from the propulsive effect of the propeller units.

Appurtenant the forward end of the central one of the passageways, as G, are hingedly positioned a pair of baffle members, as Q and R, operatively united by means of the turn-buckle-regulated rod S, and angularly adjustable by proper actuation of the link T and handwheel U, which operatively engages through the strut V. A suggested form of mechanism for locking the strut V according to the angular position that it is desired to link T shall occupy is shown in Figure 13, which, as heretofore stated, is taken from a position right angularly of the position shown in Figure 12. The strut V is rockable about the pivot pin V′, which anchors it to a suitable base V^5, and carries on one side a leaf spring V^2, which resiliently holds the locking pin V^3 in position through registering holes in the strut V and the base V^5. The lower detent point of the locking pin V^3 engages the ratcheted surface of the spring-pressed locking foot V^4 so that only when the latter is depressed by downward pull upon its projecting handle portion, either manually or through the medium of the cord V^6 is the locking pin V^3 able to release the strut V for the swinging action described. By regulation of the angularity of these baffle members Q and R relatively to the walls of the passage G, the angular direction of entrance of the indrawn air, and consequently of its impact upon the walls of the passage G and of its tapering vane N, may be regulated, thus effecting the directional guidance of the aeroplane's travel relatively to the horizon and when moved to a sufficiently angular position downwardly also act as a wind brake, which tends to slow up the speed of travel of the aeroplane preparatory to landing. When raised to the angular position shown in Figure 12 this would result in directing the nose of the forward end of the aeroplane downwardly, whereas if inclined even slightly in the opposite angular direction, as brought out in dotted lines in Figure 12, the induced travel of the aeroplane would result in tilting the forward end upwardly as for taking off from the ground. Of course, this construction could be applied to each of the flanking passages F and H as well, but for purposes of present illustration, as well as for ordinary aerial work the provision of a single centrally located regulating unit of this type is ample.

In Figure 10 I have shown my preferred embodiment of wing construction for the aeroplane, wherein in preference to a single frame-supported fabric layer, I provide two such layers at Y′ and Y^2, held in suitable spaced relation by the studs or bolts Y. I thus create an air space between the enclosing fabric walls, into which there may be advantageously projected, through the pipes W, the exhaust heat from the various propeller engines, for counteracting the tendency of ice particles to accumulate upon the outside surface of the wing structures, thus weighting the aeroplane down and often forcing its landing. My preferred embodiment of means for diverting this division of the heat is shown in Figure 11 wherein the link regulating damper Z may be used to either direct the exhaust heat through the pipe and thus into the interior of the wing structure shown in Figure 9 or through the pipe W′ to the open air.

In the monoplane construction illustrated in Figures 6 and 7, I have shown the two side or flanking propeller units, as J′ and L′, positioned at the front of the aeroplane

structure, leaving the central unit K′ positioned at the rear, as in the other form described. In this type of device the flanking passages F and H, present in the other types of my invention, are almost wholly done away with, leaving the central longitudinal passage G′ here illustrated as the one functioning unit, cooperatively with the wings X.

What I claim is:

1. In an aeroplane, in combination with a frame and wing structure forming a plurality of substantially lengthwise passages open at each end, inwardly tapering vane members extending from the front end of each passage a portion of the distance to the rear thereof, for aiding in the creation of vacuum conditions incident to the travel of the plane through the air, a combined propelling and vacuum-creating fan appurtenant the rear end of each of said passages, and angularly adjustable vane members appurtenant the front end of the central passage, whereby the direction of impact of the indrawn air is caused to influence the angular direction of movement of the aeroplane relatively to the horizon.

2. In an aeroplane, the combination, with a frame and wing portion formed to constitute a plurality of generally lengthwise extending passages, tapering attenuating vanes extending from the forward ends of said passages a portion of the distance toward the rear ends thereof, propeller units appurtenant the rear ends of said passages, whereby in cooperation with said passages and their vanes there may be created and maintained a vacuum condition in front of and around the body of the aeroplane as a whole, and angularly regulatable baffles positioned at the front end of the central one of said passages whereby the impact of the air current drawn thereinto may be selectively directed relatively to the walls of the passage to influence the angularity of the path of travel of the aeroplane relatively to the horizon.

3. The combination, with an aeroplane frame whose constituent body and wing portions outline a plurality of generally lengthwise extending passages, inwardly tapering baffle members appurtenant the forward portion of certain of said passages, a propeller unit appurtenant the rear end of each of said passages, whereby, in cooperation with the baffle-modified contour of the latter, a vacuum condition is induced in front of and about the plane auxiliary to the propulsive influence of said propeller units, and angularly adjustable blade elements appurtenant the forward end of the center one of said passages, whereby the direction of impact of the entering air upon the walls and baffle members thereof may be varied, thereby influencing the angular direction of movement of the aeroplane as a whole relatively to the horizon.

4. In an aeroplane, in combination with a frame and wing structure having a plurality of generally lengthwise passages, propeller units located adjacent the rear end thereof, whereby propulsive influence is exerted upon the aeroplane and whereby a continuing vacuum influence is exerted through said passages upon the space immediately forward of and about the aeroplane, tapering vane members positioned in the forward end of each of said passages whereby such vacuum influence is increased therewithin, and adjustable baffle members positioned adjacent the forward end of one of said passages whereby the direction of impact of the indrawn air currents against the walls and baffle members thereof may be varied to effect corresponding changes in the angular direction of movement of the aeroplane.

5. In an aeroplane, the combination, with a frame and wing structure provided with generally longitudinal passages from front to rear, of an adjustable baffle member positioned adjacent the forward end of one of said passages for influencing the direction of impact upon its walls of entering air currents, propeller units located adjacent the rear ends of said passages for effecting the expansive indrawing therethrough of the air in front of and surrounding the aeroplane and for exerting a propulsive influence thereupon relatively to the air rearwardly thereof, tapering vane members positioned in the forward end of certain of said passages for effecting an increase in the degree of the tendency toward vacuum conditions created therein by the action of said propeller units, and means for regulatably distributing to relatively remote exposed portions of the aeroplane structure the surplus heat units resulting from the operation of said propeller units.

6. Means for effecting the traveling movement and directional guidance of an aeroplane, comprising a frame and wing construction provided with a plurality of generally lengthwise extending passages, propeller mechanism units positioned adjacent the rear ends of said passages for exerting therethrough a suctional influence on the air forward of the aeroplane and for exerting a propulsive influence upon the aeroplane relatively to the air behind it, vane members positioned in the forward portions of said passages for increasing the vacuum-inducing effect of the suction draw through said passages, and angularly adjustable baffle members positioned appurtenant the front end of one of said passages whereby the angular direction of impact of the indrawn air upon the walls and included vane members thereof may be varied to bring about corresponding changes in the direction of movement of the aeroplane relatively to the horizon.

7. In an aeroplane, in combination with a

frame and wing structure provided with a plurality of generally lengthwise passages, inwardly tapering vane elements positioned in the forward ends of said passages, angularly adjustable baffle members positioned at the forward end of one of said passages, whereby the directional access of air drawn thereinto may be varied, propeller units appurtenant the rear end of each of said passages for exerting a suctional effect through said passages upon the air about and immediately forward of the aeroplane and a propulsive influence upon the aeroplane upon the air rearwardly thereof, and means for regulatably conveying the exhaust heat from said propeller units to relatively remote portions of the wings of the aeroplane to counteract the formation of ice particles thereon.

8. In an aeroplane, in combination with a fuselage structure forming a plurality of generally lengthwise extending passages, and a wing structure certain portions of whose bounding walls are provided with air spaces, inclined vane members positioned in the forward ends of said passages, propeller units located adjacent the rear ends of said passages for exerting a combined suctional effect through them and past said vanes upon the air in front of the aeroplane and a propulsive effect upon the aeroplane as to the air rearwardly thereof, means for regulatably directing the exhaust heat from said propeller units to the air spaces in said wing elements to counteract the accumulation of frozen moisture particles upon the exterior surfaces thereof, and angularly adjustable baffle members positioned adjacent the forward end of one of said passages for varying the angular direction of ingress of the indrawn air against the walls and included vanes thereof, thereby determining the angular line of movement of the aeroplane relatively to the horizon.

9. In an aeroplane, in combination with a frame and wing structure forming a plurality of generally lengthwise extending passages, inclined vane members positioned in the forward ends of said passages, angularly adjustable baffle members positioned at the forward end of one of said passages for exercising a directional influence upon the entering air current relatively to the walls and included vane members thereof, propeller units located adjacent the rear ends of said passages for exerting through them a suction influence upon the air in front of the aeroplane and a propulsive influence upon the aeroplane relatively to the air rearwardly thereof, and a buoyant substructure supported from said frame structure whereby the aeroplane is supported when resting upon either land or water.

10. An aeroplane, having within its frame and wing portions a plurality of generally lengthwise passages provided with vacuum-inducing attenuations adjacent their forward ends, angularly regulatable baffle members positioned adjacent the forward end of one of said passages whereby the angular direction of entrance of indrawn air may be varied, and propeller units positioned operatively adjacent the rear ends of said passages whereby a suctional influence through said passages may be exerted upon the air space toward which the aeroplane is headed and a propulsive influence may be exerted upon the aeroplane relatively to the air rearwardly thereof.

In testimony whereof I sign this specification.

AMEL B. BROLUSKA.