

DENINE GLIDER

M. A. Denine, of Spokane, Wash., kindly sends us details of a novel glider, the publication of which he hopes will stimulate gliding sport among the young men.

We find the tail-less type easier to get off the ground and control than the tail types for the amateur glider-aviator. We have used both and find this type the easier to learn to control. The very flexible rear edge of the elevator and main planes take up the shocks of sudden gusts of wind and help the longitudinal balance accordingly. We do not recommend it as a power machine.

The material consists of two clear spruce planks 20 feet x 12 inches x 1 inch, ash ribs for ailerons, spruce ribs for main planes, one pine board 1/2 inch x 12 inches x 12 feet, one bicycle frame, wire, 3/16-inch bolts, shingle nails, galvanized sheet iron, and a few extras will be needed. Cover with unbleached muslin. Use glue for sizing cloth.

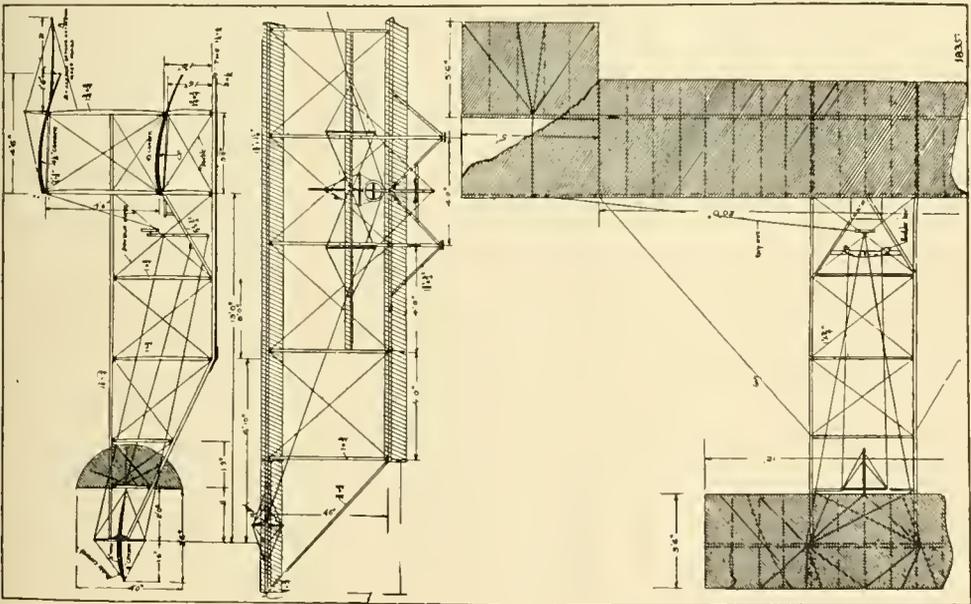
Instructions: Rip beams for main planes from spruce planks, crosspieces for planes, outriggers, struts, etc., as per drawing. Make beams streamline except where strut sockets fit. Sockets can be cut from steel tubing as per drawing. Space sockets on beams 4 feet apart; next attach crosspieces, using galvanized iron strips to hold same in place. Ribs go on next; give them a camber of 4 1/2 inches; attach each rib with three nails and a strip of galvanized iron, two nails for strip and one through rib. When both planes are made, insert struts in sockets and cross-wire each section with No. 16 piano wire, except center section, in which use heavier or double wire. Next, make outrigging, then elevator, and next skids. Use extra heavy wire in outrigging

above skids and for skid braces. It is better to have a little extra weight than a collapse when landing. It cost me three weeks' work to learn to use extra heavy wire on the landing gear.

In attaching outrigging, be sure that when the top beams are level the main planes have an angle of incidence of 4 inches. Attach skids so that the main planes have the same angle on the ground, namely, 4 inches. The glider flies at its ground angle.

Make the extension for the top plane 5 feet x 6 feet 6 inches chord, leaving beams projecting 6 inches on the inside of extensions so that they can be attached to main planes. Where ribs overlap rear beam give them a reverse camber on a steaming board until they reach the position marked "A" in the side elevation drawing. When attaching warp wires, which must be only attached to the top of the aileron, tighten them until the aileron reaches a point just above the line marked "horizontal line." Your warp wires will now have no slack in them and when one aileron is warped up the spring downward of the opposite one will still keep the warp wires taut. Attach extension with steel clamps. Balance glider with pilot in the seat so that when the glider balances over the center of pressure of the main planes there is a weight of 22 pounds on the point of c. of p. of the elevator.

Gliding: Take glider to a hill, with a gentle slope. Do not use a steep hill, as there is always an air hole at the bottom and the glider will fall to the ground at that point of its flight. I fell through one of these pockets four times before discovering what caused the glider to suddenly sink. Take the glider up hill a couple of hundred feet, attach ropes at the ends of the lower plane and to the cross-



bar below elevator; have a boy take each rope and run down hill. The boy with the elevator rope must leave enough slack in his rope to allow the front end of the glider to rise, but as soon as the glider gets into the air must take up all slack, so as not to allow the head end to rise above the horizontal. Instruct the boys towing the glider to increase their speed as soon as it begins to descend. This is absolutely necessary, as, during the first trials the tendency of the operator is to raise his elevator too far and thus lower his speed, so that the glider begins to settle and unless the boys increase their speed, a heavy landing will result.

Now, as to the operating of the controls. In taking your seat see that all controls work smoothly and be sure to try them and look them over carefully, before each flight. Push the elevator column from you until the elevator is at a negative angle of about two degrees and tell the boys on the ropes to start. If the hill you are experimenting on is sandy or covered with grass the glider will have speed enough to rise with a 30- or 40-foot run. Now pull the control column quickly toward you a couple of inches and return it to its original position again; do this two or three times in as many seconds and then pull the column toward you until the elevator has a slight positive angle, and hold it there. The glider will leave the ground now. As soon as it does decrease the angle of the elevator slightly. This will put the machine at a gliding angle and increase the speed. Try to keep as close to the ground as possible. Under no condition must you hold the elevator in the same position as when leaving the ground or increase its angle during the first jump forward; if you do the glider will "stall" and either dive or drop as through an "air hole."

Just before landing bring the elevator control further toward you, and the glider will rise slightly and come down without any shock. After the first few flights you will hardly know when you landed, the shock will be so slight. The lateral control is by the wheel. Turning it to the right raises the left side of the glider, and vice versa. Do not move the ailerons over 2 inches as they are very sensitive and an over-control will tip the glider further over on the opposite side than it was on the side you originally intended to raise. Let the boys on the ropes attend to your lateral balance until you have thoroughly mastered the elevator control. You will find that is about all you will be able to attend to during the first few flights.

Do not use the rudder unless absolutely necessary. After you have mastered all the controls and feel sure you can manage the machine, remove the rope on the elevator. Next try a flight with the ropes attached to the central uprights and last of all with a releasing gear on the ropes so that they can be dropped during flight.

In free flight a glider built with care, and according to the plans illustrated, flights of from two to four hundred yards can easily be made.

We have many of three hundred yards and one of four hundred, although the conditions that we experimented under were nowhere near the best. An aeroplane has never been

able to get up over 800 feet in Spokane, Wash., on account of the condition of the air there. We have gone up in the glider over 70 feet, and if that and our record of four hundred yards cannot be beaten in a lower altitude by some builder of the glider illustrated it will be because it is not built according to the plans.

We will be glad to hear from builders of this glider and will answer any question as to construction and operation of same.—Denine Bros. and Hemingway, 1110 East Indiana Ave., Spokane, Wash.



29 West 39th Street, New York

## OFFICIAL BULLETIN.

### Data Sheets.

The second series of data sheets has been sent out to members, consisting of nearly a hundred sheets.

All members in good standing are entitled to these.

These data sheets provide members with information which could be obtained only at great expense by subscribing to every aeronautical publication issued in the world, by buying every book published, by obtaining reports of every laboratory and testing plant, with the attendant expense of translation and time of abstracting.

The data sheets are issued free to members as fast as they can be prepared.

Membership dues in The Aeronautical Society are \$10 a year, no initiation fee. Members receive data sheets, the magazine, AERONAUTICS, engraved certificate of membership, free monthly lectures. For further information address the Secretary.

Directors' meetings are being held every Thursday evening throughout the summer, as usual. Regular weekly members' meetings are held as usual. The monthly lectures have been suspended for the summer season.

Plans are in progress for the perpetuation of the race around New York as inaugurated last Fall, making it an annual event on a par with the great classics of the sporting world.

### Notice to Delinquents.

Delinquents in payment of dues are earnestly requested to place themselves in good standing at the earliest possible moment in order that they may receive the official bulletin, AERONAUTICS, semi-monthly, the membership certificates and data sheets.