

ines. This has been done by bringing the place of the aviator further forward in the machine than before, by omitting the tail, by using a heavier front control, and by putting the front control at a greater distance from the main supporting aeroplanes. We should give grave consideration to the question whether these changes have, or have not, increased the danger to the aviator in the event of loss of headway.

But why should there have been this tendency of progress in our experiments to bring forward the center of gravity. I think it results from the fact that we naturally desire that our machine should be properly balanced when in rapid flight. The June Bug, in its early days used to climb under the full power of the motor. Instead of remedying this defect by the use of a larger front control we advanced the place of the man, thus violating the important principle that changes of equilibrium should be balanced by the action of moveable surfaces, rather than by changes in the position of the center of gravity.

The center of pressure of course is further forward when a machine is in motion, than when it is stationary in the air; and, in order to be properly balanced, the center of gravity should come under the center of pressure.

The following propositions are important and interesting and should be fully discussed:-

1. If the machine is properly balanced when it has no headway, it will become unbalanced when headway is gained. The head then turns up, with a tendency to continue the turning movement until the head points vertically upwards towards the sky.