

with the supporting surfaces, so as to change the angle of incidence of the latter through the action of the "relative wind" on the upper or lower surface of the tail. This is known as the "Ponard" tail; it is susceptible of great improvement in details of construction, as has been abundantly proved, but it is not yet certain that it will counteract all movements of the center of gravity in meeting sudden wind gusts.

Secondly, by pivoting the wings at their roots, so that they may swing backward and forward horizontally, thus bringing back automatically the center of pressure over the center of gravity, whenever a change occurs in the "relative wind". The so-called "multiple-wing" gliding machine was of this type, and it reduced the movement of the aviator required to meet wind gusts to about 25 millimeters. It cannot, however, be said its construction is perfected.

Thirdly, by hinging vertically the supporting surfaces to the main-frame of the apparatus, so that these surfaces shall change their angle of incidence automatically when required. This last method has only been tested in models, other engagements having prevented experiments this year (1898). The other two methods have been applied to full-sized machines carrying a man. They have given such satisfactory results that not the slightest accident has occurred in two years of experimenting, but their adjustment has not yet reached the consummation originally aimed at, i.e. that the aviator on the gliding machine shall not need to move at all, and that the apparatus shall automatically take care of itself under all circumstances except in landing.