

far out it may be placed in front of the main supporting aeroplanes. The most it can do is to retard the turning movement. It cannot prevent it. The machine retains a tendency to turn completely over until the head points vertically downwards towards the ground.

This is a dangerous tendency not fully realized by us, I think, and the cause not clearly understood by all. Let me try to explain the point.

In a stationary machine if the center of gravity is too far forward for correct balance the machine turns over in front and dives. If it is too far back it turns over backwards and dives stern down; and the safe position for the center of gravity lies somewhere between. Is not this point the geometrical center of surface of the whole machine - the geometrical center of all the surfaces concerned including the front control?

When the machine falls without any motion of translation in the horizontal direction it acquires "downway", not "headway"; and the geometrical center of surface becomes the center of pressure or resistance.

Now as the machine falls the extended surfaces resist the motion, being pushed upwards as it were by the air pressure below. If therefore the center of pressure and the center of gravity are not in the same vertical line, a turning couple is produced which tends to turn the machine around an axis between the centers of pressure and gravity: Or rather in this case, the center of pressure is itself the axis of rotation, for though the air pushes upwards against the surfaces,