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Jan 15 1900

M. [?] Paul

253 W 46. st [?]

Dear Sir.

I have been so pressed with business since my return from Europe, that I have been unable sooner to examine the plans of Mr. Custead enclosed in your letter of the 9th inst.

Mr. Custead's proposed wing movement is quiet ingenious, but I fear that he is sadly estray in his weights. I do not believe a reliable carbon dioxide engine of 35 horse power, including fuel receptacle and supply can be procured to weigh only 150 pounds. But granting that it can, for the sake of argument, as the total weight of the complete machine is stated as 250 lbs, it leaves but 100 pounds for a small [?] long and 12 feet wide, 8 ft deep at centre, for 8 [?], for the shafting, the clutches, the [?], the propeller and rudder [?].

It is clear to me that the 100 lbs must be very greatly increased and that provision must be made also for the weight of two men, one to run the motor

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and the other to steer.

But if the weights are increased the size of the wings must also be increased; far Lilienthal and Pilcher (to say nothing of my own experiments) have found that about $\frac{3}{4}$ of a square foot of surface is required to sustain one pound. If the wing surface is increased, then the weights also increase and more power is required in the motor, so that the impracticality is soon reached.

Mr. Custead's design somewhat resemble that of Struve & Telescheff which was proposed in 1864, or that of [?] in 1871, which would have been too heavy to compare formally with [?].

I send you back the papers. I should not care to take up the proposal in any way.

Yours Truly

O. Chanute