(1) Figure 24 shows the case in which the airship is statically heavy and trimmed nose light. In this case the equation of vertical forces to give constant altitude flight with neutral controls becomes—

$$W = L_g + L_e + L_t + L_s$$

The pilot may be called upon to fly a heavy airship on account of various reasons such as—

(*a*) Collection of moisture if rain is encountered.

(*b*) Leakage in envelope.

(*c*) Loss of superheat.

(*d*) Heavy take-off.

Most airships can carry about 10 percent of their gross lift dynamically at the surface of the earth. Since the dynamic lift varies as the air density, it decreases with altitude. Table III shows results of some experiments on an Italian M type airship at full speed:

TABLE III.—*Lift of Italian M type at full speed*

[In pounds]

Angle of inclination in radiants	Altitude, 3,000 feet				Altitude, 10,000 feet				Altitude, 16,500 feet			
	Total lift	Lift of envelope	Lift of propellers	Lift of fins	Total lift	Lift of envelope	Lift of propellers	Lift of fins	Total lift	Lift of envelope	Lift of propellers	Lift of fins
0.03	1, 224	330	60	834	1, 012	269	48	695	839	218	40	481
0.06	1, 855	612	125	1, 118	1, 542	495	101	946	1, 287	400	82	805
0.09	2, 290	810	200	1, 280	1, 914	657	163	1, 095	1, 608	530	130	948
0.12	2, 497	913	290	1, 294	2, 101	742	235	1, 124	1, 778	599	189	990

(2) Figure 25 shows the case in which the airship is flying statically light at constant altitude with controls in neutral. In this case the equation of the vertical forces becomes—

$$L_g = W + L_e + L_t + L_s$$

(3) In the unusual case in which the airship is in perfect static equilibrium, it will be necessary to trim the airship about 2° nose heavy to overcome the upturning moment of the propeller thrust. So trimmed the airship will fly on an even keel at cruising speed. The motorized observation balloon, having only one ballonet, cannot be trimmed for an individual flight. An approximate 2° nose heavy