5. With the airplane in horizontal flying position, you should next balance the scales under the left and right front wheel and tailwheel and take the reading of the scales. From this reading you must subtract the weight of anything which had to be placed on the platform of the scales to chuck the front wheels or to raise the tailwheel. The weight which has to be subtracted is called TARE. SCALE READING minus TARE is the NET WEIGHT. The net weight of the left front wheel corresponds to W_1 as used in our previous problems. The net weight of the tailwheel corresponds to W_2.

6. Point F of our theoretical problems is the location of the center of gravity. Center of Gravity is defined as the point about which a body would balance in any position. To find this point we proceed as we did in our previous problems. Multiply the distance between the front wheel axle and the tailwheel axle by the tailwheel net weight and divide this product by the empty weight of the aircraft. The aircraft empty weight is found by adding the left and right front wheel net weights and net tailwheel weights. The result thus obtained is the distance of the center of gravity from the front wheel axle.

Let us work a problem:

Find the location of the center of gravity from the front wheel axle using the following data:

Net weight of left front wheel is 372 lbs., right front wheel 378 lbs., tailwheel 50 lbs.

Distance between front wheel axle and tailwheel axle is 200".

Add weights:
372
378
50
800 lbs.

$$\frac{200 \times 50}{800} = \frac{10000}{800} = 12.5$$

The center of gravity location is 12.5" from front wheel axle.

Problem:

Find the location of the center of gravity from the front wheel axle using the following data:

Scale reading: left front wheel is 332 lbs., right front wheel 329 lbs., tailwheel 102 lbs.

Tare: left front wheel 5 lbs., right front wheel 4 lbs., tailwheel 46 lbs.

Distance between front wheel axle and tailwheel axle is 204".

Answer - 16.14"