

simple as possible. At the end of each lecture, there will be several problems to work. If your answers to these questions do not agree with the ones given, do not hesitate to ask me for additional help.

In addition to these short lectures the ambitious student should also read the chapter on "Force" in any High School Physics book and page 104-115 of CAA Manual 18.

The basic principle of a "Weight and Balance" is the law of balanced forces. This law is best illustrated by an example. In figure 1 below you see a beam (A-B) resting on a balancing point (F). At point A and B there is a weight attached ( $W_1$  and  $W_2$ ). If the product obtained by multiplying the distance A-F times  $W_1$  equals the product obtained by multiplying the distance B-F times  $W_2$ , the beam will balance horizontally.



Fig. 1

Let us now use actual values.

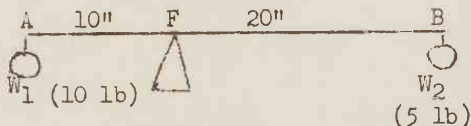


Fig. 2

$$10 \times 10 = 20 \times 5$$

$$100 = 100$$

The distances A-F and B-F are called arms. The product of weight times arm is called moment. Be certain that you understand the meaning of these two terms.

By use of this principle we can calculate any missing quantity, if the other three are given. Let us suppose that in figure 2 we know  $W_1$  is 10 lbs.,

Arm A-F is 10" and  $W_2$  is 5 lbs. To find Arm B-F we multiply  $W_1$  times Arm A-F and divide this product by  $W_2$ .

$$\frac{10 \times 10}{5} = \frac{100}{5} = 20$$

This is the correct answer for Arm B-F in figure 2.

Problems:

- (1) A-F = 25",  $W_1$  = 40 lbs., B-F = 50".  
Find  $W_2$ .                      Ans. 20 lbs.
- (2) A-F = 4",  $W_1$  = 5 lbs., B-F = 2".  
Find  $W_2$ .                      Ans. 10 lbs.
- (3)  $W_1$  = 30 lbs., B-F = 100",  $W_2$  =  
150 lbs. Find A-F.      Ans. 500".

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NEWS ITEM

The Winston-Salem Journal, August 31st, carried the following article, which is of interest to all of us.

"GROAT TO GIVE FLIGHT TESTS

"Frank Groat, vice-president and chief pilot of Piedmont Aviation, Inc., has been authorized by the Civil Aeronautics Authority to give private flight tests at Smith Reynolds Airport. He was one of the first flight examiners appointed outside the CAA, which formerly gave all tests to would-be pilots.

"Groat will be authorized to give all tests for the private pilot's license. He may be reached at the local airport for appointments to give flight tests or written examinations at any time. CAA inspectors will continue to make trips to the airport here but applicants for private pilot's licenses need not wait for the scheduled visits of examiners from Charlotte."