

*A Specialist in Club Design
Explains Difference Between*

Balance Readings and Swinging Weights

By DON TAIT

THERE'S a great deal of misunderstanding among younger pros and even many of the older ones as to the relationship between balance readings and swinging weights.

This is partly due to the fact that many persons have the erroneous impression that information on manufacturers' shipping cartons and display boxes refers to balance and swinging weights as being one and the same thing. As you will see later there is a distinction between the two. They should not be construed as being interchangeable.

The grasping of this fundamental difference, in my estimation, is going to help the pro in his club fitting work. If he will keep in mind that it is possible to keep balance readings constant by either increasing grip weight or head weight or both (and thereby increase the gross weight of the club) he will have a good understanding of the distinction between the two.

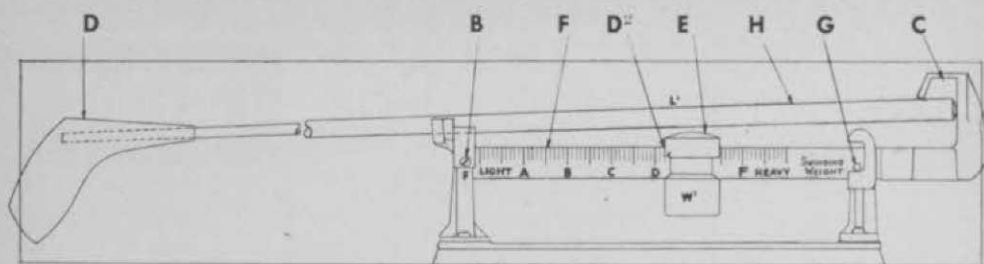
When matching in sets was first introduced some 30 years ago, clubs were assembled with heads, shafts, and grips in

relationship to each other. The results were then checked on a device that recorded all weight forward of the hands in what was truly termed swinging weight. The principle of matching still follows the same or more advanced formulas in some cases.

Although the term, "swinging weight," is here to stay, the recording of head feel on labels of display boxes and shipping cartons is actually a *balance reading* and nothing more. When we stick to standard type stock clubs, all is clear, but if we change the length, build up the grips, or disturb the gross weight in various ways, the readings we get on the balancing machine are apt to get a bit confusing.

Let's take a look at the Lorythmic or Adams scale (at the top of the next page), the device presently used to check results of matching for record purposes and manufacturers' information in general.

The balancing action is set up by the location of the fulcrum point B as against the club rest C and the head end D. For example, with the distance between B and C measuring 14-in., any increase in grip



Lorythmic Swinging Weight Scale

For best results clubs should match within four points.

weight will cause the balance reading to become lighter even though the gross weight increases. To operate this type scale, the machine must be placed on a level plane for accuracy. The club is then placed in position on the scale with the cap end tight against the club rest C. The sliding poise E must next be moved on the beam F until the balance rod G breaks free and hangs in suspension. Readings are always taken from front or left side of sliding poise as illustrated in the sketch.

Weight Compensation

In balancing standard stock woods in sets, the driver in an average D-2 unit will finish 43-in. in length, and gross weight will run pretty close to $13\frac{1}{4}$ ozs. The matching No. 2 wood is usually cut $\frac{1}{2}$ -in. shorter. With the shaft weight and the grip weight remaining the same, the head weight D must be stepped up about $\frac{1}{8}$ oz. over the head weight on the driver to offset the decrease in length of the No. 2 as against the driver. Both clubs will then finish the same balance.

Following the same formula, the No. 3 is cut $\frac{1}{2}$ -in. shorter than the No. 2 Wood and made heavier in both head weight and gross weight, to keep the balance reading at D-2 on all three clubs. The No. 4 Wood is matched to the rest of the set in the same manner. Lighter woods, such as D-0 balance, will finish as light as 13 oz. starting with the Driver at standard length, and the heavier woods will go as high as D-4 to D-6 balance and from $13\frac{3}{8}$ to $13\frac{3}{4}$ ozs. gross in standard clubs.

Matching irons in sets involves the same increase in head weight between clubs to offset the decrease in length. No. 2 irons run between $38\frac{1}{2}$ to $38\frac{3}{4}$ -ins. in most stock sets. Using shafts and grips of predetermined weights, the No. 2 heads on D-2 sets will weigh close to $85\frac{3}{8}$ -ozs. On D-0 sets, the No. 2 heads normally start around

$81\frac{1}{2}$ ozs. and on the heavier D-4 to D-6 sets, the No. 2 heads may go as high as from $8\frac{3}{4}$ to $8\frac{7}{8}$ ozs. This is because of the location of the fulcrum point B and its effect on the head weight D and the grip weight H at standard length. Actually, weight and length increments are a bit more exacting than shown here, but decimals are avoided for clearer understanding.

Same Procedure for Irons

Further, in matching woods, which are long, to irons, which are much shorter, the amount of increase in head weight between clubs on irons is sharply stepped up. Again, this is necessary because of the effect of the fulcrum point B on short length clubs as against those which are longer. To complete a D-2 set of irons as a matching unit, the No. 3 is cut $\frac{1}{2}$ -in. shorter than the No. 2 Iron. The head weight on the No. 3 is increased $\frac{1}{4}$ oz. over the No. 2 head. This in turn causes an increase in the gross weight while the balance remains at D-2.

Keeping the shaft and grip weights the same on all clubs, the head weights and gross weights are then increased in measured amounts from the No. 4 through the No. 9 Iron, to complete the set.

It is on special order type clubs that balance readings often cause confusion.

Following are a few examples of what happens when shaft lengths or grip weights fail to conform to standard stock specifications. Taking grips first, any noticeable increase in grip weight alone brought on either by the use of special all weather grips or a sharp increase in size on a regular leather grip, will cause heavier gross weights but lighter balance readings. The D-2 club with normal medium heavy head and standard length is changed to C-9 or D-0 balance, (though heavier in gross weight) with the application of special heavy type grips. Normal head weights

and normal grips then mean standard balance readings on regular length clubs.

If heavy grips are applied on the same heads and shafts, the result will be lighter balance readings, but heavier gross weights. If both heavy heads and heavy grips are assembled on the same shafts, the results will be extra heavy gross weights but normal balance readings.

Center of Gravity Shifted

What really takes place when extra heavy grips are used without the head weights being increased, even on standard heavy weight clubs, is a shifting of the center of gravity towards the hands. This is referred to as high center of gravity and accounts for big name stars and others using light balance readings even though their clubs are noticeably heavier in gross weight than standard. Control is the important factor here which, of course, is another story.

Finally, we come to the effect of the fulcrum point B on special lengths. A 43-in. wood stepped up to 44-in. without changing either grip weight or gross weight, will cause the balance reading to change several points on the heavy side. This lowers the center of gravity and may result in head feel rather difficult to control. For that reason, the head weight is almost always reduced on extra long length clubs, while the grips are deliberately made heavier, with a view to producing playable clubs.

Making extra long length clubs with heavy balance readings is not difficult. Making the same clubs in the standard balance range poses no problem, but combining extra long lengths and smaller and lighter than regular grips is a different story, especially when light balance readings are specified on the Lorythmic scale.

The most difficult clubs of all to produce using this scale are the extra short length Irons with extra heavy balance readings in combination with extra large, heavy type grips. The No. 2 heads on D-6 Irons at standard length and with regular grips should weigh around 8 $\frac{7}{8}$ oz., which is on the heavy side. When the length is altered 1-in. on the short side of standard and the grips specified are the heavier all weather type, the head weights must be increased to between 9 $\frac{1}{4}$ and 9 $\frac{1}{2}$ ounces, if the same D-6 balance is to be maintained.

All this and more must be considered in talking head feel, center of gravity, balance point, swinging weight or any combination of these features.

Humor in Milwaukee



Humor was injected into the badges worn by contestants, officials and others at the recent Miller Open in Milwaukee with all the real and legendary activities of persons who help put over a big pro tournament worked in by Frank Marasco, Milwaukee Sentinel sports cartoonist, who conceived this unique treatment.

USGA Sets Tournament Dates for 1957

Joseph C. Dey, Jr., executive director, recently released the following schedule of USGA competitions for 1957:

International

Aug. 30-31 — Walker Cup, Minikahda Club, Minneapolis, Minn.

Championships

June 13-15 — Men's Open, Inverness, Toledo, O.

June 27-29 — Women's Open, Winged Foot GC, Mamaroneck, N. Y.

July 17-20 — Junior Amateur, Manor CC, Norbeck, Md.

July 29-Aug. 3 — Amateur Public Links, Hershey Park GC, Hershey, Pa.

Aug. 12-16 — Girls' Junior, Lakewood CC, Denver, Colo.

Aug. 19-24 — Women's Amateur, Del Paso CC, Sacramento, Calif.

Sept. 9-14 — Men's Amateur, Country Club, Brookline, Mass.

Sept. 30-Oct. 5 — Senior Amateur, Ridge-wood (N. J.) C. C.