

As the matter is important, it might be well to shew that addition of the solution of a sulphocyanate to one of a ferric salt, or of dilute sulphuric acid to lead acetate solution, although obviously leading to the formation of new substances, does not entail change of weight.

A HOME-MADE BALANCE¹

A balance with which to carry out the experiments described above may easily be made as follows, at a cost of less than a dollar; when carrying a kilogramme on each arm, one gramme additional is enough to move the pans through three inches.

In fig. 1. *i* shews the balance in perspective, *ii* is a view of the beam from above, *iii* is the stiffening piece, *iv* is a transverse section through the beam, column, and screws which serve as "knife edges" and *v* is a section through the beam near the end, to shew how the pans are supported.

The base is a piece of board 8x30 inches; the column is of wood 3 in. from front to back of *i*, one in. from right to left, and 18 in. high, screwed to the base and supported by two triangular pieces *E*. A notch $\frac{3}{8}$ in. deep $\times$ $1\frac{1}{2}$ in. is cut out of the top as shewn in *ii* and two small pieces of brass are screwed on at *D*. The beam is a lath *A* 25 in. long, $\frac{1}{4}$ thick and $1\frac{1}{2}$ wide, with a notch at each end $\frac{3}{8}$ in. wide and 1 in. long; it is stiffened by a vertical piece *B* of the same thickness, 23 in. long and 1 in. high in the centre, tapering to both ends, and fastened to *A* by screws. A transverse piece *C* of the shape shewn in *ii* and *iv* carries two screws *X* (flat head bright, 1 in. No. 6) whose points are filed sharp and rock on the brass plates *D*. Four more screws *Y* ($\frac{3}{4}$ in. No. 4), two at each end of the beam, carry small pieces of sheet brass *G* ($1\frac{1}{2}$ by $\frac{3}{8}$ in.) to each of which is soldered a wire loop; the pans, of galvanized iron $6\frac{1}{2}$ in. diameter, are hung from the loops by three strings each, so as to come about 3 in. above the base.

The points of the six screws *X*, *Y*, and the centre of gravity of the beam should be nearly in the same plane; the delicacy of the balance is increased by screwing down the two screws *X*, if they are too low, however, the beam will overbalance on either side and will not rise. The balance should be adjusted once for all, best when carrying bottle and counterbalance. A pointer with small adjustable weight may be added if desired.

A round piece of 4 lb. lead, turned up at the edge to form a saucer, makes a good counterbalance for the bottle used in the experiments of page 3; it should be made a little so light, and sand added to balance.

¹ The Central Electric and School Supply Co., 36 Adelaide St. W., Toronto, offers these balances at four dollars each.