ON A BALANCE FOR USE IN COURSES IN ELEMENTARY CHEMISTRY.

BY C. E. LINEBARGER.

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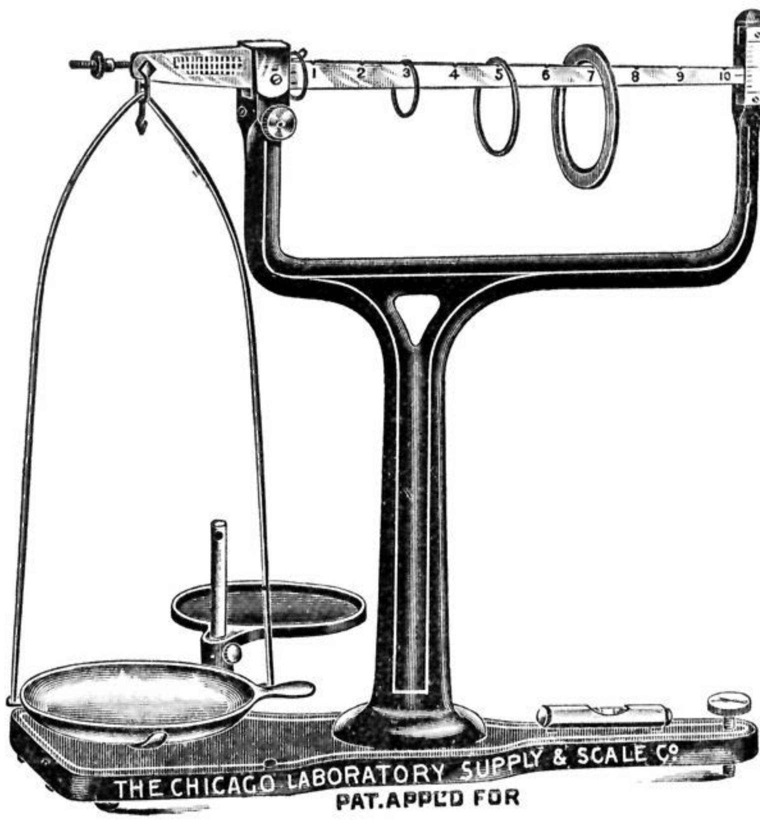
IT is now probably almost universally recognized that an elementary laboratory course in chemistry should include some experiments involving the use of the balance; that quantitative as well as qualitative work should be done by the student. Indeed, it seems that the fundamental laws of the science could not be really appreciated without some quantitative experiments being performed, Of course, such work cannot be done with expensive and delicate balances, as the beginning student has neither the time nor the requisite skill to handle them, not to speak of the cost. I think it will be admitted that a balance weighing to a centigram or so is all-sufficient. The balance should also weigh rapidly, and as generally the weighing is done at the desk where the student does the rest of his work, the balance should take up a minimum amount of room, and should allow a frequent removal from desk to desk without getting out of adjustmemt.

One of the most vexatious things about the use of a balance in elementary classes is the loss and deterioration of the weights. No matter how careful instructors and students may be, weights will get lost or will have acid spilled upon them; and their replacement is, to say the least, bothersome. A balance that is not subject to this evil and is at the same time rapid, compact, and sufficiently accurate is shown in the accompanying cut.

As is seen, it has unequal arms, their ratio being as four is to one. The longer arm twenty cm. is divided into 100 equal parts, notches being made at the points of division. The weights consists of three riders weighing 25, 2.5, and 0.25 gram, respectively; in weighing, the positions they occupy when equilibrium is attained, show at a glance the desired weight. Thus, the reading in the cut is 7.53 grams. The riders are given a ring-shape so that they form an integral part of the balance; they are thus secured against loss. When any of them are not needed, they may be placed on a horizontal arm above the beam and are thus out of the way; their sizes are such that they slip easily through one another. The capacity of the balance is 111.0 grams; it is sensible to 0.005 gram with no load, and to about 0.01 gram with an average load. The up and down motion of the pan is so slight and the lateral motion of the beam so limited by stops that but little damage



can be done to the steel knife edges, even though a careless student might perchance throw the object to be weighed upon the pan. Not only is the room taken by the balance itself small, but the room that would be occupied by weights is entirely spared. To prevent corrosion as much as possible, most of the parts are lacquered in black with white and gold lettering; not only is this finish durable, but it also prevents, in a measure, the balance appearing old from usage.

The balance is made by the Chicago Laboratory Supply and Scale Company, 31-45 West Randolph Street, and will be known as the "Chaslyn Balance."

THE DETERMINATION OF POTASH AS PERCHLORATE.

BY F. S. SHIVER.

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THE increasing use of potash salts for fertilizing purposes has made the determination of potash a question of prime importance to the agricultural chemist.

The desire to devise a method at the same time rapid and accurate has been manifested in many ways in the past few years, especially in Germany, the seat of the great potash deposits.

The German chemists believe they have solved the problem in the so-called Stassfurt method, which as all know permits of the separation of the potash by platinum chloride after previous precipitation of sulphuric acid by barium chloride in slight excess, and in a strongly acid solution. This method with practice is quite accurate and rapid, with a slight tendency, however, to high results in my hands. It possesses little advantage over the Lindo-Gladding method, in so far as rapidity and accuracy are concerned.

The following determinations were made by the Stassfurt method—potassium sulphate, C. P., and potassium chloride, C. P., were mixed with such impurities as to imitate the composition of commercial sulphate of potash, sulphate of potash and magnesia, kainit, and muriate.

TABLE I.

	K_2SO_4 used. Gram.	K_2SO_4 found. Gram.	Error on K_2SO_4. Gram.	Error on K_2O. Gram.
Sulphate of potash	0.3284	0.3291	+0.0007	+0.0004
		0.3289	+0.0005	+0.0003
Sulphate of potash and magnesia	0.1856	0.1863	+0.0007	+0.0004
		0.1870	+0.0014	+0.0008
Kainit	0.1000	0.1003	+0.0003	+0.0002
		0.1009	+0.0009	+0.0005
	KCl used. Gram.	KCl found. Gram.	Error on KCl. Gram.	Error on K_2O. Gram.
Muriate	0.2506	0.2498	—0.0008	—0.0005
	0.2522	0.2514	—0.0008	—0.0005

The factor used for converting potassium platinichloride into potassium sulphate was 0.35694 which is practically the same