and the cocks E again opened, taking care to have the ground glass cocks F closed.

During distillation the steam is controlled by the stop-cocks F, and the operation is further regulated by the use of Bunsen burners under the distilling flasks. One person can easily attend to six or more distillations at one time.

Experience of more than a year has proved the utility of this arrangement, where many samples involving analysis by distillation, have been presented in a day.

A NEW MUFFLE FOR INCINERATION OF SUGAR.[1]

By H. Schweitzer and E. Lungwitz.

THE incineration of sugar for the determination of ash is generally carried out in platinum dishes which are placed in a muffle of platinum (Scheibler) or of Russian sheet iron (F. G. Wiechmann) kept at a dull red heat. The platinum muffles to hold two dishes, weigh from sixty to seventy-five grams, and are very expensive apparatus. Moreover it happens very often that in a platinum muffle the last portions of carbon are oxidized with difficulty. Frequently a little higher temperature under the muffle of platinum which is such an extremely good conductor of heat, causes the ash to fuse and the melted salts, including unburnt carbon, form black blotches in the dish. On account of the insufficient draught in the platinum muffle it is then very difficult to accomplish perfect incineration. In such a case, as Tucker says in his manual of sugar analysis, the dish is allowed to cool, one or two drops of sulphuric acid added, and the dish heated cautiously at first to avoid spattering and finally brought to redness for fifteen minutes. Naturally such proceeding causes delay and does not contribute to the exactness of the determination.

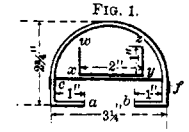
The muffles of iron are impracticable for quick commercial work because the incineration in them takes much longer time than in those of platinum.

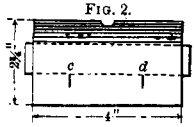
These considerations prompted us to devise an apparatus, better fitted for the incineration of sugar than the muffles mentioned above.

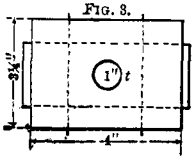
[1] Read December 8, 1893.

The accompanying cuts show how we solved this problem.

A French clay muffle is cut open at the bottom; (see Fig. 1, *a*, *b*) through the walls of the muffle at both ends holes are bored (Fig. 2, *c*, *d*) throughw hich platinum wires are fastened in the manner shown in Fig. 1, *e*, *f*. These wires serve as support for the bent platinum sheet, (Fig. 1, *w*, *x*, *y*, *z*) on which the dishes containing the sugar are placed. In the center of the top of the muffle a round hole is cut out, (Fig. 3, *t*). The bent sheet *w*, *x*, *y*, *z*, can also be made of Russian sheet iron. The muffle is placed on a tripod and heated as usual.







This construction produces a good draught in the muffle and allows the use of the largest flame of the so-called "Acme" burner which accelerates the incineration very considerably. Whereas the complete incineration under normal conditions in a platinum muffle lasts from about forty to forty-five minutes, it lasts only twenty-five to thirty minutes in our platinum clay muffle and about forty-five minutes in our platinum iron muffle. The short time in which our platinum clay muffle works, naturally reduces the expense for gas. For about one year we have had both kinds of clay muffles in constant use and always obtain light and flaky ash and never a fused ash.

We feel assured that these new muffles, saving time and money, will be welcome additions to the outfit of every sugar laboratory.

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