

battery (modified Leclanché) for ordinary electrotherapeutic applications, and I use a modification of the McIntosh battery for electrolytic purposes.

About five years ago I introduced certain improvements in the construction of the McIntosh battery, which improvements have since been adopted by the manufacturers, and which, in my estimation, make it the model plunge battery. It is simple, convenient, and does not readily get out of order. The horizontal plate to which the elements are attached is padded on the under side to form a hydrostat plate (11, Fig. 2,) one-half of which is used to cover the cells (13), when the battery is not in action, while the elements (12), attached to the remaining half, are suspended in a drip-cup (14) by the side of said acid cells. The hydrostat-plate is pressed down upon the cells, keeping them water-tight by means of bearings or springs attached to the lid of the case when the latter is closed.

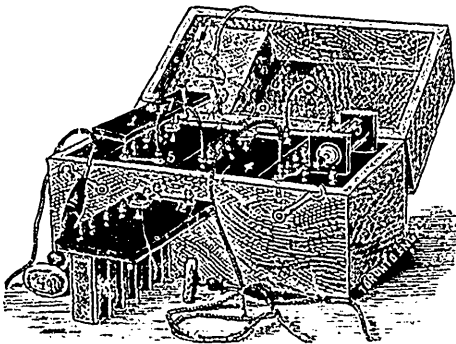


Fig. 3. The elements immersed. 6, 7. Adjustable connections between 1st and 2nd and between 2nd and 3rd series of plates.

Thus when the box is closed and locked the acid cells are automatically sealed, and when the box is open the battery is ready for use. The battery-case is elongated to the right to the extent of half the width of a hydrostat plate, so as to provide a space for overlapping to that extent. When the elements of the first series (1 to 6) are immersed, space is left for the overlapping of the plate of the second series, which, in turn, makes way for the third, and so on. The connection between the last element of one series with the first element of the next is made by means of an adjustable spring or rod. Hence by these modifications the elements may be displaced to the right and back again to the left without loss of time and without being rotated, which was impossible with the origi-

nal McIntosh battery, and, moreover, any one of the zinc or carbon plates may be easily removed, repaired or replaced without the help of an electrician. To sum up, this battery has the following advantages: It is cleanly, simple in construction, simple in management, and saves time. For electrolysis every cell of the battery should have an internal resistance of not more than one ohm. A battery cell having an internal resistance of less than one ohm will operate the vibrator in the primary circuit of a faradic coil, and this constitutes a very good test for the efficiency of battery cells when required for electrolytic purposes. The internal resistance of the single cells of the McIntosh battery with a freshly prepared battery-fluid, (chromic acid or bichromate of potash and sulphuric acid), is about one-half an ohm, and the cell will keep the automatic interrupter of the faradic coil vibrating for several hours before it becomes polarized, whereas a Leclanché cell will become polarized in less than ten minutes.

The internal resistance of the portable chloride of silver and the portable chloride of ammonium cells is as high as 8 or 10 ohms. This high resistance renders them inadmissible for the electrolysis of uterine or other fibroid tumors.

2. *The Milli-Ampère Meter.*—This modification of the galvanometer was described in MEDICAL SCIENCE for December. By the deflection of the needle the presence of the current is detected, its direction indicated and its strength measured. The attempt to estimate the strength of the current by the number of cells in circuit would only lead to deception. Apostoli says that the galvanometer can no more be dispensed with in uterine electrol-

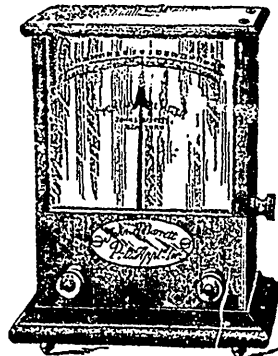


Fig. 4. The Barritt or "Elektron" Milliampere-Meter.

ysis than can the scales be dispensed with in chemistry or pharmacy. The horizontal milliampère