

**STORAGE BATTERIES, THE
CHEMISTRY
AND PHYSICS OF
THE LEAD ACCUMULATOR**

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Storage batteries, the chemistry and physics of the lead accumulator by Harry W. Morse

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HARRY W. MORSE

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STORAGE BATTERIES



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STORAGE BATTERIES

THE CHEMISTRY AND PHYSICS OF THE
LEAD ACCUMULATOR

BY

HARRY W. MORSE, PH.D.

ASSISTANT PROFESSOR OF PHYSICS
IN HARVARD UNIVERSITY

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STORAGE BATTERIES

CHAPTER I

INTRODUCTORY AND HISTORICAL

1. Into our present age of power, where we reckon by thousands and tens of thousands of kilowatts, there has come down from a previous era one single form of the galvanic cell which retains sufficient commercial importance to be worth consideration in connection with modern power plants and modern power operation. This is the lead-sulphuric acid accumulator. It was invented and perfected in the heyday of galvanic cells — at a time before the dynamo and the electric motor had any technical importance. In our own laboratory, hidden away in the attic where cast-off things are stored, lie the remains of the big Bunsen cells which were once the source of our heaviest currents and with which the remarkable phenomena of current electricity were shown to classes and in public lectures in those days. These same cells were used to charge small storage cells of the original Planté type — mere strips

of lead, separated by soft rubber insulators and rolled into spiral form; then formed with the aid of the primary cells, by a series of reversals, until the plates attained a certain capacity. One of these cells is shown in Figure 1. With these storage cells, which have low resistance and high current-giving capacity even in comparison with the large Bunsen cells, the



FIG. 1. — Original type of Planté accumulator. (About $\frac{1}{2}$ full size.)

most wonderful experiments could be performed — experiments which are to us now so commonplace and so much a part of our everyday life that their description brings a smile from the high-school boy who has studied physics and chemistry. These cells would run an arc light for several minutes; heat small platinum wires to the melting point; provide current for electromagnets of power enormous for that

time. It was the duty of the laboratory assistants to set up the battery of Bunsen cells. Huge zincs in dilute sulphuric acid and great blocks of carbon were arranged in glass jars with porous cups, and from this fuming source the storage cells were charged all day, to be used the day following in demonstrations of the power of the electric current. After the charge was finished the big Bunsens were taken apart and cleaned up, then stored away until