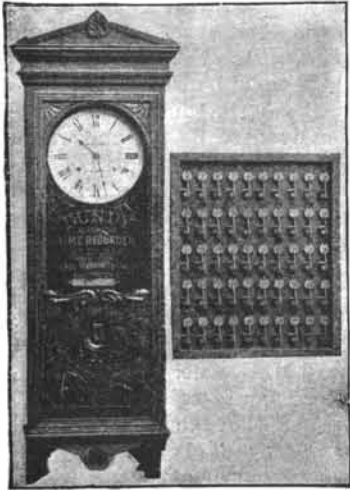


THE BUNDY AUTOMATIC TIME RECORDER AT THE EXPOSITION.

The exhibit made by the Bundy Manufacturing Co., of Binghamton, N. Y., at the Columbian Exposition, was a striking one, as is evidenced by our illustration, and the time recorder furnished by this company was the only one receiving an award, a medal and diploma being awarded it. The Bundy system was also used exclusively during the construction of the Exposition buildings, and during the continuance of the Fair, for recording the time of mechanics, clerks, laborers, etc., including all employes except the Columbian guards, who were under military discipline. For this purpose about thirty-five recorders were employed in various locations upon the grounds, besides others in different "model" establishments, as the model paper mill,



THE BUNDY TIME RECORDER.

model laundry, the Libby glass works, the Shoe and Leather building, etc. Our readers will remember that we have heretofore published a description of this improved time recorder, which is designed for use in factories, shops, stores, offices, or wherever the time of employes is required to be noted and a record kept thereof. It operates in connection with a standard clock, and the recording mechanism is arranged in a suitable casing within the clock case, below the dial, there being a central opening in front for the admission of a registering key. The clockworks are of the best variety, the Seth Thomas 100 beat pendulum movement, and the ink ribbon is in the casing with the mechanism, the reel of paper on which the record is made being just below. At one side of the clock, as shown in the small view, is an open case or keyboard fixed against the wall, in which are hung numbered keys. Each workman or employe whose time is to be taken is given a number, and in going to or departing from work he takes his key from the keyboard, inserts it in the keyhole of the recorder, turns it one quarter around, and then removes and hangs it up again. He thus records upon the paper ribbon within the machine the number of his key and the exact hour and minute of his arrival or departure. In going out he also holds down a lever projecting through the clock case on the left hand side, and a star is then printed in front of the hour record on the paper strip. The latter can be readily removed, as often as desired, for filing away, and forms a perfect and indisputable record of the workman's time. A bell rings as each record is made, thus preventing one from registering for another without detection, and after the key is inserted it cannot be taken out until it registers, neither can a second registry be made without removing the key.

At the present time, as we are informed, there are over 2,500 of these time recorders in use in various manufacturing and other industries throughout the country, where they are giving great satisfaction and paying their original cost several times over each year.

Postal Service in Interior Africa.

A five cent stamp will take one of our mammoth Sunday newspapers from this country to the white stations on the far Upper Congo. The probability is that the actual cost of delivering one of these newspapers at Stanley Falls, for instance, is twice or three times the amount of postage charged.

It is carried over the ocean about 7,000 miles before it enters Africa. It is transhipped three times before; at Matadi, ninety miles from the sea, it is placed on the

back of the mail carrier who is to transport it 235 miles around the cataracts of the Lower Congo before it is placed on one of the steamers of the upper river, and the carriage becomes reasonably cheap again. Every pound of mail that goes to the Upper Congo is incased in waterproof wrappers, and for more than two weeks it is carried up hill and down, under the scorching sun and through the tropical rains, on the backs of porters; and when it finally reaches Stanley Pool the mail is sorted for shipment by one or another of the little steamboats that drop the mail packages at the government stations or the commercial posts as they thread their way among the islands for a thousand miles up the main river, for 800 miles up the Kassai and Sankuru tributaries of the south, or for 500 miles up the Mobangi affluent of the north.

All these Upper Congo stations, some seventy-five in number, isolated as they are from the rest of the world, have most of the conveniences of the modern postal service. When white men among the cannibals and the dwarfs write to their friends at home, they have the neat postage stamps of the Congo Free State to affix to the envelopes. If they wish to send money home they may procure money orders at any of the stations of the State, where, also, the orders they receive from abroad are cashed.

The only respect in which the service is deficient is that the mails are irregular, for the white pioneers often wait days and even weeks for the arrival of the mail steamer which is not only to bring them tidings from home but also the stores which they need in carrying on their work.—Pittsburg Dispatch.

African Ants.

Dr. Sharp gives the following extract from Dr. Livingstone's "Narrative of an Expedition to the Zambesi." "We tried to sleep one rainy night in a native hut, but could not because of attacks by the fighting battalions of a very small species of *Formica*, not more than one-sixteenth of an inch in length. It soon became obvious that they were under regular discipline, and even attempting to carry out the skillful plans and stratagem of some eminent leader. Our hands and necks were the first objects of attack. Large bodies of these little pests were massed in silence round the point to be assaulted. We could hear the sharp, shrill word of command two or three times repeated, though until then we had not believed in the vocal power of an ant; the instant after we felt the storming hosts overhead and neck."

A NEW STORAGE BATTERY

It seems to be a well established fact that the efficiency of electric lighting stations can be greatly increased by the addition of a suitable storage battery plant, which will utilize the surplus energy of the engines, so that they can be run continuously at their maximum load, consequently securing the greatest economy. In Europe, the practice of using storage batteries during the day which are charged by the dynamos the latter part of the night is becoming common. To some extent the same thing has been done in this country. In Paris, the Popp Company, operating twenty-five sub-stations, employs a storage battery at each station having a capacity of from two to three

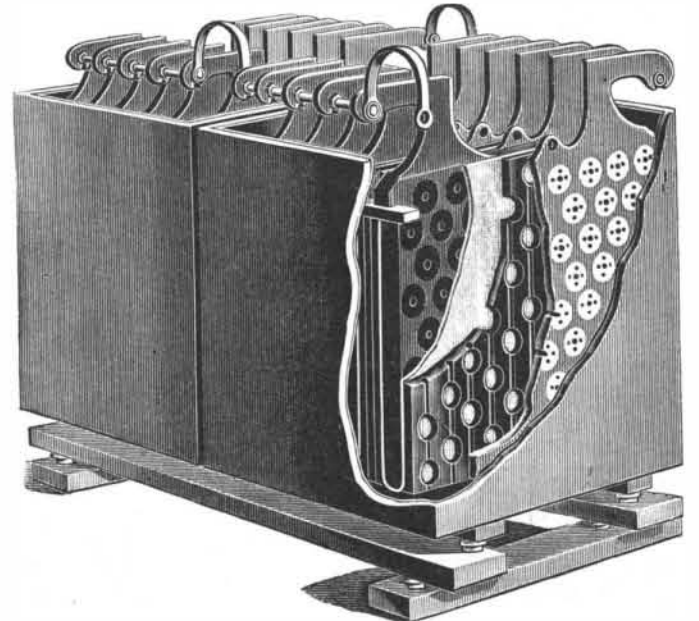
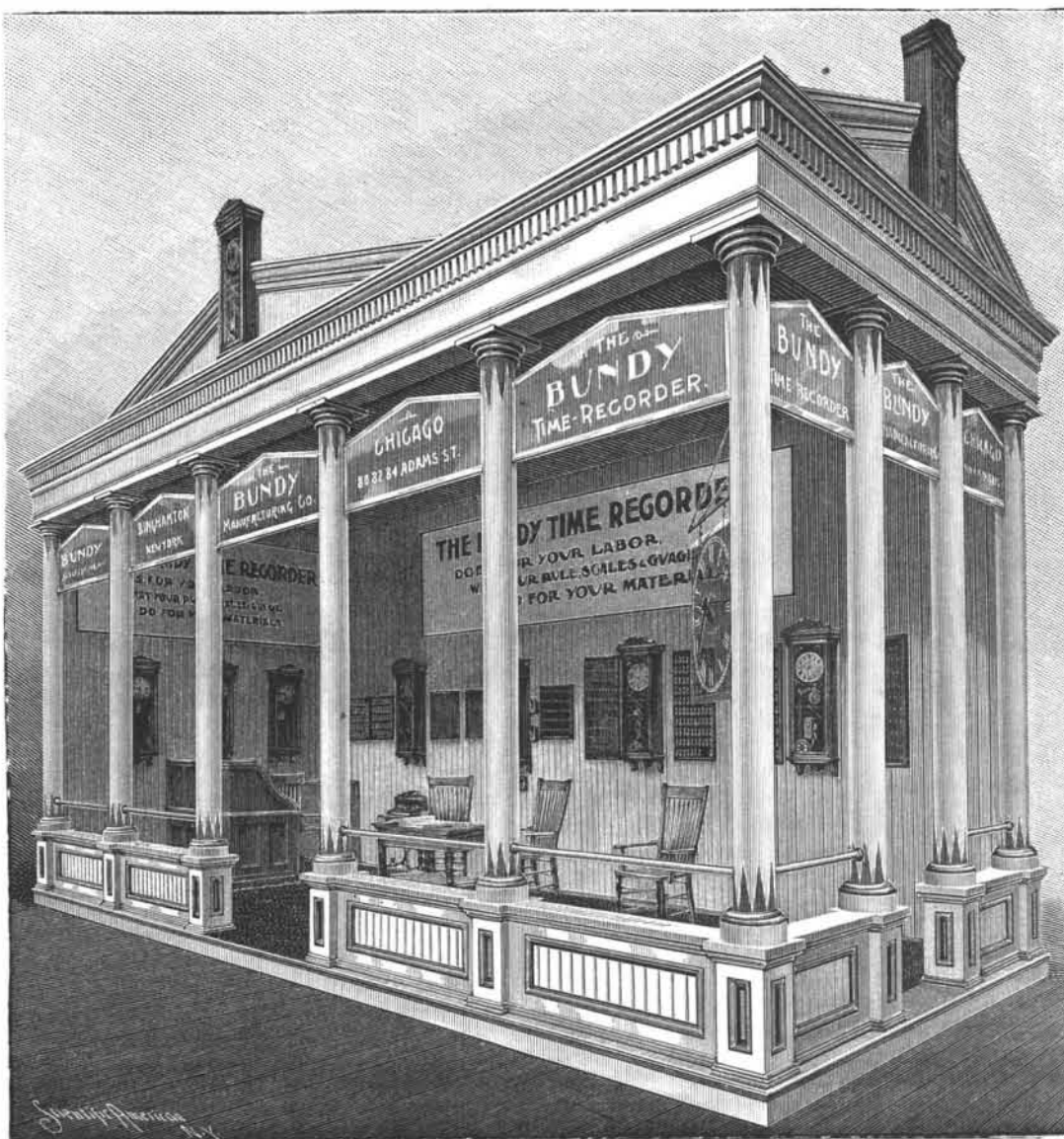


Fig. 1.—NEW STORAGE BATTERY.

thousand ampere hours, and feeding over 100,000 lamps. In Germany and England the same thing is seen; in Hanover 20,000 lamps are operated by storage batteries: Dusseldorf, 20,000; Bamberg, 2,700; Darmstadt, 5,800; Hamburg, 12,000; Elberfeld, 14,000, and so on. These sub-stations are all supplied with the chloride type of storage battery, similar to that which we here illustrate.

The Electric Storage Battery Company, of Philadelphia, is introducing in this country the chloride accumulator, and have established works at Gloucester, N. J. The elements of the chloride battery are made of tablets cast from fused chloride of lead and zinc, which are held together by a frame or rim of antimonious lead. The tablets which compose the plates are subsequently converted into active material of perfect character by electrical action. The crystals which are formed in this manner are needle-shaped, running through the plate perpendicular to the surface. By the elimination of the chlorine, innumerable minute cells are formed around these crystals, giving an enormously extended surface, which is essential for the great capacity. This material is entirely different in character from the ordinary active material which is mechanically applied, and it has proved itself to be much more durable, uniform, and efficient.

Fig. 1 is a perspective view of a pair of accumulator cells, with parts broken away to show the interior, and Fig. 2 is a side view of the accumulator plates. The reduction of these plates requires from 12 to 24 hours. Every trace of chlorine is finally removed by washing the plates in running water, after which they are charged continuously for several weeks, until the crystalline spongy lead has been completely converted into peroxide. The negative plate of the battery is separated from the positive plate by a separator, S, made of wood soaked in insulating compound and perforated and grooved longitudinally to permit of the free circulation of the electrolyte. The positive plate is made considerably heavier than the negative plate, and is surrounded by asbestos



THE WORLD'S COLUMBIAN EXPOSITION—EXHIBIT OF THE BUNDY TIME RECORDER.