

dynamometer, which in turn was connected by a belt with the dynamo under examination. At a convenient distance from the dynamo were located the lamps and resistances (resistance coils), through which the current furnished by the former was allowed to flow, as well as the various instruments employed in the electrical measurements. Steam for the engine was furnished by a set of boilers located near by, but in a separate building.

"The source of motive power was, as stated before, an Armington & Sims engine, rated, nominally, at about seventy horse-power when supplied with steam at about eighty pounds pressure. The normal speed of the engine was about 275 revolutions per minute, but this could be varied within limits of a considerable range, without any serious interference with the action of the governor.

"For measuring the power supplied to the dynamo, there was employed a dynamometer originally designed by W. P. Tatham of Philadelphia. This instrument was the same as that used some years ago by the committee appointed by the Franklin Institute of Philadelphia to conduct the competitive tests of dynamos exhibited at the Electrical Exhibition held in Philadelphia in 1885. A description of the apparatus will be found in the *Journal of the Franklin Institute*, November, 1885.

"For measuring the current furnished by the machine, there were employed two methods, the full-load current being 400 amperes, — too great for any single instrument in our possession, — a part of this was measured by a Thomson balance, and part by observing the potential difference between the ends of several heavy strips of German silver immersed in oil. The latter method is known generally as the method of fixed resistances, and the apparatus referred to was standardized by observing the difference of potential at its terminals, when a current of known value, as measured by the Thomson balance, was allowed to pass through it.

"In the measurement of electromotive force there was used a Weston voltmeter, received only a few days previously from the laboratory of Mr. Edward Weston, where it had been standardized. This, however, as well as the other measuring apparatus, was, after the completion of the test, carefully calibrated in the physical laboratory of this university.

"It may be stated that owing to the construction of the measuring apparatus employed, and also to the circumstances that a considerable distance separated the instruments used from the dynamo, no magnetic influence could have interfered with the accuracy of their indications. Before measuring the power absorbed by the dynamo, the dynamometer was run without load, in order to determine its own friction. This amount of power consumed was, in all cases, subtracted from subsequent measurements. The friction of the dynamo itself was determined by running it on open circuit, and with the brushes removed.

"The order of making the tests was as follows: first, the dynamometer was run without load; second, the dynamo was run on open circuit, brushes removed (this measurement gives friction of dynamo); third, the dynamo brushes were placed in position (this measurement represents losses due to friction in bearings, losses due to heating of field magnet wires, losses due to reversals of magnetism of armatures, core, and losses due to Foucault currents in the armature). These losses are, for a given speed, nearly constant. After this, the dynamo circuit was made, and measurements of power, current, and electro-motive force at different loads were begun. The following table gives the results of the several determinations.

Current.	Electro-motive force.	Horse Power.	Dynamometer Horse Power.	Loss.	Losses, Friction, Reversals, etc.	Losses Current ² × Resistance.	Efficiency.
134.8	114.0	20.6	24.97	4.4	4.4	.17	82.5
194.1	115.6	30.1	35.3	5.2	4.5	.38	85.2
371.6	98.3	49.0	54.5	5.5	3.5	1.30	89.9
400.0	110.0	58.9	64.7	5.8	4.1	1.50	91.0

"Speed of dynamo, 330 revolutions per minute."

A NEW USE FOR THE PHONOGRAPH.

At a meeting of the Massachusetts Medical Society on Nov. 20, A. N. Blodgett, M.D., made some interesting remarks on the use of the graphophone or phonograph in taking and recording the clinical history of a patient. As reported in the *Boston Medical and Surgical Journal*, Dr. Blodgett spoke as follows:—

"Some time ago my attention was called to this instrument, about which I had known something, although not in its present state of perfection. It occurred to me that this might be of interest to physicians in various ways, and particularly to those connected with public institutions. As you have seen, by speaking into the mouth-piece a record can be produced upon the yielding cylinder of wax, which will remain permanent, and can be reproduced a great many times.

"Last night Mr. Thomas and I made experiments at the City Hospital on a patient just admitted to the accident room. His clinical history was taken; but it was not in all respects a success, because he had an injury preventing his speaking with much force, it being a fracture of the ribs. But we got a record from an actual patient in an actual examination which was reproducible and could be understood. Later we got another record from a hypothetical patient; namely, one of the house-officers of the hospital, who was questioned in the same way as would be an ordinary patient admitted under circumstances which precluded any previous knowledge of him or his condition. That record was more distinct, could be very well understood, and I am sure any one with a little practice could use this machine in a way to obtain durable and trustworthy records from the lips of the patient.

"An instrument of this kind might be made portable, and a visiting physician in a hospital might give his directions into the funnel, when they would be recorded upon a small cylinder, which can be put upon another machine, and the physician's directions as to treatment or his description of lesions can thus be accurately recorded. This record is got by means of the graphophone, which is used a great deal in conjunction with the typewriter. I know how difficult it is to get full directions in the wards from the visiting physician, and here we have the means of an absolute record. In medico-legal cases I think it would be of great service because the utterances of the patient could be reproduced at an indefinite period afterward, and I should suppose would be evidence in the case."

HEALTH MATTERS.

Hallucinations in Alcoholism.

DR. F. W. MANN, in a paper upon alcoholic hallucination read before the Detroit Medical and Library Association, brings together some facts and theories which are published in the *Physician and Surgeon*, November, 1889:—

"The visual hallucinations of alcoholics are exceedingly varied. They may be hideous, grotesque, or awful, or they may be gorgeous, splendid, or inspiring. Unpleasant features usually predominate, and the patient is puzzled and tormented by the presence of rats, mice, beetles, worms, fleas, and other insects. This condition of zoöscopic hallucination is one of the commonest among the phenomena of alcohol poisoning.

"I do not recall having seen any explanation of the reason why animals enter so largely into the composition of the primary illusions of alcohol. These illusions a little interrogation of the patient will usually substantiate as present. A patient only the other day declared how he saw a rhinoceros, several huge elephants, and strange-looking reptiles browsing in the yard.

"A word should be said on the snake hallucination. Disorders of this kind are associated in the popular imagination with excesses in the use of alcohol. 'Seeing snakes' is in reality not a common experience. The two or three cases we have seen convince us, however, there is some basis for esteeming this one of the occasional retributions of excessive zeal in devotion to Bacchus.

"The snake hallucination is difficult to explain. Disturbances in the peripheral organs of vision seem hardly competent to account for such aggravated symptoms, although there are facts suggesting the plausibility of such an explanation. A patient in a