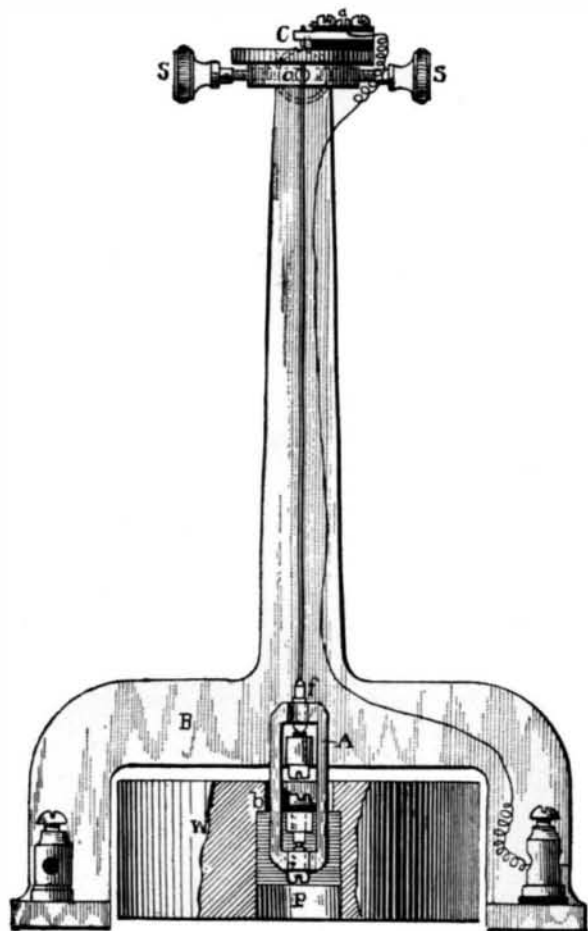


THE MARVIN SEISMOGRAPH.

BY EMMA V. TRIEPEL.

Resting upon a square stone firmly embedded in the floor beneath the southwest corner of the main building of the Weather Bureau's headquarters at Washington, D. C., is a seismograph, the only instrument in the United States by which the time and duration of earthquakes can be recorded.

This machine may be described thus: A heavy lead



THE MARVIN SEISMOGRAPH.

weight, W, is pivoted to a short steel link, A, by means of a screw, b, the sharp point of which is just above the center of gravity of the weight, so that the latter will balance and remain stable on the pointed support. The top of the link hangs from a small projection from the frame of the instrument, B, being held in place by a second sharp pointed screw. A slender flexible needle, f, about six inches long extends straight upward from the topmost edge of the link, and its platinum tipped point normally passes exactly through the center of a platinum rimmed hole in an insulated metallic plate which is held stationary with the frame of the instrument.

One pole of an electric circuit connects with the needle at the pivot, and the opposite pole is fastened to the metallic plate. A seismic shock causes the needle tip to strike the platinum rim of the above mentioned hole, thus completing the circuit and being transmitted to the recording instrument in another building.

This register is a revolving cylinder which moves by clockwork and makes one revolution every six hours. A broad band of paper cross ruled with heavy hour lines, between which the space is subdivided by finer five minute lines, passes around the cylinder. Pressing against the moving paper ribbon is a small arm, tipped with a fountain pen, which is so controlled by the clock as to make a spiral line upon the recording sheet for seven days, without changing. The clock, which keeps standard time, is connected with the arm in such a manner that the pen is made to move every hour, thus making points in the otherwise even line. An electromagnet on the base of the register, which is connected with the pen arm, is connected electrically with the seismograph; when, therefore, the circuit is closed by the needle being jarred from its normal position so as to touch the platinum rim, the vibration is indicated by offsets, in the spiral line, between those regularly made.

The time of such disturbance is ascertained by counting the hours since the revolution began, as indicated by the points regularly made, then the five minute lines exceeding the last hour point, and then applying a delicately graduated scale for the seconds and fractions thereof. Finally, any error in the clock which drives the cylinder is determined by comparison with a pendulum clock which is regulated by telegraphic signals from the Naval Observatory. The duration is indicated by the number of successive

lateral strokes made in the tracing by the fountain pen.

This seismograph was invented by Prof. C. F. Marvin, and has registered six earthquakes during its four years' service, that of May 31 being most pronounced. It is so situated that only a tremor of the earth itself can affect it, but although its utility for recording the time and duration of seismic shocks has been fully demonstrated, it does not indicate their direction, being in that respect inferior to many instruments now in use in Japan.

Scientists are anxious to have accurate seismographs placed in all the observatories throughout the country, believing that with a network of such apparatus, carefully installed, such phenomena could be observed upon a broader scale than ever before within the world's history.

A HORSELESS BROUGHAM.

In the SCIENTIFIC AMERICAN for March 13, 1897, we illustrated the hansom cab of the Electric Carriage and Wagon Company, of Philadelphia and New York; we now show the Morris & Salom brougham. It is just about to be put in operation in New York City. The hansom cabs in New York are giving great satisfaction and are in constant use, and it is expected that the brougham will be as popular as the hansom.

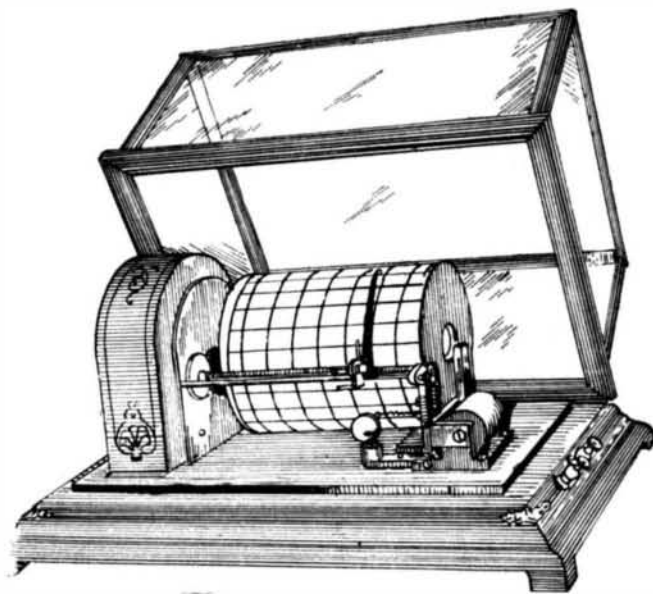
It embodies many features considered of great importance, the principal one being what is known as the "Tracteur" principle, and consists in mounting the motors, gears and batteries on the front truck or axle, thus maintaining back of the battery line all of the features of standard carriage construction, the body part of the brougham being built on precisely the same line as those intended to be drawn by horses. It is evident that this principle adapts itself to the construction of all sorts of carriages, such as landaus, victorias, cabriolets, opera coaches, etc. The new brougham is provided with 2 horse power Londell motors and a battery of 44 3 F. elements of the Electric Storage Battery Company. The motors are wound for 900 revolutions per minute and gear directly with a single reduction to the internal gears on the 36 inch driving wheels. As the motors are independent, the differential action in turning is obtained without the necessity of countershaft with balance gears. Motors are mounted on the axle and swing radially about the same; and are supported on the opposite side by spiral springs attached to the body.

The accumulators have a capacity of 100 ampere hours each, making the total battery capacity about 12 horse power hours, which is amply sufficient, owing to a very high efficiency of the motors and the means of the transmission of power, to drive the vehicles fully twenty-five miles under ordinary street conditions. On asphalt pavements and small gradients thirty-six miles have been run without recharging. The average speed is six miles per hour. The wheels are of the wire suspension type, fitted with brass hubs and ball bearings and pneumatic tires of three inch section. The steering is accomplished by moving the rear wheels in parallel planes by means of a lever placed on the right hand of the driver. The controller is placed under the

driver's seat and is operated by a small lever with the left hand, it being arranged so as to permit of three speeds ahead and one back. The carriage is elegantly finished and has luxurious fittings, and weighs very little more than the horseless hansom cab.

Superstition of a Well-Known Writer.

There are many persons who have a superstition regarding figures, and who believe in their influence, good or bad, upon the events, important or unimportant, of their existence. The eminent writer, M. Emile Zola, is numbered among such. Quite recently, while he was going down Rue de la Chaussee d'Antin, at Paris, he was knocked down by a hack, which passed over his legs, without, fortunately, doing any other



SEISMOGRAPH RECORDER.

damage than bruising him. M. Zola has a superstitious horror of the number 17. This number is to him unlucky. After he arose, he looked at the number of the hack, added up the figures in a flash, and found the total to be 17. The great writer had, for a long time, held the belief that the number 17 had a malign influence upon him, and that aggravated the case.

Dr. Toulouse has recently devoted a volume to a study of M. Zola, in which he character, temperament, and the very sources of the illustrious writer's talents are analyzed with all the resources of psychology and physiology. On pages 251 and 252 of this book, the author says:

"Thus, certain figures have a bad influence upon M. Zola. If the number of a hack, when added up, forms this figure, he will not engage the vehicle, or, if he is obliged to do so, will fear that some misfortune may happen to him. For example, that he may not succeed in the business that he has started out to do. Such superstitious idea may supervene apropos of any of his arithmomanical impulses. For a long time the multiples of 3 appeared favorable to him; but now it is the multiples of 7 that reassure him. Thus, in the night, it often happens that he will open his eyes seven times in order to prove to himself that he is not going to die. On the contrary, the number 17, which recalls to him a sorrowful date, seems to him to be unlucky, and chance has ordained that he should recognize a coincidence of certain unfortunate occurrences with that date. Similar superstitious ideas exhibit themselves outside of all arithmomania. Thus, he will perform certain acts with the idea that, if he does not do so, some annoyance will happen to him. So he will touch the gas burners that he meets with in the streets, surmount an obstacle with the right foot, walk upon the pavement in a certain way, etc. For a long time he feared that he would not succeed in the proceeding that he was going to undertake unless he started out of the house with his left foot foremost." — La Vie Scientifique.



A HORSELESS BROUGHAM.

THE American X Ray Journal is a monthly journal devoted to practical X ray work and allied arts and sciences. The June issue contains a number of interesting radiographs, but we regret to notice a newspaper story about an English lady who lost her diamond ring in the dough of a cake. She did not discover the loss until the baking was complete, and rather than sacrifice her production or run the risks of having her guests swallow her ring, she sent the cake to an X ray studio, the ring being located by the shadowgraph without spoiling the form of the cake, and the extraction was readily accomplished. This very improbable story undoubtedly originated in the brain of some reporter.