THE NEW YORK FIRE ALARM TELEGRAPH.

A visitor to the central office in Mercer street is surprised at the amount of delicate and costly machinery which is crowded into the small room devoted to the use of the telegraph. Three sides of the apartment are completely filled with the apparatus—some of it so intricate that it must be kept covered with glass, to exclude the least dust or grit, which would at once interfere with its movements. At the end of the room facing the entrance may be seen the wires, which center here from all parts of the city to the number of nearly two hundred, each with its little brass key with which it is thrown "into circuit." To the right of this frame of wires stands a large "annunciator," similar to that used in hotels; this is surmounted by a Morse magnet and a small gong. Below and in front of the annunciator is a printing machine, and on each side of this a "dial machine" and pointer, similar to those used in the station houses. On the opposite side of the room a very beautiful piece of mechanism stands on a table, covered with glass and always ready for use. At the first glance, one would say it was a rather complicated musical box or a small barrel organ; for it has six drums with the stops and steel combs, and its operation is somewhat similar. To this instrument is entrusted the work of conveying an alarm to every engine house from the Battery to Harlem, which it does with "neatness and dispatch."

To illustrate, let us suppose that an alarm is struck on the gong. The number rung is 256; instantly the annunciator uncovers this number, and the printing machine writes it down three times and the gong repeats it twice. The wires are thrown at once into "circuit" by an operator, while another places a brass button bearing the same number on the spindle of the machine in the glass case, touches a spring, and off starts the automaton operator, striking 2—5—6 on every fire-gong in the city, making a pause of five seconds, and then repeating the 2—5—6, and yet again repeating the numbers after a similar pause. While this is going on, the same operator throws the wires to the bell towers into circuit, and the alarm is thrice sent to them; and, in less time than it takes to read the description, the bells are heard, and if the fire is near the office, the engines rattle by.

The next step is to make a record of what apparatus is at the fire, which is done by pulling out, from their receptacles in a neat frame, cards bearing the numbers of the engines and trucks which respond to a first alarm. This is scarcely done before 3—3—3 is rung on the gong. This is a private signal, sent from some box by a fireman, policeman, or perhaps one of the commissioners who has not heard the alarm distinctly, and wants to know where the fire is. The number of the box whence the alarm came (2—5—6) is at once sent to the box designated by the annunciator, where it is rung on a little bell. Occasionally this inquiry comes from half a dozen boxes.

By this time, the bells in the office have ceased their tinkling, the automaton has given its alarm, the record of engines out is made, and the operators sit down to compare notes as to what buildings are in the neighborhood of the box giving the alarm, and the probabilities of a large fire. But any apprehensions are allayed very soon by the signal 2—2—2——6, announcing that engine No. 6 has returned from the scene of the fire, proving that it was either a trivial affair or a false alarm. No. 6 is returned to its place in the register, showing that the district is no longer unprotected. The other engines announce their return in a similar way. In a few minutes after the last one has returned, a report of the property burned, the cause of the fire and the probable loss is received from the police station in the district, all of which is registered.

At some time during the night, or perhaps two or three times, the roll is called, to ascertain if the tower men are at their posts and awake. This is done by throwing all the tower wires into circuit, and giving the private signal, which is responded to by the watchers striking the numbers of their respective towers on the gong in the office. As an instance of how acute the sense of hearing becomes by constant training, it may be mentioned that an operator can almost certainly tell by the manner in which the numbers are struck whether the reply comes from the proper tower, or another watcher is answering. For instance, if tower No. 6 answers for itself, and then attempts to answer for No. 9, the difference in the manipulation for the longer signal will be detected by the operator at headquarters. In this case, or should no reply be received, a messenger is despatched to find out why the tower is without its occupant.

Of course, where instant action is required, it is necessary that the circuits be complete, the batteries all in working order, and the machinery without fault. To secure this, the aid of music is very ingeniously obtained. A number of magnetic coils are attached to the hammers of a harmonicon, and they, with the plates of the instrument, form the opposite poles. To prove that everything is in proper order this harmonicon is thrown into connection with the other machinery, and if everything is right a complete octave from C to C is performed. Should anything be out of order one or more notes will be dropped, and the missing tone indicates where to look for the trouble.

Like all other telegraph lines, accidents will happen to the wires occasionally, and here another very ingenious contrivance is brought into use. Should there be any break in the line running up Third avenue, for instance, instead of sending a man to examine the wire from the central office to Harlem and back again, the circuit is made complete, a little instrument attached, and a current sent through the line, which travels until it meets the break, where, of course, it stops; and this point is indicated so exactly that the operator can tell almost the particular block in which the repairers must look for the trouble.—*New York Evening Post.*

THE YALE EXPLORING EXPEDITION OF 1871.

FOSSIL SEA-SERPENTS—A CURIOUS SWIMMING BIRD—REMARKABLE REMAINS—THE GREAT WATER FALLS OF THE SHOSHONE.

At a recent meeting of the Connecticut Academy, in the library of the Sheffield Scientific School in New Haven, Professor Marsh gave a sketch of the Yale exploring expedition of 1871. The New Haven *Palladium* gives the following summary of his remarks:

"The object of the expedition was to ascertain the character of the three great basins of the West; that of the plains west of Fort Lawrence in Kansas, that of the Bridge basin, just west of the main range of the Rocky Mountains and north of the Winter Mountains, and of the basaltic region still farther west, through which flows the Snake river, and, farther to the north, the Columbia. The party was in the Kansas basin in July, and worked there five weeks. The region is a parched, barren country, covered with buffalo grass, no trees, with but few streams, and what there were were very low at that season of the year. The heat was intense, ranging from one hundred to one hundred and twenty degrees Fahrenheit. The method of work was to start about sunrise and continue the examination of the country until about 10 o'clock, and then keep perfectly quiet during the heat of the day. Many of the party were unable to endure the heat; the guide, an old army scout, was completely used up, and the Professor confessed that he never suffered so much in all his life. There was constant danger of sunstroke, and at every step each man crept under his horse for a moment's shelter. The results of their work were most satisfactory. Several tuns of valuable fossils were gathered. They were mostly remains of great reptiles, corresponding to the popular idea of the sea serpent. One they exhumed measured ninety feet in length. They found also fossils of huge winged reptiles, one of which must have measured at least twenty-four feet across the wings. The largest found in Europe of equal perfection measures only three or four feet. The most curious of all their discoveries here was a fossil bird, five feet long, which is like nothing ever seen before. It appears to be a swimming bird, but has features widely different from anything known. They also made some discoveries about the extent of this great lake basin, and fixed its northern boundery.

The next region was the Bridge basin in Wyoming. Here they found another vast bed of fossil remains, that the Professor estimates at a mile in depth. It is like the eastern basin in its deposits, but the animal remains are totally distinct. The eastern has nothing but tropical animals. The only reptile found there is a turtle, and there are no fishes, but a large number of ruminants. In the western basin, on the contrary, are nothing but reptiles. It seems to have been an immense lagoon swarming with reptile life. They found five species of crocodiles, six of serpents, and many lizards. They discovered also mammals of the tapir family. In every tenth layer of the deposit may be expected a different series of animals. The deposits in which they are found are mostly sand. The scenery is very peculiar, as it is the region of cañons. The rivers have cut it through in deep gorges, subdividing this deposit, and the tops of the intervening masses have been washed down, leaving a region of conical hills with deep valleys between. He should say they found in that basin at least fifty species of animals entirely new to science. It was a much more interesting country, as regards its life, than the plains, for there was plenty of game. The scenery of the Winter Mountains is very fine, the peaks being very high, reaching fourteen thousand feet, and the lowest pass is eleven thousand feet above the sea. From this region the party went to Salt Lake, where they made some observations on the past level of the lake. The Professor concluded that at one time it must have had an outlet toward the Columbia river, through the mountains that for the northern rim of the Salt Lake. Going northward, the country changes, becoming a great basaltic plateau extending hundreds of miles. Here they visited the great Shoshone Falls of the Snake river. They are higher than Niagara, one fall being two hundred and ten feet, and the gorge is much deeper and grander. There are two falls, and a stretch of fearful rapids. A curious feature of the scene is that the traveller perceives no indication of a river till he is close upon the ravine. The country is a land of desolation. The only vegetation is the sage brush, growing about four feet high, and making travel difficult. The remains found in this country were discovered in the strata of fine clay at the base of the cañons, and were all of fishes.

From this country they proceeded north to the Blue Mountains, a range but little known, and which they had no time to explore, as it was already the middle of November. From this range they struck the head waters of the John Day river and followed it to the Columbia. The upper part of the John Day valley abounded in fossil remains of horses. They were found of all sizes and all kinds, some three-toed, some like those now living. This northern country is the grandest volcanic region of modern times. The clay strata show the effects of volcanic action, being tilted up in all directions, while in the Bridger and eastern valleys they are horizontal. They followed down the Columbia river, and at last crossed the Cascade Mountains into the Pacific slope. The scenery on the Columbia river, he thought to be the finest of the kind in the world. On reaching San Francisco, the party broke up, most of them coming home by rail, the rest, with Professor Marsh, taking the Panama route. In Central America, a large number of antiquities were collected, including a full series of pottery and some of the famous golden idols. In the explorations in the west, also, many valuable curiosities relating to the Indians were gathered for the new museum of archæology. Professor Marsh was listened to with the greatest interest, and left the impression that the expedition was one of the greatest importance and advantage to science."

PRINTING THE PATENT DRAWINGS.

We are indebted to the Hon. L. Meyer, M.C., of Pennsylvania, for a report of a recent discussion in the House of Representatives on the bill, to provide funds for the publication weekly of the drawings of patents, recently alluded to in our paper.

The project of the Commissioner, which is to publish an abstract with the drawings of all the patents, in the *Official Gazette* at $5 a year, meets with general favor and has passed the House. It now goes to the Senate for concurrence. In the course of the discussion Mr. L. Meyer, among many other reasons for advocating the publications of the drawings, said;

"By placing every particular relating to our patented inventions before the people at the earliest possible moment, many a man will desist from mental labors which he may find have been anticipated, and turn his genius into other channels; while on the other hand, by a close study which only this information and especially these illustrations will permit, many scientific and valuable improvements will be given to mankind. The project, I think, must commend itself as a most judicious one. Certainly it will have the approval of the people, and I hope there will be no dissenting voice upon its passage.

"The publication of discoveries generates in others the desire and the ability to add to the inventive arts. These inventions should be placed before the country in the cheapest manner, but, at the same time, in such form that not only justice shall be done to the genius of our inventors, but credit and honor secured to the country."

The Hon. Mr. Hoar, of Massachusetts, said:

"There are inventors all over this country who are engaged either in perfecting old machines or inventing new ones, and to whom a lifetime of laborious industry of mind and body may be saved by a prompt and perfect diffusion of this work.

"These gazettes, if deposited in the public libraries of the country, will be in a place where inventors will know where to find them, and they will keep themselves posted in regard to particular inventions, and they can send to the Patent Office for particular sheets which contain the lithographs and drawings and the printed statements of the inventions in which they are especially interested.

"Now, sir, this is a matter of immense importance to the people of a district like mine. It is of importance not only to the people of that district, but also through them to the people of the whole country. To show how important is this matter of inventions, even to the agricultural districts where not many mechanics live, I have only to relate one fact to the House. Ten miles from where I live, within the limits of my district, was born a man who by a single invention doubled the value of every acre of land producing cotton throughout the entire South. Twelve miles in another direction lived the inventor of the sewing machine, which has had an almost equal effect upon the industries of the country. Ten miles in another direction was born the man who practically introduced chloroform to the knowledge of mankind, which for the entire world has lightened the pains of death, removed the pangs of labor, and made surgery a blessing instead of an agony to the patient.

"Now, sir, each one of those three men—and I might introduce several other instances of almost as much importance—was a benefactor to the entire civilized world. Each of those men would undoubtedly have found an arrangement of this kind of immense benefit to him in his study of inventions."

SIMPLE DISINFECTANTS.—As a simple method of employing carbolic acid, C. Homburgh, of Berlin, proposes to saturate sheets of coarse millboard with the disinfectant in question. The sheets may be hung up in the rooms requiring purification, or a small piece may be torn off when a small quantity only of carbolic acid is wanted. Sheets of millboard, having an area of about seven square feet, and containing about one fifth of a pound of carbolic acid, are sold in Berlin for a shilling a piece. Dr. Hager gives the composition of a disinfecting paste for use as a washing powder. It consists of 100 parts of white clay, 1,000 parts of distilled water, and thirty-five parts of ordinary nitric acid. The mass thus obtained is allowed to stand for a few days, being stirred frequently. The supernatant fluid is then to be poured off, and the clayey mass thoroughly washed with distilled water. Five parts of permanganate of potash are now to be added, and the composition, when dried, is made up into tablets and wrapped in paper saturated with paraffin.

WHEN DOCTORS DISAGREE, ETC.—The temperature of the sun, according to Secchi's calculations, is at least 10,000,000° C; and, according to Mr. Spœrer's, 27,000° C.; while Pouillet placed it between 1461° and 1761° C. Mr. Vicaire, in a note to the French Academy of Sciences, objects to Secchi's use of Newton's law of radiation, because applicable only in case of low temperature, and accepting that of Dulong and Petit, arrives at the more probable conclusion that the temperature does not exceed 3000° C. (5400° F.). He observes that the greatest heat of the oxyhydrogen blowpipe is 2500°C. (4500° F.), and the highest furnace heat is not above 2000° C. (3600° Fah.