

will take about ten months to drive this tunnel, although the other portion of the line will be completed before that time. During the driving of the tunnel, trains will be transported over the divide by means of a series of ten switchbacks, which will be abandoned when the tunnel is completed. McLean Bros. have the contract under Mann, Foley & Larson, and have purchased a large Ingersoll Sergeant plant from the James Cooper Manufacturing company of Montreal, consisting of two large compressors, 14 air drills, boilers, pipe line, etc., the cost of which when installed will be about \$22,000. The tunnel will be driven from both ends and the driving should progress at the rate of from 8 to 10 feet per day on each end.

The Regina mine in the Rainy River district, which is owned by a close English corporation of which Sir Henry Wilkinson is the head, is the deepest mine in Ontario, the main shaft being down 434 feet. In addition to the shaft, says The Rat Portage Miner, the mine has over 2,000 feet of drifting, the longest drift being 400 feet. On the seventh level drifts are being run on each side of the shaft, and at present both heads are in fair ore. The bottom of the shaft was in good ore, when sinking was discontinued for the present, as ground enough is now opened to keep the mill running for a long time. A drift is being run under the lake on the sixth north level with good success. Stopping is now being done on the upper levels, and last week some phenomenally rich stuff was struck. The company have recently put in a battery of seven Treman stamp mills, equal to about 35 stamps of the gravity pattern, which supplanted the old 10-stamp mill. The new plant is said to be giving good satisfaction, and is treating from 1,800 to 2,000 tons of ore a month. The production of gold bullion, while not stated, is said to be entirely satisfactory to the owners, and the mine is on a paying basis. A considerable percentage of the ore is of the concentrating quality, which condition has necessitated the putting in of concentrating machinery, consisting of two 3 compound Hartz gigs, which do very good work. The mine is also equipped with a 16-drill Ingersoll-Sergeant compound condensing compressor plant. The shaft is simply a development shaft, and the company now think that in a very short time they will sink a new vertical and permanent shaft, which will mean the expenditure of many thousand dollars, but the output of the mine warrants the undertaking.

## Brief, but Interesting.

A new and highly important invention was tested at the German manoeuvres this autumn. It was in the shape of a Greek Phoenician fire, invented by a Berlin engineer. It ignites on contact with the air or water and cannot be quenched by either water or other things. It burns with a brilliant flame, and it can be sunk under water or under ground and when brought to the surface instantly bursts into flame at any desired point. It was tested during the night, off the island of Heligoland and off Kiel and proved most efficient in detecting the presence of the enemy.

At the annual conference of the Association of Municipal and County Engineers in Edinburgh, a short time ago, Donald Cameron, city surveyor of Exeter, Eng., the inventor of the septic tank system of sewage treatment, read a paper, in which he said that one of the most notable points observed in the Exeter tank had been the hitherto unrecognized energy stored in sewage, as evidenced by the production of marsh gas. The works and public paths adjoining Exeter had been lit with the gas. He had not had more than ten such lights burning at one time, but it was apparent, even under the conditions of leakage existing, that more than twice this number could be kept constantly alight, and this estimate was made during the cold, wet weather of last winter. The gas was innocuous, and could only be detected ordinarily by applying a light.

It now appears that some bodies, even without special stimulation, are capable of giving out rays closely allied, if not in some cases identical, with the Roentgen. Uranium and thorium compounds are of this character, and it would almost seem from the important researches of Dr. Russell that this ray-emitting power may be a general property of matter, for he has shown that nearly every substance is capable of affecting the

photographic plate if exposed in darkness for sufficient time. No other source for Roentgen rays but the Crookes tube has yet been discovered, but rays of kindred sorts are recognized. The Becquerel rays, emitted by uranium and its compounds, have now found their companions in rays—discovered almost simultaneously by Curie and Schmidt—emitted by thorium and its compounds. The thorium rays affect photographic plates through screens of paper or aluminum, and are absorbed by metals and other dense bodies. They ionise the air, making it an electrical conductor, and they can be refracted and probably reflected, at least diffusively. Unlike uranium rays, they are not polarized by transmission through tourmaline, therefore resembling in this respect the Roentgen rays. Quite recently M. and Mme. Curie have announced a discovery which, if confirmed, cannot fail to assist the investigation of this obscure branch of physics. They have brought to notice a new constituent of the uranium mineral pitch-blende which in a 400-fold degree possesses uranium's mysterious power of emitting a form of energy capable of impressing a photographic plate and of discharging electricity by rendering air a conductor. It also appears that the radiant activity of the new body, to which the discoverers have given the name of Polonium, needs neither the excitation of light nor the stimulus of electricity; like uranium, it draws its energy from some constantly regenerating and hitherto unsuspected store, exhaustless in amount. It has long been to me a haunting problem how to reconcile this apparently boundless outpour of energy with accepted canons. But as Dr. Johnstone Stoney reminds me, the resources of molecular movements are far from exhausted. There are many stores of energy in nature that may be drawn on by properly constituted bodies without very obvious cause. Some time since I drew attention to the enormous amount of locked-up energy in the ether; nearer our experimental grasp are the motions of the atoms and molecules, and it is not difficult mentally so to modify Maxwell's demons as to reduce them to the level of an inflexible law and thus bring them within the ken of the philosopher in search of a new tool.

The "gold from sea water" enterprise of the Electrolytic Marine Salts Co., of North Lubec, Me., has suspended operations and the "inventor" of the process and manager of the company, "Rev." P. F. Jernegan, has absconded, it is reported in The Engineering News, after having received \$338,000 of the "profits," which were derived not from sea water but from the stockholders. He sailed for Europe under an assumed name after having converted about \$100,000 cash into government bonds in New York city, and his arrival at Havre on his way to Paris has been reported by cable. Steps have been taken to have him shadowed by detectives in France until papers can be sent charging him with embezzlement, on which his extradition may be secured. It is said that about \$300,000 out of the \$10,000,000 capital stock of the company was subscribed for in Newburyport, Mass., by bank directors and leading business men, who were led to subscribe through their confidence in the judgment of A. P. Sawyer, a local capitalist, and W. R. Usher, a large shoe manufacturer of that city, both of whom were directors in the company. One report says that \$2,400,000 of the stock has been sold at par, that 45 per cent. of the money received went to the promoters, 20 per cent. to the "financial agents," and the remaining 35 per cent. into working capital, some of which was expended in the construction of the works at North Lubec, upon which 600 men have been engaged. The New York Herald of July 31 gives an interesting account of the preliminary experiments of the "inventor," near Providence, R. I., by which he obtained his first contributions of capital. It appears that a small shed was built at the extremity of a long slender wharf projecting from the shore of Narragansett Bay, and through a hole in the floor there was lowered by means of a windlass a large box containing a pan of mercury. An electric battery supplied by the "inventor" was applied during a whole night in the presence of some capitalists from Middletown, Conn., who had brought with them the mercury. The next morning the mercury was lifted from the water and given to a chemist who assayed it, and found in it \$4.50 of gold, and thereupon the capitalists, much pleased, paid the first instalment on their investment. The deception in the experiment, according to the detective, consisted in a diver's proceeding under water during the night to the box, pouring out the mercury, and substituting for it another lot of mercury containing gold. Upon this basis was floated the \$10,000,000 company. Its suc-