cine, clothing, houses, wood, etc., almost *ad infinitum*, and likewise each of the new or additional industries which they inaugurate or add to in all its various forms, require the same things. So that each thousand artisans probably adds, in one way or other, 5,000 additional to the population. Have our free trade friends ever considered this? What emptied one-fifth of the houses of Montreal under the late regime? The closing of the factories. What stunted the growth of the city during that dark era? The impediments which the tariff raised to the establishment of new industries and the development of diversified labor. All the artisans employed in the factories of the metropolis wanted homes. It required carpenters, joiners, bricklayers, painters, plasterers, roofers, glaziers, workingmen of all kinds to erect these houses. It required vast quantities of agricultural produce to fill the stomachs of the various craftsmen which the tariff furnished with a purchasing power. And although to-day the same clouds float over us, the same sun, moon, and stars light the heavens by day and night, in the language of Webster, How altered! and how changed! Of 2,000 notes falling due on the 3d of February in the Bank of Montreal, not one was protested ! ! Among the thousands of vacant houses in Montreal in '78, not an empty place is to be found, and the demand is for hundreds more. The market is flooded with money for investment. Canada fours are worth more than Canada sixes were formerly. Our alms houses, except for the old and infirm, are empty, and the soup kitchen is now a matter of history. The railways are unable to carry the freight offered to them, and the demand for increased accommodation is met by the employment of thousands of able hands, working night and day to meet the public wants! Never was there an era promising greater prosperity for Canada. Bank stocks have appreciated 37½ per cent, and all securities have become correspondingly improved in value, and the prospect of a £1,000,000 surplus for the financial year ending July 1, stares us in the face to terrify us into a free trade policy! If it is a bad policy to swap horses while crossing the stream, we think it would be rather imprudent to risk a change from prosperity, under protection, to one of promised increased (?) aggrandizement under free trade."

ARTIFICIAL DAYLIGHT.

The lighting of large interiors from without—that is, by surrounding the space to be illuminated with powerful lamps, so placed as to fill the air with diffused light—is certainly a bold, though not entirely a novel, proposition; yet, either to attract attention or to establish an important economic principle, the Northern Electric Light Company is begging Congress to allow them to light in that way the Capitol at Washington. At first they asked Congress to appropriate money enough to defray the actual cost of illuminating the Capitol and the grounds about it to the brilliancy of broad day, thus making interior lamps unnecessary. But no disposition being shown by Congress to encourage the experiment, the friends of the project subsequently offered to assume the risk of failure, and to furnish the means for making such a crucial test of "artificial daylight," on condition that the government would agree to accept the innovation in case it succeeded, and the saving in the cost of lighting the Capitol should prove in three years equal to the cost of the system. This proposition appears to have met with no greater favor than the first, whether from suspicion as to its purpose or feasibility, or because the expiring Congress had larger and more pressing interests to consider, does not appear.

The plan proposed contemplated a crown of electric lamps, 150 in number, surrounding the dome of the Capitol, and so arranged as to shine into the skylights in the roofs of the wings of the building.

In addition, at various points about the Capitol grounds, it was proposed to erect six iron towers, to be surmounted by circular conical lanterns, 11 feet in diameter, and from 125 to 200 feet above the ground, or 50 feet higher than the roofs of the wings of the Capitol. Each lantern was to contain 50 electric lamps. The 450 lamps upon the dome and in the tower lanterns were designed to be about 6,000 candle power each, aggregating something like forty times the light power now employed in and about the Capitol, or about that of 200,000 average gasburners. This light, it is estimated, would not only illuminate the interior of the building as well as daylight, but would furnish a surplus sufficient to remove the need of street lamps anywhere in the city.

To generate the electric current there would have to be supplied not less than three dozen large dynamo-electric machines, capable of absorbing the power of four steam engines of 300 horse power each. The cost of the system was estimated at $350,000, distributed as follows:

Four hundred and fifty 6,000 candle power electric lamps, at $80,	$36,000
Thirty-six large dynamo-electric machines, at $3,600	129,600
Four 300 horse power steam engines, twelve boilers, and the requisite fixtures and shafting	40.000
Houses for boilers and machinery	25,000
Six iron towers—two 200 feet high, two 150 feet high, two 125 feet high, including lanterns, reflectors, elevators, and foundations	80,000
Setting up machinery and apparatus, including cost of subterranean wires	15,000
Land	15,000
Engineering and contingencies	9,400
Total	$350,000

The estimated running expenses of the system, including repairs, is $60,000 a year—the present means of illuminating the Capitol costing annually upwards of $110,000, the city paying $60,000 more for street lamps. The aggregate illumination promised by the new system is twenty times that of all the outdoor lamps in Washington and all the lamps in the Capitol building combined: or a light equivalent to bright moonlight throughout the city, and diffused daylight in and about the Capitol.

Perhaps the incoming Congress will have time to investigate the project, which is, at all events, a "brilliant" one.

New Instrument for Sea Sounding.

Mr. Lucas, engineer to the Telegraph Construction and Maintenance Company, London, has invented an instrument for sea sounding which he styles a "nipper-lead." The old plan of ascertaining the nature of the sea bottom, by bringing up a specimen of it in a tube, let into the bottom of the sinker and armed with tallow, is open to several objections. For instance, the specimen is apt to get washed out in rising to the surface, and when it is safely brought on board it is usually so smeared with tallow as to be objectionable. The nipper-lead of Mr. Lucas, on the other hand, retains what it catches and renders it up in a pure state well fitted for preservation. The bottom of the lead or sinker in question is provided with two hollow claws or spoons, not unlike the mandibles of a crab. These are hinged to the sinker, and open out against the resistance of a stout spiral spring which is contained in the body of the sinker. When fully opened out they are kept apart by a locking device, consisting of two crossbars which meet end to end and fit into each other. The points of the open claws, however, in striking upon the bottom, spring this lock, and the claws snap together with great force, nipping up a specimen of the bottom at the same time, and from their hollow shape this specimen is retained. So effective is the nipper-lead that the claws will nip a sheet of paper off a table, and they have been found to raise a specimen of the bottom from 2,000 fathoms.

A Rich Man's Work Room.

The owner of the great Cornwall iron estate in Pennsylvania, Mr. Robert Coleman, has a fine mechanical taste and pays much attention to mechanics and engineering. To facilitate his investigations he has constructed a circular railroad with a double line of steel tracks, inclosed in a large building. The length of the track is about 150 feet, with two sidings. Patent safety switches, electric crossing signals, safety frogs, and the latest methods of fastening rails are employed. The turntables of the miniature round house operate automatically. The three small locomotives comprise every piece of mechanism, every rod, bolt, screw, lever, spring, tire, cock, pipe, and pump of the largest machines. The boiler-jackets, rods, and drivers are nickel-plated, and some of the bright work is silver-plated. The cabs are of solid walnut, and the boilers proper and the fireboxes are of wrought steel. The tenders are of copper, and their water supply is taken by scoops from vats on the roadway while the locomotives are in motion.

The locomotives are about four feet in length, including the tender, and are models of beauty. They are of English design, so far as high driving wheels are concerned, otherwise they are advanced American mechanical ideas and have many original appliances of Mr. Coleman's invention.

The locomotives are fired up and set in motion. Around the tracks they go, while the millionaire owner watches the movements of the miniature machinery. Hours are thus passed, all sorts of experiments are tried, high speed and low speed are compared to determine the comparative effects of friction, and other questions of railway economy.

A Remarkable Fish.

There was lately on exhibition in Boston a fish caught about twelve miles from the Isles of Shoals by Wallace Wright, of the fishing schooner Jennie P. Phillips, from Swampscott. At the time of its capture it was 15 feet long and weighed 2,430 pounds. In its stomach were found a codfish weighing 50 pounds, two smaller cods, and two coots. It had a large mouth, containing seven rows of sharp teeth, and in general appearance was somewhat like a shark, but what is most singular is the fact of its being uncommonly well supplied with respiratory organs. It had not only a mouth, but gills, nostrils, and blow holes. While on exhibition at Lynn the fish was examined by several scientific gentlemen, but no one has been able to classify it.

Improved Lace Machine.

A machine for making laces hitherto produced only by hand work is reported in France. Even old styles of laces, the art of making which has been lost, can readily be reproduced. The machine employs from 1,800 to 2,000 spindles, and from 200 to 300 pins. The *Moniteur des Fils et Tissu* speaks in high terms of the machine and its products, which are said to be fully equal to the best hand-made laces.

A Big Cow.

Posey County, Indiana, claims to have raised the largest cow in the world. Her name is Lady Posey; breed, mixed Durham and Big English. Her measurements are: Greatest height, 5 feet 10 inches; girth, 8 feet 9 inches; length, 10 feet 6 inches, or including tail, 17 feet. Her form is good; and, though not fat, she weighs 3,000 pounds. Her color is red and white, red predominating. Age, six years. Her present owner lives in Stark County, Illinois.

SANITARY ARRANGEMENTS IN HOUSES.

The Society of Arts, London, have just announced that they will award three medals for plans showing the best sanitary arrangements in houses built in the metropolis, such plans to be exhibited in the society's rooms, Adelphi, in June, 1881, and to be sent in on or before May 12, 1881: The conditions of the competition are as follows:

1. One silver medal will be awarded for the best sanitary arrangements carried out and in satisfactory working in a house let out in tenements to artisans for which a weekly rental is paid.

2. One silver medal for the best sanitary arrangements in actual satisfactory working in a house of the yearly rental of from £40 or less, to about £100 in value.

3. One silver medal for the best sanitary arrangements in actual satisfactory working in a house of the yearly rental value of £200 and upward to any amount.

4. The houses must be open to the inspection of judges, who, in considering their award, will be guided by the suggestions of plans for main sewerage, drainage, and water supply, made under the Public Health Act, 1875. The houses must have been in actual occupation within the last three months, and a certificate must be given by the occupiers, on a printed form, stating the satisfactory working of all the sanitary arrangements, such form to be obtained at the Society of Arts.

5. The houses may be old, fitted with modern sanitary arrangements, or may be new. They must be within the metropolitan area of the Board of Works.

6. The sanitary arrangements must include the conditions for good water supply, drainage, warming, and ventilation of the house, and precautions taken against frost.

7. The medals may be awarded to the occupiers of the houses, or the lessees, or the owners.

8. The plans must consist of a ground plan and sections, to the scale of not less than 1 inch to 5 feet; details not less than 1 inch to the foot. The plans may be accompanied by specifications.

9. The names of the architects, surveyors, or sanitary engineers who directed the sanitary arrangements should be given, and certificates will be awarded to those whose plans obtain the medals

French Electrical Exhibition.

The works for the Paris Exhibition of Electricity will soon begin. A viaduct is to be built for the English electrical railway by Siemens, which will convey visitors from the Place de la Concorde to the Palais de l'Industrie. The internal arrangements will only be made at the end of the Art Exhibition, which takes place from May to July. The French exhibitors of the electric light have come to an agreement in order to combine for the illumination of the nave and other parts. They are trying to obtain from the city an indemnity for their working expenses.

Simple Fire Escape.

The netting which trapeze performers use to break their fall, in case of accident, the *Fireman's Journal* suggests, might furnish a valuable hint to Fire Department officials. Such a net could easily be carried in a small compass attached to the hook and ladder truck, and could be readily and securely fastened by ropes to lamp posts, telegraph poles, awning posts or the like, in front of the burning house, or in case of need be upheld by dozens of sturdy and willing arms. It would, no doubt, help to save many lives of persons compelled to jump from upper windows. Such a device has been tried in Germany with good results.

Marking Salmon.

The Fish Commissioners of Maine have adopted the plan of marking salmon to obtain data with regard to the development and migrations of these fish. Several hundred salmon lately set free in the Penobscot River have been labeled with light metal tags, the number on each being recorded. The Commissioners ask that whoever catches a labeled salmon in any waters of the State will forward to them the fish, for which they will pay an extra price, or else forward the label and whatever they know about the fish that wore it.

Rectifying Alcohol.

If a quantity of 40 to 50 per cent alcohol is placed into a retort and a vacuum is created in this retort by means of an air pump, and the retort is placed into or in connection with the cooler of an ice machine, the alcohol will be evaporated. As the evaporation of the alcohol causes the temperature of the retort to drop below the surrounding temperature, the warmth of water at an ordinary temperature will be sufficient to evaporate the alcohol, and the same can be rectified without the use of fuel.—*R. Pictet, in Revue Univ. de la Brass et Dist.*

BLEACHING ALBUMEN BY MEANS OF ELECTRIC LIGHT.—The albumen, from which the blood corpuscles have been entirely removed, is subjected to the action of an electric light, the rays of which are properly collected by means of lenses, etc., and will be bleached within twenty-four hours. The albumen may be in a dry or fluid state.—*L. Manet (Monit. prod. Chim.).*

AN examination has taken place at Brussels of the railway employés, in order to test their eyes. More than one-twentieth of them have been found defective, and consequently will be discharged as being unable to fulfill their functions with a sufficient security for travelers.