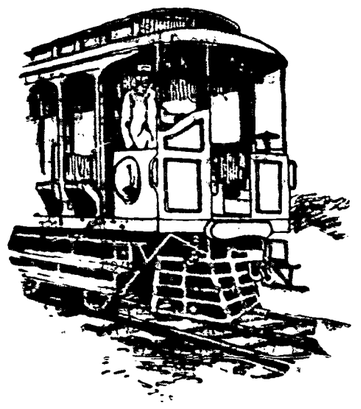
THIRD RAIL SYSTEM.

INTERESTING FEATURES OF THE EXPERIMENT AT HARTFORD.

New York, New Haven and Hartford Railroad Adopts Electric Cars For Local Traffic—How the System Operates—What It May Lead To.

A radical innovation which has attracted widespread interest has been made by the New York, New Haven and Hartford railroad, which is now running regular local trains by the third rail electric system between Hartford and New Britain, Conn.

There are two sections on the third rail road, the first from Berlin to New Britain, 3¼ miles, and the second from New Britain to Hartford, 9¼ miles. The rails are 93¼ pounds to the yard, specially rolled in the form of a flattened A. They are laid in blocks of wood resting in the ties, not fastened, but holding by their own weight. Each rail is bonded to the next to make a continuous circuit by two copper bands 12 inches long and 4 inches wide, bolted to the rail by eight bolts and nuts. The return of the current to the power house is by a heavy copper band under the third rail. At all crossings and switches



THIRD RAIL ELECTRIC MOTOR CAR.

approach blocks are placed which the shoe mounts before it strikes the rail. The sections are made "alive" or "dead" from the switch tower, the operator cutting them in as the train starts out when the train stops. The rails at any station are "dead" from the time the train comes in until it goes out again.

Instead of an overhead trolley the electric current passes to the propelling machinery of the car by two shoes 33 feet apart, which are in contact with the third rail. Each car is equipped with two 125 horsepower motors. A controller is on each platform, and on one platform is an electrical air pump for the electric brakes and whistle. This pump is stopped and started by an ingenious automatic arrangement which comes into play as the pressure in the tanks rises above or falls below 90 pounds. The current is produced at the dynamo at a pressure of 650 volts, and six incandescent lamps fed in series at an average of 110 volts burn brightly at the farther end of the line, 18 miles from the power house.

The boilers at the power station are in two batteries of five each. The engine is a Greene-Corliss of 1,200 horsepower, a cross compound condensing engine. There is room on the station for two more, and when it is enlarged, there will be room for three others, giving an aggregate of 10,000 horsepower. The dynamo is directly connected to the engine and is of ten poles, 850 K. W. of 600 volts without a load, and 650 when loaded.

At Hartford and Berlin the tracks are fenced in. The only way to get into danger is to climb the fence or crawl under the car. The danger is in putting one foot on the third rail and the other on the ordinary rail on the ground, but the latter is not specially dangerous unless the ground is quite wet. At crossings there is no danger whatever, as the third rail is disconnected and the electric current passes beneath each crossing by a cable which is insulated in wooden boxes.

Great things are expected of the third rail system. President Clark of the New York, New Haven and Hartford road is reported to have said that lines competing with steam roads could not prosper when the day comes to lay third rails in this country. He suggested that locomotives might eventually be discarded, just as the old stagecoaches were.

Commenting upon President Clark's remarks, Colonel H. G. Prout, editor of The Railroad Gazette, said:

"Mr. Clark occupies a peculiar position, which should always be considered in reading what he has to say about the use of electricity in railroading. His railroad system is probably more vulnerable to the competition of parallel trolley lines than any other great system in the United States. He has therefore very wisely planned to make use of electricity upon those portions of his lines where it can be advantageously employed. This, however, involves more than the simple question of the cost of doing the work. It is complicated by the necessity in his territory of giving people the kind of service that they can get from the electric street railways—that is, a service which is best rendered by providing small and very frequent transportation units. In my opinion, however, considering the present state of the art, the day when steam locomotives will be discarded is not yet in sight. No one can yet foresee it. It is still a fact (undisputed by a great majority of competent students) that much the largest portion of the railroad business of the United States can be done at less cost with steam locomotives than by any known means of electric propulsion."

Joseph Wetzler, editor of The Electrical Engineer, believes that the third rail system is well adapted for long distances. He thinks the difficulties of having the third rail exposed could be obviated and that the system can be used with safety.

PASTEURIZED MILK.

A Simple and Effective Process of Sterilization Explained.

Consumption is a disease caused, as is now generally recognized, by a specific micro-organism, and this organism is often found in the milk of tuberculous cows, such cows being quite numerous—perhaps 10 per cent of all those existing in the state of New York. The more highly bred the animal is the greater is the probability of its being tuberculous. As some 90,000 persons die in the United States every year from consumption alone, the importance of the milk supply can hardly be overestimated. Typhoid fever also is due to a specific microbe, usually found in water and in milk, having been conveyed from the former to the latter when the cans were washed or when the milkman diluted the milk to increase his profits.

The stomach disorders of infant life are so frequently due to contaminated milk and are so well known that any remarks upon them seem unnecessary.

The process of pasteurization is superior to sterilization by boiling, because it does not make the milk less digestible, as boiling certainly does. A bottle or other vessel containing fresh milk should have its mouth plugged with clean absorbent cotton. This vessel should then be placed inside any convenient vessel, water being poured into the latter until it reaches the level of the milk. It is necessary that the milk holding vessel be raised half an inch from the bottom of the outer vessel, for which purpose a perforated tin pieplate may be used. A free circulation of water around the milk vessel is requisite.

The apparatus described above should be heated on a fire or stove until 155 degrees F. is reached. The temperature of the water must not be allowed to exceed this. When the degree of heat has been produced, the vessel ought to be removed from the fire and should be kept covered for half an hour. The bottle, or bottles, of milk must then be taken out of the water pan and put in a cold place, but the cotton should not be removed from the mouth of the milk bottle until the time for using the milk has arrived.

This milk may be safely used at any time within 24 hours after it has been boiled. By means of an ordinary dairy thermometer the temperature of the water may be tested at any time. It is not necessary to ascertain the temperature of the milk. Persons of the consumptive type and those who belong to consumptive families should not at any time partake of milk in any form unless it has been pasteurized.—Popular Science News.

The First Big Bridge.

The pioneer in railway bridge building on this continent so far as colossal enterprises are concerned was the Grand Trunk railroad. Old timers remember the opening of that Grand Trunk wonder, the Victoria bridge at Montreal, spanning the St. Lawrence river. But that great bridge is not adequate to the growing traffic of the Grand Trunk, and it is now proposed to widen the Victoria bridge, and half a dozen prominent American bridge firms are considering the somewhat exacting conditions with a view to bidding upon the work. This bridge was over five years in progress of construction and was finished in 1859. It is two miles long, cost over $5,000,000, and contains 10,500 tons of iron and 8,000,000 cubic feet of masonry, besides considerable embrowned lumber, which helps to conceal its real strength and massiveness.

A Chinese Typewriter.

The Rev. Mr. Sheffield, a Presbyterian missionary at Tung Chow, has invented a Chinese typewriter, which is said to be a very remarkable machine and is exciting a great deal of comment over there. As near as can be understood from the description published in the Chinese papers, the characters, about 4,000 in number, are on the edges of wheels about one foot in diameter. It requires 20 or 30 wheels to carry all the letters, and the operator must strike two keys to make an impression. The first key turns the wheel and the second stops it at the letter wanted, which is brought down upon the paper by an ingenious device.

Queen Victoria to Touch the Button.

A press dispatch from Montreal states that Queen Victoria has been asked, through Lord Aberdeen, and her consent is expected, to touch a button in London and thus start the big electric works of the Lachine Hydraulic and Land company, which are to supply some hundred thousand of horse power to Montreal. This is the largest electric installation in the British dominions.—Electrical Review.

Measuring Brick Work.

To ascertain the number of bricks in a wall, obtain the number of superficial feet and multiply this by 7 for a 4 inch wall, by 14 for a 9 inch wall, by 21 for a 13 inch wall and by 28 for a 17 inch wall. If the wall is thicker than 17 inches, add 7 bricks to every additional 4 inches.

Sell Air by the Bottle.

Liquefied air can now be ordered by the dozen bottles in Munich, but just what it can be used for in a general way is in doubt. It is so cold that it blisters the skin at a touch, but its excess of oxygen is a valuable feature. At present chemists are the only customers for it.

When Steam Ceases to Be Steam.

When steam becomes visible, it ceases to be steam. The exhaust seen coming from an engine consists of particles of liquid water mixed with air which is gradually absorbing it.—American Machinist.

Edison's Patents.

During the last 25 years the United States patent office has granted 771 patents to Thomas A. Edison.

A SUBMARINE BOAT.

THE HOLLAND PROMISES TO REVOLUTIONIZE MODERN NAVAL WARFARE.

What Is Claimed For the New Vessel. Able to Withstand the Pressure of Water at a Depth of 150 Feet—Commercial Uses of Submarine Craft.

The successful launching at Elizabeth, N. J., of the new Holland submarine torpedo boat created a considerable sensation, as it is claimed the vessel will revolutionize marine warfare.

The construction of the boat has been eagerly watched all over the country. It is cylindrical in shape, is 50 feet 3 inches long, with a 4 foot screw protecting extension, 10 feet 2 inches in diameter amidships, and the molded diameter is the same. According to the inventor, she can travel under water eight knots an hour for eight hours, and ten knots on the surface. The power comes from a gasoline engine and a dynamo, the former to be used when the boat is sailing along the surface and the latter when she is submerged. It will, it is expected, take less than a minute to submerge the boat and about the same length of time for her to rise to the surface.

THE HOLLAND SUBMARINE BOAT.

The armament consists of three torpedo tubes, one at the upper bow of the boat being an aerial torpedo thrower with a range of one mile. Six projectiles, weighing 180 pounds each, with charges of 100 pounds of explosives, are to be stored for this gun. There is an expulsion tube for Whitehead torpedoes almost directly beneath the torpedo thrower. But three of these will be carried, as each weighs 850 pounds. There is a submarine gun at the stern of the boat, which, with a 100 pound charge of explosive, is expected to hurl a 400 pound projectile 100 yards through the water. Five of these will be carried. Six men will constitute the crew.

The Holland will be able to dive and run at any depth below the surface down to 100 feet and can be instantly adjusted to maintain any fixed depth while running. If running under a fleet in deep water, she would, of course, need at least 50 feet of clear depth over her, but when attacking a ship might take a higher level, so as to be able to come quickly to the surface now and then for an observation. She has a powerful hull and could stand the pressure at 150 feet if necessary, but for fighting purposes would never be required to go to a great depth.

In the serious business of war the submarine torpedo boat has such a manifest advantage that the only question ever raised is, Can you build one? A few more weeks will apparently settle this question in the affirmative, and the indications are that, with every government in the world armed with submarine ships within the next ten years, naval warfare will become very unpopular.

In the fascinating pursuit of lost treasure and the exploration of submarine property the submarine boat will doubtless become a great aid to the wrecker and diver and make possible the lifting of ships that otherwise could not be reached, and add much to our knowledge of the sea. Most of the wrecks that are going down every day lie less than 250 feet from the surface—not too great a depth for submarine boats—and with their aid in sweeping chains and fastening them to pontoons a much larger proportion will be recovered than in the past.

Fairy Stories About Liquefied Air.

The circulation of wonder stories as to the things to be done with liquid air is now in order. The operation of liquefying air has become a tolerably familiar one. The cost of the liquefaction upon a commercial scale is far from being settled. As to the storage and transmission of the liquid when its temperature must be kept at more than 200 degrees below zero, it will not easily be believed to be practicable or profitable.—American Machinist.

Welding Cold Metals.

Professor Roberts-Austin has made the remarkable discovery that metals are not only capable of diffusing into each other when they are molten but also when they are cold. He has shown that if clean surfaces of lead and gold are held together in vacuo at a temperature of only 40 degrees for four days they will unite firmly and can be separated only by a force equal to one-third of the breaking strain of lead itself.

The First Steel Pen.

Sixty years ago Joseph Gillott was a working jeweler in Birmingham, England. One day he accidentally split one of his fine steel tools, and, being suddenly called on to sign a receipt and not finding a pen handy, he used the split tool as a substitute. This led to making pens of metal.

Makes Buildings Fireproof.

A paint to make building fireproof, recently patented, consists of water, caustic soda, salt and blue vitriol mixed together to form a liquid of the thickness of paint, the compound being discovered by a Washington woman.

Killing Insects on Fruit Trees.

A California man has a steaming process for killing insects on fruit trees. The process consists of heating the atmosphere about the trees to about 120 degrees, which does not injure the tree, but destroys insect life.

American Sawmill For South Africa.

A shop in Tacoma is building a $100,000 sawmill outfit to go to Delagoa Bay, South Africa.—American Machinist.

DANGER IN THE X RAY

NIKOLA TESLA ADVISES EXTREME CAUTION IN ITS USE.

Injuries In Most Cases Due to Carelessness—Precautions Suggested by Mr. Tesla—Results of His Experiments—Some Healthful Influences of the X Rays.

It may be considered a rule of nature that every beneficent manifestation of force may be accompanied by deleterious effects unless guarded against by suitable precautions, and the Roentgen ray is no exception to the rule. The very earliest experimenters in this field noted a harmful action of the rays on the skin, but of late instances have been reported of serious injury due to so called X ray burns. It is probable that the cases mentioned are due more to neglect or improper treatment of the injury than to the original effect of the "burn." Nevertheless, it is eminently desirable that all possible means be adopted for the prevention of the injury to begin with, on the old principle that an ounce of prevention is better than a pound of cure. Mr. Nikola Tesla has doubtless done as much X ray work as any one, and with apparatus whose sheer power has probably not been exceeded by that of any worker in this field, and invariably without harmful results when certain precautions were taken. The means employed with such good results and their raison d'etre are described in an interesting communication appearing in our contemporary, The Electrical Review.

For the prevention of X ray burns Mr. Tesla finds that a chief precaution is to interpose between the bulb and the person a thin sheet of aluminium or aluminium wire gauze connected to the ground directly or through a condenser. This screen, according to Mr. Tesla, prevents the formation of electro-static streamers, which would otherwise issue from the body and which have an irritating effect. In the course of his experiments Mr. Tesla observed, however, that the injurious effects did not seem to diminish gradually with the distance from the terminal, but ceased abruptly. He accounts for this as due to the effect of the ozone generated and supports this view by the fact that the generation of ozone ceases at a definite distance from the terminal.

But perhaps the most striking fact developed by Mr. Tesla in these investigations is that bulbs containing platinum electrodes are more injurious than those provided with aluminium electrodes, in support of which assertion he cites a number of experiments.

To sum up, Mr. Tesla advises: First, the abandonment of bulbs containing platinum; second, the substitution for them of a properly constructed Leonard tube, containing pure aluminium only; third, the use of a protecting aluminium screen, as indicated above, or instead of this a wet cloth or a layer of fluid; fourth, exposure at no less distance than 14 inches, and preferably to expose longer at a greater distance.

As regards other physiological influences of the X ray, Mr. Tesla records the fact that since he has begun to work with the X rays his health has been improved and he has been entirely relieved of a troublesome cough. This same effect was observed on another person.

Mr. Tesla stands practically alone in his advocacy of the corpuscular theory of the Roentgen rays, but his faith in its correctness seems to be growing stronger as time passes and his experiments multiply.—Electrical Engineer.

New Roofing and Flooring Material.

A new roofing and flooring material, said to be both fireproof and waterproof, has been developed in Zurich, Switzerland. The principal ingredients are waste paper, sawdust and certain chemicals which make the mass a sort of artificial stone. The substance is mixed like mortar and spread on the place to be covered, where it dries and hardens in one or two days. While very hard, it is also elastic and will stand some bending without cracking or breaking. As laid for roofing it weighs about 26 pounds per square yard in a layer of five-eighths of an inch thick and costs, laid, about $1 per square yard. It is a nonconductor of heat and is noiseless, which commends it for flooring purposes as compared with tile or concrete. Several schoolhouses in Zurich are said to have been floored with the material.—Engineering News.

Telephone by Barbed Wire.

On a ranch in California telephone communication is established between the various camps and also with the public system by means of barbed wire fences. Insulators are not required. The lines are raised over the gateways.—Electrical Review.

For Tobacco Fiends.

One of the latest patents is for a time lock on a tobacco box. The user sets the mechanism when the pressure of good resolutions is strong, and when appetite is in the ascendant he has to borrow a "chew."—American Machinist.

No Hand Rocks This Cradle.

A newly patented cradle rocks itself by means of a clockwork mechanism, a rod running from a slowly revolving wheel to the upper part of the cradle to rock it back and forth, the rod being adjusted to rock it fast or slow.

Aluminium Helmets.

Aluminium helmets have not proved entirely successful in the German army, the saving in weight being more than offset by the metal's storing heat, even to blistering the foreheads of the wearers.—Scientific American.

Milwaukee Industrial Exhibition.

The sixteenth annual exhibition of the Milwaukee Industrial association will open at Milwaukee on Sept. 7 and close on Oct. 9. No charges for space, light, power, gas or water are made to exhibitors.

DIOCESAN NEWS.

What Our Friends in the Surrounding Parishes are Doing.

From Our Special Correspondents.

Dansville.

Miss Anna Burns of Buffalo has been visiting her cousin, Miss Rose Rowan, for a few weeks.

Miss Belle Goodwin of Ovid was home for a few days last week.

Mr. and Mrs. Thomas Costello of Buffalo have been visiting relatives in town.

Twenty eight children received their first communion at the early mass last Sunday, and renewed their baptismal vows and were enrolled in the scapular in the afternoon at Vespers.

On Monday evening, in St. Patrick's church, five young ladies were received into the society of the Children of Mary. The services were conducted by Rev. J. T. Dougherty, with a very interesting sermon by Rev. Dr. Hanna of St. Bernard's seminary.

Mrs. Frank Schuster died at her home on Elizabeth street Sunday afternoon. The funeral took place from St. Mary's church Wednesday morning, the society of the L. C. B. A., of which she was a member, attending in a body.

Spencerport.

Miss M. B. Meskill of Rochester spent Sunday with her parents.

John Pandergast of Rochester spent a few days the past week in town, the guest of his parents.

Miss Lillie Malone spent a few days in Rochester the past week.

Miss Margaret Whelehan and brother Thomas, of Mt. Read, spent Sunday with Miss Margaret Kinney.

Miss Nellie Malone, who has been teaching in Hilton, is home for school having been closed for the summer.

The ladies of St. John's church will hold a strawberry and ice cream festival Thursday evening, June 10th, at Bemis hall.

Miss Mamie Leonard is visiting relatives in Trenton, N. J.

Mrs. W. D. Kinney and daughter Agatha spent Thursday in Rochester.

Miss Quinn of Charlotte and Messrs. John and William Whelehan of Mt. Read spent Monday in town.

Lyons.

The Palmyra base ball team played two games with the Lyons team here last Saturday, the score in the forenoon being 7 to 3 in favor of Lyons. The afternoon score was 10 to 9 in favor of Lyons. Lyons played two games at Palmyra Monday, the forenoon score being 20 to 12, 12 innings, in favor of Palmyra, and the afternoon score was 13 to 1 in favor of Lyons. This gives Lyons second place, Palmyra taking next to the last place.

Joseph Knittle spent Sunday in Rochester.

Misses Deming, Dunn and Wright, and Mr. Wade of Newark wheeled to Lyons last Sunday.

Mr. and Mrs. Fleming of Rochester were guests of Mrs. Bradley Saturday and Sunday.

Pittsford.

Memorial day was observed by decorating the soldiers' graves and bicycle race, and a base ball game between the Second Nine and Pittsfords, the score being 19 to 15 in favor of Pittsford.

Albert King and some lady friends rode to Scottsville last Sunday on their wheels.

Mrs. M. Hoffman and daughter of Rochester visited her mother, Mrs. Sullivan, last Monday.

Mrs. P. Lannan had a slight attack of tonsilitis last week.

Miss Alice Burns is suffering from a sprained wrist.

J. McCarthy and James Kennedy were in town one day last week.

Canandaigua.

Ralph Golet of Lockport and Miss Minnie O'Grady of Rochester were the guests of Miss Maude Smith at her home on Bristol street during the first part of the week.

On Monday occurred the death of Mrs. Devine, an old resident, at the home of her daughter, Mrs. Doran, on Park street.

Many from here attended the ball games at Auburn and Phelps, Decoration day.

Miss Cora Goldth has returned from a visit to her sisters in Rochester.

Penn Yan.

Martin Powers of this village, track foreman of the Northern Central Railroad, met with a serious action on Tuesday. The accident occurred between the station and the bridge over the outlet. Mr. Powers was on a hand car, with three other employes, and going about three miles an hour, while in attempting to change his position from the rear of the car to the front, in order to warn a man who was on the track ahead, he lost his footing and fell upon the track, the car passing over both of his legs near the hip. A deep gash was cut in his right thigh and he was badly bruised about his body. He is now doing well, but it will be some time before he will be able to resume work again. The car weighed 900 pounds and had three men upon it. It is fortunate that Mr. Power's injuries were not more serious.

Mr. Henry Farrell will engage in the grocery business on June 1st.

Mrs. Agnes McAdams, of Syracuse, is visiting friends in town.

Miss Mary Scanlon is the guest of her sister, Mrs. H. J. McAdams.

Miss Margaret O'Malley and her brother Luke O'Malley, are visiting relatives in this place.

Mr. Peter Shaw, of Brooklyn, is visiting friends in town.

Memorial day was fittingly observed in Pen Yan. Mr. Thomas Carmody was the president of the day, and after the regular exercises at the Court House park and cemetery, the procession marched to St. Michael's Parochial school, where Mr. Carmody on behalf of the A. C. H., presented the school with a beautiful American flag. The gift was accepted by Rev. Father Angelo on behalf of the school, who responded in a pleasing manner to Mr. Carmody's speech. Mr. William Hyland sung a solo, after which the flag was raised on the school building.

Branch 350 L. C. B. A., was organized on May 27th, by Supreme Deputy, Mrs. Katherine J. Dowling of Rochester. After the installation, the members of the C. M. B. A., were entertained by the Association and a pleasant evening spent by all.

Macedon.

Mr. and Mrs. A. Krug of Rochester spent Saturday and Sunday with her parents, Mr. and Mrs. C. Sullivan.

Misses Maude Brick and Anna Ryan of Palmyra, were the guests of Miss Ada Cullen, Thursday.