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## ON THE ERIE CANAL

THE ELECTRIC TROLLEY IS SUCCESSFULLY TESTED.

The Tow-Path About to Give Place to Electricity—A Recent Experiment—Some Important Inventions and Discoveries.

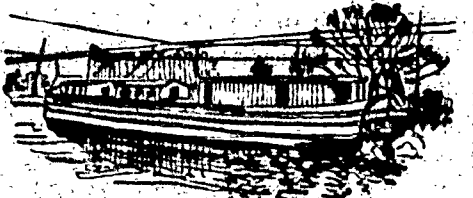
A section a mile long of a canal level east of Brighton, near Rochester, N. Y., was selected for the experiment. Work was begun on November 13, and on November 17 the span wires and trolley wires were in position and the boat was ready for the experiment. A canal boat, christened the Frank W. Hawley, was fitted with motors. A double line of trolley wires was used and the boat carried two trolley poles, thus working without grounding. The switchboard was located near the helm. On Friday, November 17, a private trial was made with success. On Saturday the official trial took place.

Governor Flower and a large party of guests and representatives of the interests concerned were on the boat. To the executive was assigned the turning of the motor switch. On his doing so the motor started and the propeller began to churn up the water. The boat started off and in a few minutes was moving along at about four miles an hour. Curves and a bridge were passed without trouble and a lock was entered. The boat was loaded with sand ballast and her deck was crowded with people. A strong head wind and a head current were encountered.

Other causes also did much to interfere with a successful issue. The pressure given was from 200 to 300 volts instead of 500 volts as it should have been. Under this pressure, 60 amperes of current were taken, so that about 15,000 watts at the most were absorbed, indicating about 20 horse power. The boat was an everyday canal boat, with an old type propeller. Its preparation for the trial consisted in the removal of its boiler and engine, and the introduction of two street car motors. Each was of 20 horse power, and the two motors were connected directly to the propeller shaft. Under the circumstances the experiment was a very great success.

The lines were about five feet apart, and were strung about two-thirds of the width of the canal from the berm bank or tow path. The trolleys were regular street car trolleys. It is proposed to use a trolley running on the wire and connected by a flexible conductor with the boat, so as to permit the craft to be steered in any direction. Under the present arrangement the trolley lines have to be followed within the limits of a small lateral deviation.

Much expense, it is hoped can be saved by this use of electricity. The maintenance of the Erie canal costs the state of New York almost \$1,000,000 per annum, of which the greater part is devoted to the tow path. The abolition of the tow path would save in this item a good deal of money. By



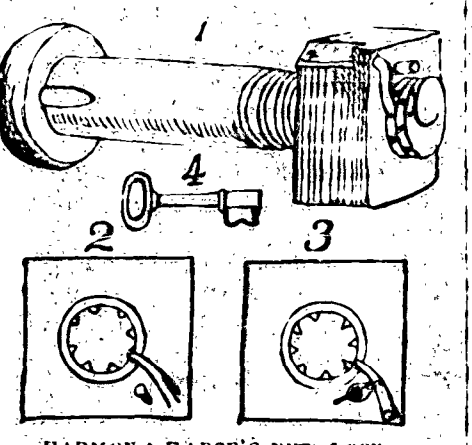
Increased average speed it is believed that the capacity of the canal can be doubled or tripled, while material reduction can surely be made in the help required to run a boat.

**Higher Temperature for Furnaces.**  
The subject of obtaining higher temperatures in steel furnaces has lately been discussed by the Society of Civil Engineers, Paris. At present, it is stated, the temperature is limited by that at which the walls of the furnace begin to fuse, and even Deener's fire bricks are not found proof against this. Magnesia is claimed to be capable of standing far higher temperatures than that kind of brick, the principal difficulty in using it being the excessive shrinkage to which it is liable when heated—a cube of magnesia of ten-inch edge, in the raw state, is said to shrink to one of six-inch edge when sufficiently calcined—and, such being the case, furnace linings made of this material are liable to crack badly; as a remedy for this state of things, the magnesia is caused to undergo its maximum possible contraction before being placed in the furnace, though for this an exceedingly high temperature is required. M. Lenocheux claims to have overcome these difficulties, and has exhibited a number of perfectly solid bricks of magnesia, which were as dense as granite, and had been thoroughly shrank. The composition of these bricks is 94.55 to 95.25 magnesia, 1.50 to 1.00 lime, 0.75 to 1.25 alumina and iron oxide, 1.50 to 2.50 silica.

**Intensity of Sound.**  
A very ingenious apparatus for measuring the intensity of sound is described in a German paper. A narrow glass tube bent at a very obtuse angle is half filled with alcohol; one end of the tube has a conical opening, and this is placed at a distance of 0.5 cm. from the opening of the resonator, the whole being mounted on a board capable of adjustment to any angle; the tube is placed in the resonator, when resonating to a sound, affect the level of the alcohol, and the displacement

is read off on a scale attached to the tube projected, if necessary, on to a screen. In the observation of that interesting effect of sound—repulsion—a light resonator of the ordinary construction is floated on water, its axis being horizontal by means of an attached piece of wire, and, on blowing the horn the sphere will float in the direct opposite to that in which the neck is pointed. To produce continuous rotation, four resonators are attached to a light cross of wood turning on a needle point, or one resonator with four bent necks is suspended by a thread.

**An Improved Nut Lock.**  
This nut lock is especially adapted for securing the fish plates upon railroad rails and other similar uses. Fig. 1 shows the application of the device; Fig. 2 being an end view representing the nut engaging the bolt, and Fig. 3 showing it disengaged, while Fig. 4 is a key used to release the lock. In one corner of the nut is secured one end of a piece of spring wire, as shown in Fig. 1, the other end of the wire being bent at a right angle to the axis of the nut, and forming a locking limb, pointed and slightly curved near its end. In the bottom of the spiral track of the bolt thread are a number of cupped indentations, adapted to be readily engaged by the pointed end of the locking limb, the latter springing sufficiently to permit the nut to move freely as it is screwed upon the bolt body, but preventing backward movement of the nut by its engagement with one of the indentations. To disengage the spring locking limb from the bolt, the key is placed on an adjacent post in the end wall of the nut,



**HARMON & FABER'S NUT LOCK.**  
and the turning of the key springs the locking limb away from the bolt, one key serving for use with any number of similar nut locks.

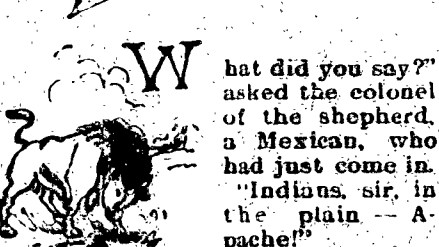
**Winding Cotton Thread.**  
An automatic winder of cotton thread has been contrived, a mechanism which takes thread from eight large spools loosely wound and transfers it to eight small spools, containing 200 yards, these small spools having received 200 yards exactly, stop-revolving, a knife cuts a slot in the spool, the end of the thread is fastened in this machine then cuts the thread off, drops the spool into a tray, takes eight empty spools from as many hoppers, places them on the spindles and fills these as it did the previous set. The machine goes through the entire process in just forty-five seconds, making all changes automatically and with the greatest precision. Further, in another machine the small spools are placed on an inclined track and in rolling through the machine receive on each end a ticket cut from a long strip or roll of previously printed tickets placed on a stand above the machine. After the ticket is cut, paste is applied to the back and it is then pressed upon the spool, which has rolled into proper position to receive it. This at the rate of ninety spools per minute.

**An Important Discovery.**  
It seems that, recently, powdered metallic arsenic, which in the process of powdering had been moistened with water, to prevent dusting, exhibited the capability—not hitherto recorded—of spontaneous combustion, according to an account in a German scientific paper. A quantity of powdered arsenic had been received in a double paper bag, late in the evening, and set aside over night in a basket containing other articles packed in straw and sawdust. On the following morning, upon opening the store, the peculiar garlick-like odor attracted attention to the basket containing the powdered arsenic. An examination disclosed the fact that the arsenic had agglutinated to a solid glowing mass, and that the paper containers had been charred, a portion of the straw being also scorched. A number of bottles in the basket had also burst, owing to the high heat, and upon the charred paper bag were sublimed some beautiful crystals of arsenious oxide. A fire, which probably would have been attributed to some other cause, was in this case averted.

**Etching on Glass.**  
It is now found that in the art of etching photographs on glass, a very satisfactory result may be secured by covering the surface with a solution of gum made sensitive with bichromate of potash, and printing the same under a negative; after the image has in this manner been produced, it is dusted over with minium or red lead and the red mixture which is thus obtained is mixed and burned according to the usual process. The easily soluble red glass which comes from this method is treated with strong sulphuric acid, when a white matt design is produced, and the picture appears by transmitted light as a positive. Some specimens in this line by German artists are described as exhibiting superior merit, as compared with those produced by ordinary means.

**His Idea of It.**  
Sunday-school teacher—Bobby, can you name the three graces?  
Bobby—Yes; in the world, the flesh and the devil.

## DECOYED INTO DANGER.



What did you say?" asked the colonel of the shepherd, a Mexican, who had just come in. "Indians, sir, in the plain—Apache!" "None sense!" was the reply. "Among us at the time were Ben Mellor and his sister, her friend, a Miss Nevil, and two other men named Radcliffe and Mitchell. The colonel was my partner in the rancho (rancho). Bowler was his name—mine doesn't matter."

"Indians!" exclaimed Miss Mellor; "surely they won't come here!" "Indians is queer cusses. But you may depend when they do come they won't give us much notice. Let us ride up and see."

In the course of a few minutes we all rode out into the plain. On we went until road gave way to path and path to desert track and this to desert—a world of grass, with here and there a tree. Beyond a pond of water, called by the natives estaque, near which the herds of sheep and goats were gathered. Out on the plain was a moving mass, which the dark shepherd called Indians.



A REMARKABLE TABLEAU.

"Who, it's buffalo!" cried my partner. "Hurrah, hurrah!" "You must ride back, ladies," I said; "this chase will be a long one. Radcliffe will escort you, perhaps."

"Oh, no; we can take care of ourselves. We are armed and can shoot if necessary," replied Miss Mellor. "Come on, Violet; let these hunters go their own way. Manuel (the shepherd), will accompany us."

So we parted. We all had pistols, and two of us carried rifles as well. Mine was hung by my saddle, but we did not anticipate any attack. The shepherd had turned back with the ladies. I did not altogether trust him, and mentioned my suspicions to the colonel. "Oh, he can't hurt; they'll soon settle him," was my friend's reply; "he's a billman certainly and I'm not sure that he's over-honest, but he can't hurt the rancho."

Had my random bullet struck one of the ladies? Had I killed or wounded Miss Mellor or her friend? Was it possible?

In my anxiety I spurred poor Pedro and was intent on dispatching the buffalo when two pistol shots rang out from the direction of our rancho. One lucky shot, the bull fell; another in the heart; my victory stood complete! But my joy was very quickly tempered with alarm, when I heard a savage yell, which I could not mistake.

Great powers! Indians at the rancho! And the ladies—

My heart leaped to my throat. Hastily loading all the chambers of my Winchester, I spurred my steed for home. The house was not far distant and in a few minutes I came within view.

The door stood open. In front were six Apaches, held in check at thirty paces distant by a woman and a servant—a youth—both of whom were armed and actually defying the Indians for the moment.

Why they had opened the door I could not understand. It would not easily have been found, and the windows were handier for the assailants. Yet here they were, standing irresolute. There was no time to be lost. My approach was almost unheeded as I emerged from the cover of the wood around the house. One glance was sufficient.

Halting, I fired all the chambers of my rifle in quick succession. An answering fire came from the hall. Four Indians dropped; the others fled at once, after discharging a volley of arrows at the defenders, who avoided them by promptly lying down as soon as they saw the bows drawn.

My astonishment was extreme when in the defenders of our house I recognized Miss Mellor and a shepherd—not the young stranger who had informed us of the neighborhood of Indians. In a few moments I was in possession of the facts, but Miss Nevil was missing and Miss Mellor was in the greatest distress concerning her. It appeared that the dark-skinned new shepherd had carried her away into the wood, and the servants, who now began to assemble gave evidence that he had actually done so.

As we were discussing the chances, the other members of our party, alarmed by the reports of firearms, had come up. A search was at once instituted. The cry which I had heard while chasing the buffalo was still ringing in my ears. We hurried into the wood, or scrub, and after a search were rewarded by hearing a faint cry for help. We searched in the direction of the sound, and a most remarkable tableau met our gaze. On the ground lay the dark-featured shepherd dead; his body pierced by a bullet from my Winchester. Standing beside him was an Indian pony, and strapped to the body by a belt lay—rather hung—Miss Nevil, quite unable to move and but half sensible.

A few moments sufficed to relieve her from her perilous position. She afterward told us how the shepherd, in league with the Apaches, had attempted to plunder our house and carry her off. The buffaloes were only a decoy, driven in by some of the tribe, while others plundered us. The traitor shepherd had attempted to carry off Miss Nevil, but the first shot which I had fired struck him and put an end to his career. My second bullet had glanced away, fortunately, perhaps; but Miss Nevil's scream of terror had guided me to the house.

I need hardly say that the rescue was entirely due to the course adopted by the bull, and we were very grateful for his share in the business. But, alas for sentiment! we needed beef, and many an excellent meal was made from what Radcliffe ever afterward termed "that blessed buffalo."—Saturday Post.

**POWER OF A KIND VOICE.**  
Controls a Horse Where a Harsh Order Would Have Raised Rebellion.  
"I don't know when I have seen a more striking illustration of the power of kindness," said a Chicago man, the other day. "A man drove a grocery wagon up to the house opposite mine and started in to deliver some groceries. He had expected the horse to stand, but the horse kept on moving. The man turned around and threw a potato at him, but the horse didn't mind that a bit—he kept right on walking."

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