THE GORGE ROAD AT NIAGARA FALLS.

(Continued from first page.)

A mass of water will be seen forming a wave whose contour will hardly change. In the illustration the long descent of the road is shown and the car is seen entering upon its course through the gorge. At this point the line is comparatively straight.

Visitors to Niagara will remember the somewhat confusing number of elevators by which the rapids were reached from the vicinity of the Suspension Bridge. Now the elevators have been stopped, with the exception of one, which will probably be maintained in operation forsome time to come. Our view is taken near the foot of this, the Buttery elevator.

For about a mile the rapids continue, when the river opens up and bends to the right, forming on the left a species of bay, into which the waters penetrate with a slow rotary motion, forming thecelebrated whirlpool. The view at this point is peculiarly attractive. The cliffs rise some two or three hundred feet and are darkly wooded, and the winding course of the road along the bank opposite the whirlpool gives a charming prospect. Without losing interest, the view now becomes more quiet, the river in its lower rapids being at least comparatively tranquil. A short distance below the whirlpool a monumental shaped rock stands on the outer side of the track, a conspicuous object, termed Giant Rock. On the right of the road is the Devil's Hole, a cave and gorge which was seen by La Salle in 1678, and which on September 14, 1763, was the scene of a fearful massacre of a company of English soldiers by the Seneca Indians. During the construction of the road relics of the massacre—bayonets, buttons and equipments—were found in considerable number.

As Lewiston is approached the cars pass under the ruins of the old suspension bridge, the first one that ever spanned the river, and, in its day, the largest in the world. It was begun in 1848 and finished in 1850. In 1863 it was wrecked, and its ruins have ever since remained in partial suspension above the now placid waters of the river.

The entire length of the road, from Niagara Falls to Lewiston, is about 7 miles. Each car has two 50 horse power Westinghouse motors and electric heaters. The power is now supplied by the Niagara Falls Hydraulic Power and Manufacturing Company, utilizing the water from the Schellkopf surface canal, at 210 feet head. Two Westinghouse 50 horse power generators supply the current at 500 volts potential. The line is laid with 60 lb. steel rails, double tracked throughout, with trolley wire of 00 gage. With the exception of the descent from the high land to the river, the maximum grade is 1¼ per cent. Among the possibilities for the future the generation of power for the road by a current motor has been suggested. The road is operated under the superintendence of Mr. J. R. Brooks. The chief engineer is Mr. G. H. Ricker.

A Proposed New Ship Canal.

A bill is before Congress to incorporate the Maritime Canal Company of North America, and providing for the construction of a ship channel not less that 26 feet in depth and 300 feet in width, from Lake Erie to Lake Ontario, and from Lake Ontario or the St. Lawrence River to Lake Champlain, and thence to tide water in the Hudson River. The company asking the charter is said to have been at work for three years on the project, owns a valuable franchise for a ship canal from Lake Erie to the ocean, via Montreal, has spent over $200,000 in surveys and preliminary work, and owns the patents on the great Dutton pneumatic locks, the first of which is now going in at Lockport, on the Erie Canal, to take the place, in one lift, of all the locks at that point.

It is said that the promoters have found that the route from Lake Ontario down the St. Lawrence, nearly to the forty-fifth parallel, and thence to Lake Champlain, all on American soil, is entirely feasible, and, using the pneumatic lock, can be constructed for about 60 per cent of the estimates hitherto made for other plans of getting down to the level of the Hudson River.

The charter provides that for all its canals, locks, and works there shall never be issued more than $200,000,000 of bonds, preferred stock, and debentures; that no more than 5 per cent shall be paid thereon, but that tolls shall be steadily reduced so as to keep the dividends and payments within that sum; that work shall commence within three and be completed within ten years, and that its terms having been complied with, the instrument shall continue in force forever, unless the property shall be assumed by the government for the free use of the public.

American Men of Science Honored.

Emperor William and the Empress were present January 5 at the celebration of the centenary of the Institute. The American professors Simon Newcomb, Alexander Agassiz and Henry A. Rowland were created officers and Adolphus Hall a chevalier of the Legion. All are corresponding members of the Academy of Sciences.

Correspondence.

Gluing Belts.

To the Editor of the SCIENTIFIC AMERICAN:

In the SCIENTIFIC AMERICAN of February 1, 1896, is an article on "Glue Joints in Belts."

I heartily agree with your correspondent in regard to rivets being a nuisance and of no use whatever in a properly glued belt.

I have glued a great many belts for the last thirteen years, and, to my mind, it is the only proper way to join a belt.

In the room that I have charge of there are eighteen machines (wood working), and for the past seven years there has not been bought or used a single hide of string leather and but a few papers of belt hooks.

We keep three or four belts of different widths to hook on, if a belt breaks on a machine that cannot be spared long enough for glue to dry, and then about night glue on the belt that belongs on and let it dry overnight, and it is ready to use in the morning. If we wish to take up or tighten a belt, we do it just before night and let it dry overnight.

A good quality of common glue is just as good as any cement you can make, and, if properly done, will last for months, and sometimes many years, and can hardly be got apart to tighten.

I have used them on tenoning machines where hooks or string lacing would not last but a few days, but the glue joint would wear several months.

Our modus operandi is this: Allow about eight inches for lap, smooth with a plane each end, or scarf off with a scraper until the lap would be the same thickness as the rest of belt and then roughen the surface with an old hand saw, or some similar tool, so the glue will take hold of the fiber or grain of the leather; then take a piece of board two feet long with straight edge, and nail each end of belt to board nails near the end of board, so that lap comes about the middle and edge of belt on straight edge of board, to keep the belt straight. Put a piece of paper between board and belt to keep belt from sticking to board by surplus glue. Apply thin hot glue (well cooked) to both surfaces that come together and be quick about it, so glue won't get cold, rubbing and pounding out all surplus glue until well stuck down, and let stand until morning. Then take it off board and trim, and it is ready for use.

If a belt is greasy, take ammonia water and rub lap with that and let it dry before gluing.

A belt put together this way will run smooth and draw steady and does not pound out the Babbitt boxes as lacing and hooking does, and, under all ordinary usage, will last longer than any other joint I know of.

Your paper is a welcome weekly visitor at my house. I have taken it for about twenty years.

Oswego, N. Y. B. M. GUNSTON.

Cause of Variation in the Velocity of Wind.

To the Editor of the SCIENTIFIC AMERICAN:

I wish, if possible, you would answer me the following questions. Being somewhat interested in meteorological observations, I would like to know the causes of the following: We have a storm, wind blows northeast brisk to high. As storm travels on over, wind comes out of northwest; weather clears. Now, northwest wind blows a gale all day, and when night comes wind falls with the sun, and does not blow through night more than five or six miles; but when sun rises the wind also rises, and blows a gale once more, and will act this way for three or four days. Now, if the storm continues which is still traveling north of us, why don't wind gradually decrease? Why does wind blow high in day, not at night? C. L. H.

Long Branch, N. J.

[Answer by the U. S. Weather Bureau: In reply to your letter of the 11th instant requesting an explanation of the fact observed by your Long Branch correspondent, I have the honor to inform you as follows:

On land surfaces at sea level the wind attains its greatest velocity during the heated portion of the day—from 10 a. m. to 2 p. m.—and then diminishes in velocity until the minimum is reached about midnight. This condition does not prevail, however, at an elevation of 4,000 feet and upward, as has been conclusively shown by direct observations of the velocity of the wind on mountain peaks, and also of cloud motions in the free air. The maximum velocity of the wind at Pike's Peak, Colorado, elevation 14,134 feet, occurs from 2 to 4 a. m. and the minimum from 11 a.m. to 1 p. m. The decrease in the velocity of horizontal currents at a considerable elevation during the warmer hours of the day is ascribed to the interference of ascensional currents set in motion by the insolation of day time; and the greater the inertia of these ascending columns, the greater will be the frictional resistance to the steady motion of the horizontal currents. It also follows that when the upward motion of the lower warmed air is greatest, the surface velocity is also at its maximum, being the effect of the observed surface barometric gradient and the interchange of the faster moving upper currents with the surface currents. On the other hand, when the effect of the sun's rays is no longer felt and the surface air begins to cool by radiation, there is more or less stagnation in the surface air, although the upper currents move with slightly increased velocity.

WILLIS L. MOORE, Chief of Bureau.]

Electric Light Dangers.

London oculists are up in arms against the very serious danger to the community caused by the electric light. Several eminent eye doctors are agreed on the point that unless a stop is put to the exposure of uncovered electric lights in the streets and in shops and offices nearly all the population will become blind. Experts are so greatly exercised in the matter that they even suggest that Parliament should take it up, and prohibit the use of plain glass globes for electric lights unless they are properly shaded

Commenting on this, a London electrical journal says: "It is not customary to look at the sun, and not even the most enthusiastic electrician would suggest that naked arcs and incandescent filaments were objects to be gazed at without limit. But naked arc lights are not usually placed so as to come within the line of sight, and when they do so accidentally, whatever may result, the injury to the eye is quite perceptible. The filament of a glow lamp, on the other hand, is most likely to meet the eye, but a frosted bulb is an extremely simple and common way of entirely getting over that difficulty. The whole trouble can be easily remedied by the use of properly frosted or colored glass globes. In any case, however, the actual permanent injury to the eye by the glowing filament is no greater than that due to an ordinary gas flame."

The Demolition of a Large Mill Chimney.

The Engineer of recent date contains an interesting description of the demolition of a chimney at Manchester, England. The chimney was 270 feet in height; each of the eight sides of it were 11 feet 4 inches wide. The chimney had a taper of ⅝ of an inch to the yard. The foundations were nearly 25 feet deep, and over 1,100,000 brick were used in the construction of the chimney, which was 28 years old. The estimated weight was 4,000 tons. The owners of the chimney having sold the property, it became necessary to remove it, and it was bought as old building material.

There was an inside brick lining to the chimney, and the inner and outer walls were tied together by eight midfeathers. There was a lean of over 2 feet, in a northerly direction, still it was not considered that it was unsafe. The purchasers of the chimney engaged an experienced rigger to raze it. He caused a portion of the base on five sides (east, south and west) to be cut away for 5 feet 6 inches in height, and as the cutting away of the brickwork proceeded, timber lintels or carriers were inserted, wedges being used to pack up the bricks, which was a difficult operation, considering that the thickness was 7 feet 6 inches. The timbers were perforated for the reception of resin and other inflammable substances to insure quick combustion. When this work was completed, the spaces between the uprights were filled with shavings, pieces of wood, coal tar, pitch, etc., and over this was poured a considerable quantity of creosote and paraffine oil. On the afternoon of February 13, in the presence of thousands of spectators, a light was applied to the inflammable material. Large bodies of flame shot up and smoke poured out of the top of the chimney and from cracks in it. The fire continued with great fury and was fed in places where it was desired to more quickly destroy the timber, with paraffine oil. The stack leaned over to the south and had not gone far out of the perpendicular when the portion near the base dropped into itself, and the support being thus removed the remainder of the structure literally collapsed in telescopic form and fell in a southerly direction. The debris covered an area 75 feet long by 40 feet wide. The time occupied in the destruction of the timber supports, that is, the time of the lighting of the timber to the fall, was only seven minutes. Little noise was heard when the stack was falling, but a considerable shock was experienced when the heavy mass fell on the ground. Two tons of coal, a barrel of creosote, 2 barrels of paraffine oil and 350 cubic feet of timber were used in the destruction of the chimney. The result of this method of demolishing the chimney is regarded as very satisfactory.

HORSE POWER OF A LIGHTNING STROKE.—At Klausthal, in Germany, according to Machinery, a lightning stroke struck the wooden post of a house, and fused two nails four millimeters thick. Messrs. Siemens & Halske, of Berlin, afterward carried on a series of experiments to ascertain the force required to melt this quantity of iron. Assuming one second as the time standard, it required a current of 200 amperes and 20,000 volts, representing 7,000 horse power. Assuming that the lightning occupied one-tenth of a second to fuse the two nails, the horse power required would be 70,000.