ELECTRIC MOTOR ON THE NEW YORK ELEVATED R.R.

(*Continued from first page*).

the electro-dynamic machine. The object of using these laminated cushions is to avoid the too considerable motion which would result from the use of the ordinary springs, and at the same time provide a degree of resilience which enables the machine to run over very rough roads without the least derangement of parts.

The cab contains also a voltmeter, which shows the engineer the difference of potential on the track, just as the ordinary pressure gauge now indicates the pressure in a boiler.

The rails are the ordinary 56 pound steel rail, insulated by means of the Daft insulator, which consists of an umbrella of cast iron with head so formed as to readily admit of locking the base of the rail by means of two cap screws and washers. The standard is formed of any suitable insulating material; the standard now in use on the elevated road consists merely of baked hard wood saturated with asphaltum, which has so far been found to afford ample insulation for all practical purposes — the leakage with four miles of track now involved (two miles of double track), plus the switches, being inconsiderable. The joints are made by drilling holes in the web of the rail, and riveting strips of copper from one to the other; this method has been found entirely satisfactory, both here and on the road now in operation in Baltimore—the resistance having thus been reduced to nearly the calculated line resistance.

No difficulty has been experienced in making the switches, though in some instances a considerable interval has to be bridged by momentum alone, due to the necessity for leaving out the third rail in order to permit the passage of the ordinary steam locomotives; this difficulty would of course be removed in the event of the entire road being operated electrically. The maximum gradient is one of 105 feet per mile between 23d and 34th Streets. This has been surmounted with ease with fairly well loaded trains, and on several occasions an average speed of 20 miles an hour has been attained.

The track is vitalized by dynamos (Fig. 1) situated at the main station on 15th Street, about 200 yards from the track, it having been considered desirable to place the vitalizing machines as near one end of the track as possible, so as to show the influence of distance in lowering the potential.

The effect of these two miles is, therefore, rendered equal to four miles where the station is centrally placed, and the loss of energy at the extreme end is barely observable. The vitalizing system at the station consists of three No. 5 Daft dynamos, actuated by a Wright automatic cut-off steam engine, having a cylinder 18 x 42 inches and a flywheel 16 feet by 26 inches. There is, in addition, a small arc-light Daft dynamo used for lighting the station and boiler room. The machines are connected with a switchboard, so that they can be placed in "parallel" or "series," as may be desired, and there is in addition an automatic cut-off, which operates in the event of a short circuit on the track, so as to open the circuit at a fixed point, and at the same time give the engineer notice by ringing an alarm. There is also an attachment to indicate when the short circuit is removed. The machines are connected to the track by means of 0000 copper wire, with Underwriter's line insulation suspended upon poles.

The motor has already run several hundred miles on the short track at 14th Street, making many hundred stops and starts, involving much severe work, hauling four cars for a considerable portion of the time, and also a two car train, for the purpose of making close observations as to the difference in consumption of fuel. With regard to this all-important question, the tests are as yet necessarily incomplete; but so far as they have gone, the indications are claimed to be eminently satisfactory. The extraordinary adhesive properties of a locomotive operated in this manner are evident. This feature is well illustrated on the line in Baltimore, which at one point has a curve of 75 feet radius on a gradient of 353 feet, and yet no difficulty has been experienced by the motor in ascending this grade with a loaded train. So successful has been the working of the Baltimore road that two more motors have been ordered, making a total of four.

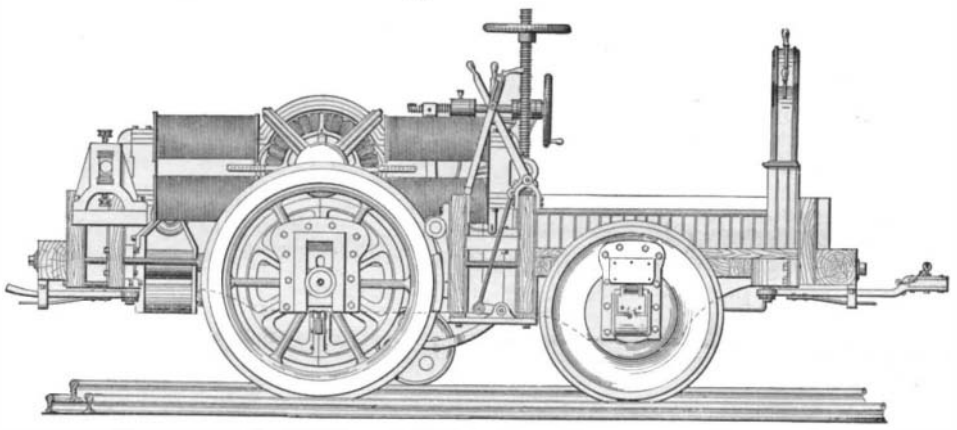


Fig. 3.—SIDE ELEVATION OF THE ELECTRIC MOTOR

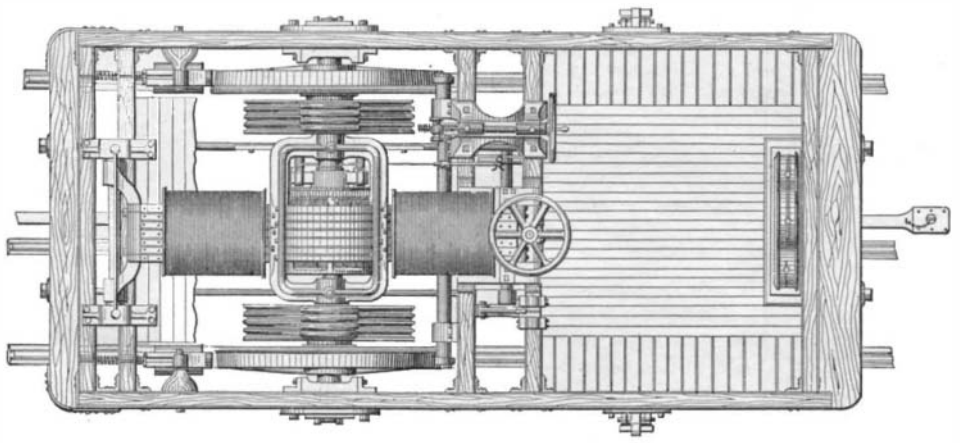
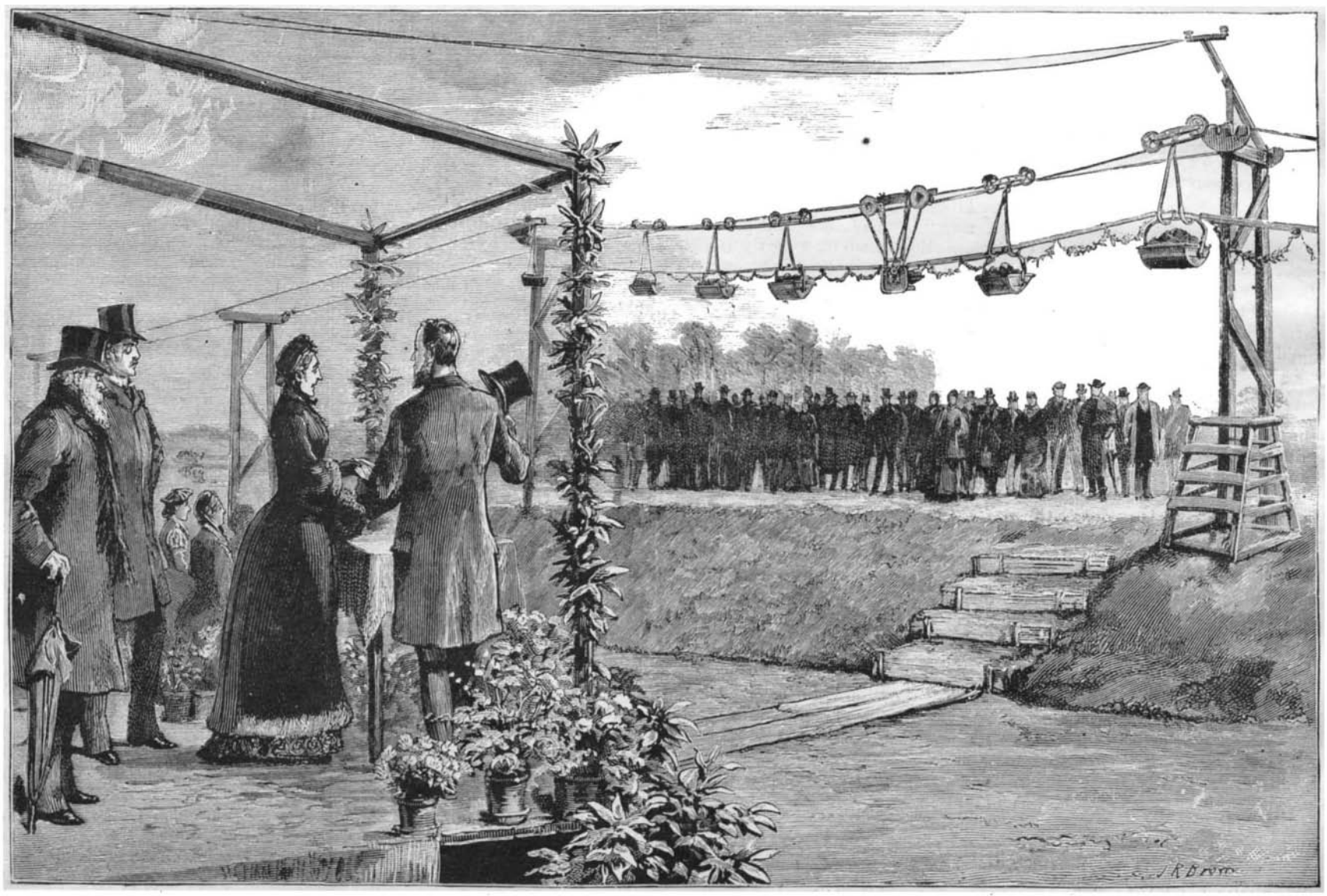


Fig. 4.—PLAN VIEW OF THE ELECTRIC MOTOR.

OPENING OF A TELPHER LINE.

The experimental telpher line at Weston, under the system of the late Professor Fleeming Jenkin, has resulted in the construction of a telpher line to do real work at Glynde, on the estate of Lord Hampden, near Lewes. Professor Fleeming Jenkin had begun the construction of the Glynde line, Mr. Arthur Brewtnall being his assistant. After the death of Professor Fleeming Jenkin in June last, Professor Perry was appointed his successor as the engineer to the Telpherage Company. The Glynde line has now been completed, and was opened October 17th, by Lady Hampden, who started a loaded train on the line electrically. The line is a double one, nearly a mile in length, and is composed of two sets of steel rods, ¾ inch in diameter, supported on wooden posts of T shape, and about 18 feet high. The wires are supported one on either end of the cross piece of the T, which is 8 feet long. The carriers, or skips, as they are technically termed, are iron



OPENING OF AN ELECTRICAL CABLE RAILWAY OR TELFER LINE AT GLYNDE, ENG.

trough-shaped buckets, each holding about 2 cwt., and suspended from the line by a light iron frame, at the upper end of which is a pair of grooved wheels running on the line of rods. A train is made up of ten of these skips, which are in electrical connection with each other and with an electrical motor, which is placed in the middle of the train, having five skips in front of and five behind it; the dynamo machine used as the motor is of Reckenzaun's design. At a point about midway of the length of the line is the engine house, in which is a steam engine for driving the dynamo machines. From these latter the current is led to the line, and thus to the electrical motor which moves the train. The use to which the line is put is to carry clay from a pit to the Glynde railway siding, whence it is delivered into trucks and transported by rail to the works of the New Haven Cement Company. At the charging end of the telpher line, the skips are loaded each with about 2 cwt. of clay, the train thus carrying 1 ton. A laborer, by touching a key, starts the train, which travels at a speed of from four to five miles an hour along the overhead line to the Glynde station. Arrived there, another laborer upsets each skip as it passes over a railway truck, into which the clay is thus loaded. This upsetting, however, will eventually be performed automatically by means of a lever on each skip, which will come in contact with a projecting arm as it passes over the truck.

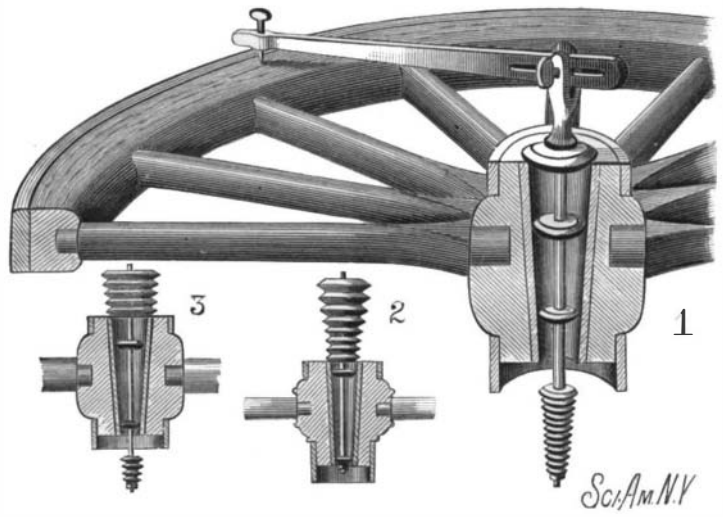
The laborer at the discharging end of the line has full control over the train, and can stop, start, and reverse it at will, as can also the man at the other or loading end. There are two trains at Glynde, but only one is at present used, that being found sufficient to deliver 150 tons of clay per week at the station. The trains need no attention when running, as they are governed to run at the same speed both on rising and falling gradients. An automatic block system is provided, so that as many as twenty trains can be run on the line without the possibility of collision. The telpherage line at Glynde being the first erected is still capable of improvement in detail, but it successfully demonstrates Jenkin's proposals for working the equivalent of a wire rope railway by electricity instead of by the teledynamic system of Hirn and others, although time is necessary to prove its comparative practical utility and efficiency. Our engraving is from the London *Graphic*. A more detailed description of this system, with several engravings, will be found in SCIENTIFIC AMERICAN SUPPLEMENT, No. 420.

CLAY'S IMPROVED SPLIT LINK.

ONE and three-fifths seconds after the gong struck was the time achieved by one of the steam fire engine companies in harnessing up and starting, at the recent horse show in New York.

HUB-BOXING GAUGE.

By means of this gauge the wheelwright is enabled to quickly and accurately center the box in the wheel. Upon a rod provided near its upper end with a fixed collar, and at its lower end with a nut, are rings, which are made successively smaller in diameter toward the lower end. The top of the rod is held by a set screw to the slotted end of a gauge arm; the slot allows the rod to be set nearer to or farther from the marker at the other end of the arm, to suit wheels of different diameters. The form of the gauge rings or collars is clearly shown in the cut. To use the gauge, the rod with the rings is passed into the hub-box, when two or more of the rings will bind against the tapering inner wall of the box, to form a true bearing for the rod at the exact center of the box; the gauge arm is then set so that the marker will stand at about the joint of the felly with the tire. The rod and arm may be together turned around the wheel, so that the indicator will show at the periphery whether the box stands precisely at the center or not.



MATERN'S READY HUB-BOXING GAUGE.

By providing the rod with a sufficient number of rings, one gauge may be used for almost auy ordinary size of wheel.

Fig. 1 shows the gauge applied to a large size box, Fig. 3 to a medium, and Fig. 2 to a small box.

This invention has been patented by Mr. William J. Matern, of Bloomington, Illinois.

Water is Fattening.

It has been observed that water is fattening, that those who drink large quantities of water have a tendency to fullness and rotundity. That there is considerable truth in this observation the *Medical and Surgical Reporter* fully substantiates. That excessive imbibition of very cold (iced) water (especially when one is very warm) is not to be commended, yet we have reason to believe that the *unlimited* use of *pure spring water*, at its natural temperature, is not only very conducive to health, but has an actual tendency to favor a fullness and roundness of body. Whether this is the result of a better action on the part of the digestive, assimilative, and depurative functions, owing to the internal cleanliness or flushing of the human sewers produced by large quantities of water, or whether water has some specific action in producing this fullness, we do not know, neither does it signify, since observation confirms as a fact that the free use of water does have this effect.

British Shipbuilding.

Recurring to the subject of depression in the shipping trade, the London *Times* says that in 1884 the result was more unsatisfactory than at any year previously. The tonnage of iron vessels built in 1884 at Tyne, Wear, West Hartlepool, the Tees, Blyth, and Whitby included, amounted to 297,000, or less than one-half the total of 1883. It is added that elsewhere the falling off is equally pronounced. At this time not one-half the building berths at the northern shipyards are employed. Thousands of workmen have been thrown out of work at the shipyards and iron and steel works, and "a correspondent thinks" that the approaching winter will witness a still further depression and distress.

IMPROVED SPLIT LINK.

The link is composed of two parts hinged together. Each part is made of half-round iron, and is formed with an opening and enlargement. The enlargements are so located in relation to the openings as to close the latter, and form a complete and continuous link when the parts are closed, as shown in the lower figure. A cut-away place in each half forms, when the parts are closed, a recess, so that a nail or other small object may be easily inserted between the parts of the link, for forcing it open in case it should not work easily at the hinge. In one form of link, the ends at the openings are oppositely beveled to fit the beveled ends of the enlargements, so that tight joints will be formed when the link is closed; in this form, corresponding projections, formed on the parts, are fashioned into the hinge. In the form shown in the engraving, the hinge is formed in the material composing the body of the link, and the ends of the openings are cut at an opposite, to fit the diagonal ends of the projections, so that the latter prevent lateral movement of the parts upon each, thereby preventing strain upon the hinge. With the form of construction the little fins of metal which always form at the inner edges of the link, in the use and wear thereof, in no way interfere with the opening of the link, as such fins do with links that open and close edgewise with the parts sliding upon each other.

Further information concerning this invention can be had from the patentee, Mr. Wm. H. Clay, of Paris, Kentucky.

BUTTONHOLE CUTTER.

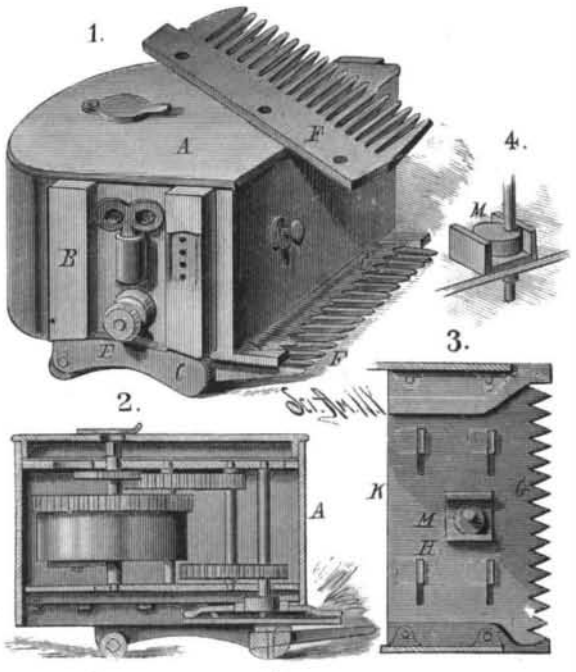
The buttonhole scissors shown in the cut are so constructed that they can be adjusted very easily for buttonholes of a certain size. Each blade is formed with a notch or recess, which constitute the cutting parts. One blade is provided, adjacent to the diagonal edge (each blade has a diagonal edge formed on the rear part of the blade proper) of the other, with a button having a pin mounted to turn in the blade and a handle wing. The button is eccentric in relation to its pivot, and its rim is made polygonal. When the button is in its normal position, its long, straight side comes in contact with the diagonal edge of the other blade. It will be seen that by properly adjusting the button, the cutting edges of the blades may be made to overlap more or less, and buttonholes of different sizes may be cut.

RODER'S BUTTONHOLE CUTTER.

This invention has been patented by Mr. C. A. Roder. Particulars can be had by addressing Messrs. Herman Boker & Co., of 101 and 103 Duane Street, New York city.

HAIR CUTTING MACHINE.

We illustrate a hair cutting machine, patented by Mr. Vladimir S. Bekofsky, of Jenchuan, Corea, which is operated by clockwork, and after winding needs no attention from the operator, other than to be passed over the hair to be cut. Fig. 1 shows a perspective view of the machine, with an extra comb lying on top of the case, Fig. 2 a cross sectional elevation, Fig. 3 a top view of the upper cutting plate, and Fig. 4 a perspective view of the eccentric driving mechanism. A metal box, A, has two upright guides, B, on each end, in which legs projecting from the crosspiece, C, slide up and down. These legs are provided with a series of apertures, as shown by the break in one of the guides, for receiving pins projecting through the box, from the free ends of an interior spring, operated by the push button, E. A comb, F, is secured to the front of the crosspiece, C. Two knife blades are shown immediately above the comb, the upper one of which, G, is provided with longitudinal slots to receive the prongs, H, on the lower plate, K. On the upper plate there are two upwardly projecting lugs, between which an eccentric disk, M, is located, which is mounted on an upright shaft actuated directly from the clockwork. The plate, G, is convex, as shown in cross section, so that only its front teeth and rear edge are in contact with the under plate. Immediately above the push button, E, there is a pocket for holding a key for winding up the clockwork. When the machine is not in use, the mechanism is prevented from operating by a brake lever connected with a push button on the front of the metal box. In operation the button is pressed inward to relieve the clock fan and permit it to rotate. If the hair is to be cut very short, the comb is adjusted as shown, but when it is desired to leave a greater length of hair, the comb is adjusted further from the cutting plates by lowering the crosspieces, C. The machine will be found a great convenience, and will effect a considerable saving of time.



BEKOFSKY'S HAIR CUTTING MACHINE.