

meter is left at some point of the circuit to be adjusted, for twenty-four hours. This is repeated at different points of the same circuit. The adjustments should be checked once a month.

43. The main switchboard situated in the central station consists of thirty four marble panels set side by side in a framework of angle steel fastened to the stonework of the building. This frame stands at least six feet from the wall, and is supported by soft rubber discs set into iron rings fastened to the floor. These discs have the effect of taking up the vibrations of the floor, and prevent their being communicated to the instruments above. The switchboard is 57 feet long and nine feet in height.

44. There are eight dynamo panels similar to those in the other stations and already described, six for the alternators in this building, and two spare ones.

45. Five motor panels that contain Weston illuminated diavoltmeter, Weston edgewise ampere meters, Westinghouse circuit breakers, ground detector, and jaw switches, through which all the motor circuits and D. C. generators are interchangeable.

46. The twenty feeder panels contain Westinghouse pendulum voltmeters, ampere meters and compensators, throw-over switches, and panels for plug and cable connection with twelve pairs of bus bars and combination switches and fuse blocks, as already described.

47. These twenty panels are divided into two sections of ten, between which a special panel is set up, containing a clock, a ground detector and switch, and other special devices.

48. Directly in front of each section of feeder panels and four feet away from them, stands a table made up of an iron frame work with sides of wire netting and plate glass top set in a polished brass frame. Each of these tables contains ten regulators or "boosters," with a range of 20 per cent. up or down. Each circuit can thus be regulated independently.

49. The attendant at this switchboard controls the whole system. He is also in communication with the attendants at substations and the station superintendent's residence by a private telephone line.

50. For economy in line construction it was decided not to extend the 250-volt motor system except for units of one h. p. or less, and to merge it and the 500-volt service into one single three-wire distribution. The 100 h. p. motor in the flour mill is, however, on a separate circuit, and may, if desired, be run independently of the others. The three wire system is supplied by two of the 250-volt 60 h. p. generators in series, and the 500-volt 250 h. p. generator connected to the + and - wires. The brushes of the 250-volt machines on the + side and the + brush of the 500-volt machine, may be connected together for equalizing purposes. All the D. C. generators are interchangeable through the switchboard.

51. It was found necessary to almost completely reconstruct the motor circuits. Four pairs of +0000 feeders were strung up. As the joints in wire of that size are extremely unsightly a portable welder was constructed for welding the lengths of wire together. A large regulator core was fitted with a primary coil of 388 turns, and a secondary coil of a single turn made up of 12 No. 0000 wires upon the ends of which massive metal jaws were shrunk. These jaws normally stand about four inches apart, but may be pressed closer together by an insulating clamp and screw, the elasticity of the secondary coil causing the jaws to resume their normal position when released. The current is regulated by a T H reactive coil. This apparatus may be attached to any converter on the line as required.

52. Several of the T S dynamos in use for lighting up to 188y have been put in service as motors, two of them running elevators very successfully.

53. The company has lately made what is believed to be an innovation in providing in its office, which is open day and night, a locker with a glass front in which are displayed rubber coats, gloves and shoes. This in addition to the rubber gloves regularly supplied to the linemen. The key of this locker hangs within a little box behind a glass which is to be broken, in case of accident, by anyone requiring the clothing.

### THE BALL NOZZLE "MYSTERY."

Editor CANADIAN ENGINEER:

A correspondent of the *Scientific American*, on the ball nozzle mystery, in last number, page 218, Oct. 5, is right, and the editor wrong. Why does the editor of that paper persist in ignoring my true explanation of the so-called mystery as published in your May (I believe) number last?

C. BAILLAIRGE.

City Engineer's office, Quebec, 1st Nov., 1895.

### USES OF PLUMBAGO.

The use of plumbago in mechanics continues to develop. Originally used for crucible manufacture and as a dry finish or polish its use later led to a marked advance in our wheel grease. Eventually it found its way into the iron foundries as a facing powder next the self lubricating journals marked it a true friend and economiser. Now we have it brought before us as a rust preventer and general preserver of iron surfaces, in which capacity the discussions in the American Painters' Associations show that it far exceeds red lead and iron oxide. Not only does it give a smooth finish fit for a yacht bottom, and slips on with very little brushing effort, but being an inert substance, it is quite unaffected by heat or frost, rain or shine, acid or alkali. It has besides the essential advantage of being cheap.

Its uses are not yet exhausted. Why, for example, should it not be more generally used in packing, if all that is here claimed for it is confirmed, and so far it has never failed. The 'Diamond Graphite' is indigenous to Eastern Canada and is already making its way for extensive use in England and the United States. It is recommended in our advertising columns under the name of 'Diamond Graphite' by the Canada Paint Company, who have introduced it into active service in the engineering world for a variety of purposes.

### METAL TRADE REVIEW.

OCTOBER 31, 1895.

Since last month prices in the metal markets have stiffened up considerably, and there is good prospect of a further advance. Prices are now better than they have been for over a year, and as the advance has been indicated for several months, there is every prospect of a continuance of the present firmness. Notwithstanding the stiffness in prices, the volume of business done in the Dominion during the last month has been small; the same may be said of the United States. This probably indicates that the present boom in South Africa is attracting a great output of goods to that country. Current prices are as follows. Summerlee, \$20 to 20.50; Eglinton, \$18.50; America, \$17.50 to 18; Carnbroe, \$18.50; Ferona, \$16.50 to 17; Siemens, No. 1, \$16.50 to 17; wrought scrap, No. 1, \$14.50 to 16; bar iron, \$1.60 to 1.65; tin plate cokes, \$2.90; I. C. charcoal, \$3.25 to 3.71; Canada plates, \$2.10 to 2.25;terne plates, \$5.75 to 6; galvanized iron, 4 to 5c., according to brand, Orford copper, 12½ to 13c.; ingot tin, 16 to 16½c.; lead, \$3.15 to 3.25; spelter, \$4.25; sheet zinc, \$4.50; cut nails, \$2.50, black sheets up to 16 gauge, \$2.30; 17 to 24 gauge, \$2.20; 26 gauge, \$2.30; 28 gauge, \$2.40.

### THE GRIP SOCKET CASE.

Editor CANADIAN ENGINEER:

SIR,—We take pleasure in announcing to our customers, and the trade in general, that letters patent have been issued to us on our grip socket under date of October 15th, 1895. We have defended our right to this patent against the most persistent efforts of another party, who set up an interference, claiming priority of invention, and threatening our customers and ourselves with infringement suits. We have received judgments in our favor in every court of appeal, and the final issuing of the patent to us settles the question of our right to manufacture and sell these grip sockets without let or hindrance, and we stand ready, regardless of expense, to defend our rights to the fullest extent of the law.

CLEVELAND TWIST DRILL Co.,  
Cleveland, O.

### CANADIAN SOCIETY OF CIVIL ENGINEERS.

The first meeting of the above society, since the vacation, was held in their hall on the 10th of October, President T. Monro in the chair. There was a fair attendance. A number of applications for membership were considered, and a committee was appointed to select and report on special themes and subjects for discussion and consideration by the members during the coming winter meetings. A paper by J. G. G. Kerry, A.M., entitled, "Some open questions on the minor problems of railroad building," was read. Another meeting of the society was held on the 24th, President T. Monro in the chair. After the minutes had been read the chairman announced that Mr. Kerry's paper, read at the previous meeting, would be discussed. The paper was dissected item by item, and much praise was accorded Mr. Kerry for the thorough manner in which the details of the paper were explained. The paper was vigorously discussed, the following gentlemen taking part: Prof. Cecil Smith, Messrs. Sproule, Kerry and the chairman.