

To keep such cells in working condition requires much attention, which is partly avoided by the use of a gelatinous electrolyte.

The cells used for such service contain plates 5.9 ins. square and about 0.1 in. thick, placed 0.14 in. apart. A cell containing 29 such plates has a capacity of 160 ampere-hours, the plates weigh 33 lbs. and the cell complete weighs 44.1 lbs. The current during charging should not exceed 15 amperes, nor 20 amperes during discharging. These cells are packed in pairs in wooden boxes provided with handles for easy transportation. These boxes when filled with the cells weigh 97 lbs. and are 14.6 ins. by 10.6 ins. by 11 ins. in size. Each box has a binding post for the negative pole and a short conducting wire which serves as a positive connection. Four such boxes are placed in each car, or rather under it, their total weight with supports and connections being about 530 lbs.

The battery is designed for a maximum duty of 140 ampere hours, which corresponds to the use of 7 amperes for 20 hours; the total capacity, however, is sufficient for a 23 hour run. At the close of this time, the voltage has fallen to 14.8 volts, the lowest permissible amount for the discharge. It materially contributes, however, to the life of the battery if the total charge is not drawn out and 140 ampere hours is accordingly selected as the working limit. The batteries are charged at an electro-motive force of 2.5 volts per cell, or 20 volts for the whole battery. A lamp of 16 candle power is used in each compartment of the car.

A number of roads have begun investigating this system of lighting, among which are the Berlin and Strassburg divisions of the German railroads, the Northeastern Railroad of Switzerland and the Central Railroad of the same country. On one division of the last road, a duty of 14 hours is required. Each wagon uses a 9 ampere current, and the batteries are accordingly called upon to furnish 126 ampere hours. Batteries giving 120 ampere hours were first used but proved inadequate to the demands; and those above described were accordingly adopted and have since proved satisfactory. For lighting baggage cars batteries of 90 ampere hours capacity are used.

TECHNICAL.

Manufacturing and Business.

The Globe Stock Car Co., of Chicago, has been organized by Arthur W. Street, John F. Pershing and John W. Waughon.

The Otis Steel Co., Limited, of Cleveland, O., has removed its New York office from the Union Trust Building to the Mills Building, 15 Broad street.

The Haskin Wood Vulcanizing Co. has been chartered at Alexandria, Va., with T. L. Holbrook, President; Levi Woodbury, Vice-President, and E. L. White, Secretary, all of Washington.

The Western Construction Company was incorporated in Baltimore this week by Alfred E. Hatch, Joseph H. Lawrence, Robert S. Vivian, David J. Reinhart and Charles G. Campbell. The purpose of the company is to construct railroads, water-works, tunnels and bridges.

The Northwestern Equipment Co., manufacturers of the "Kewanee" rectangular brakebeam has just completed its plant at Chicago where it will have a manufacturing capacity of 600 beams a day. The Kewanee brakebeam has been specified on 8,000 cars since January 1, 1892.

The Q. & C. Co. announces that the pamphlet on "Economics in Maintenance of Way," by Benjamin Reece, has been in such demand by railroad officers for distribution among their trackmen that the company has ordered a large second edition and will send copies on application to any officers desiring them. Address the Q. & C. Co., 708 Phenix Building, Chicago.

New Stations and Shops.

The New York, Ontario & Western will build a new wooden station at Liberty, N. Y., the cost of which will be about \$25,000. Other new stations will be built at South Unadilla and Sylvan Beach, N. Y.

The Lake Shore & Michigan Southern has decided to build a handsome new union passenger station at Sandusky, O. The building will be four stories high and the material used will be pressed brick. It is expected that the structure will cost \$100,000 when finished.

President Van Horne, of the Canadian Pacific, when in Winnipeg, Man., last week, said that the company intended to build a handsome station in that city soon, but he declined to state anything about the location of the building or when it would be built.

The Heilmann Electric Railroad System.

The Heilmann electric railroad system, brought out a short time ago abroad, has recently undergone an important modification well worth noticing. Mr. Heilmann's original plan was to fit up every car of his train with an electric motor, taking current from a dynamo in the first car of the train, and thus utilizing the weight of the whole train for adhesion. This arrangement naturally precluded the possibility of easily utilizing the ordinary railroad cars. The necessary changes would have been expensive and troublesome. Mr. Heilmann accordingly has come to the plan of using a regular electric locomotive of suitable adhesive weight for the train. This locomotive will be fitted up with a steam engine and boiler, and dynamo furnishing current to the electric motors with which each of the eight axles will be supplied.

The train itself will be made up in the usual manner, of ordinary cars, in which no changes need be made. A locomotive of this type is now being built for experimental use on the French Government roads, and is designed to develop 480 H. P. The boiler is of the Lentz pattern, which has already been adopted to some extent on the French lines, and the engine will be a horizontal compound one, rated at 600 H. P., working with 180 lbs. steam pressure and at a speed of 300 turns per minute.

Car Heating.

The National Car Heating Co., of Topeka, Kan., and Chicago, issues a circular from Mrs. Julia E. Searle, dated May 21, 1892. Mrs. Searle addresses the manufacturers and users of car heating apparatus, and announces that she has granted to the National Car Heating Co. the exclusive license under the patent of John Q. C. Searle, dated May 10, 1892, No. 474,417. One object of this invention is to provide an apparatus with circulation pipes on both sides of the car, two cross-over pipes, two drums communicating with the circulation pipes and train pipe for supplying steam to heat the circulating liquid and an expansion drum.

A Substitute for India Rubber and Gutta Percha. A new preparation for the purpose of replacing India rubber and gutta percha has been proposed and patented in Europe. A quantity of Manila gum, tempered with benzine, to which is added five per cent. of Auvergne bitumen, also mixed with benzine, is thoroughly mixed. After 48 to 86 hours five per cent. of resin oil is added. The product obtained from this mixture has all the valuable properties of India rubber, including that of vulcanization. Should the product be too fluid, four per cent. of sulphur dissolved in bisulphide of carbon may be added. By adding a small amount of India rubber the mixture is a more suitable compound for certain special purposes.

The Chignecto Railway.

A cable dispatch from London states that a partial resumption of work on this road has been ordered. The work has now been suspended for about six months.

Solidified Petroleum.

The Cleuhall process of solidifying petroleum seems to have overcome many difficulties which have previously interfered with the successful production of a fuel of this kind, judging by recent public tests at the works of the Solidified Petroleum Corporation, England. The cakes remain entirely unaltered by exposure to air, evincing no tendency to reliquefying, even during the process of combustion. They ignite simply by contact with a lighted candle, and the calorific properties are largely in excess of those of an equal weight of coal. A 6-H. P. tubular boiler containing 80 gallons of water was heated by 62 lbs. of the Cleuhall fuel, and in 36½ minutes the steam gauge indicated a pressure of 60 lbs. Afterward, the temperature of the water being 83° F., 90 lbs. of coal, ignited by 14 lbs. of wood and 2 lbs. of shavings, required one hour to produce a steam pressure of 60 lbs. The results of the tests lead to the following comparative values: 1 lb. of solidified petroleum evaporated 13 to 14 lbs. of water, and the consumption per indicated horse power per hour was 1.60 lbs., whereas 1 lb. of the best steam coal evaporated 6.1 lbs. to 7 lbs. of water, the consumption per indicated horse power per hour being 3.10 lbs. It is proposed to erect works for the manufacture of this fuel in the various oil regions of the world, and ship it in its solidified form, which it is claimed will be cheaper and less dangerous, as the cakes are non-volatile and non-explosive. One of the advantageous features of the fuel, as prepared by Mr. John Snell Cleuhall, is that it burns without smoke. The bricks gradually coke, and finally are consumed, leaving a small residue of white ash.

Hydraulic Cement on the Canadian Pacific.

The press dispatches which have said that the Canadian Pacific is about to erect hydraulic cement works at Vancouver, for the purpose of rebuilding all of its docks in beton, appears to be premature at least. The facts are that the company has had a man examining the ground near its line in British Columbia, with a view to establishing cement works to supply its own needs, which will be very large for some years to come. This has not been done with a view to building any large docks or other special works of that character. The cement is required for ordinary railroad works.

The Coupler Gauge.

Mr. A. W. Van Dorston writes that he has received one of the new M. C. B. coupler gauges and tried it on the Van Dorston coupler, made to the improved lines, and that he would ask for nothing better. The committee deserves much credit for the designing of the gauges, and in his judgment the variations are sufficient. The Pratt & Whitney Co. have also done their work well.

Pneumatic Interlocking on the Chicago & North-western.

The Union Switch & Signal Co. has contracted to erect a large number of interlocking and block signals on the Chicago & Northwestern at and near Chicago. The Galena Division of this road runs directly west from Chicago and from this the Milwaukee Division branches to the northward a short distance out from the main passenger station at Wells and Kinzie streets. About 3½ miles from Chicago, on the Milwaukee line, is Clybourne Junction, where another line branches to

the left or northwest. Pneumatic signals are to be erected in connection with all switches, etc., as far as Deering, just beyond Clybourne Junction, and as far as West Fortieth street, on the Galena Division, which is 4.7 miles from Chicago. There will be interlocking towers at five important points, including two draw-bridges and one crossing and at several smaller places, and the intervening road will be equipped with automatic block signals. The total amount of road covered is about 8 miles, and this completes the signaling of the road from the Chicago terminus to the points on the three different lines mentioned, where the Hall automatic signals, referred to in a former issue of this paper, begin. These latter, it will be remembered, extend some 30 miles out on each line.

The Union Switch & Signal Co. is to erect a 32-lever mechanical interlocking machine at the crossing of the Chicago & Alton, the Atchison, Topeka & Santa Fe and the Belt railroads at Lemoyne, near Chicago.

Car Ventilation.

In the *Railroad Gazette*, Nov. 6, 1891, was shown drawings of R. M. Pancoast's improved exhaust and intake for ventilated freight cars. The improved methods have met with such success in this service that Mr. Pancoast is now applying similar methods to passenger-car ventilation. His passenger-car intake separates cinders and rain from the air, without the use of screens or water, by an arrangement of fixed surfaces, which throw off by impact the heavier particles in the air. The intake is at the floor line, and has small but powerful exhausts applied on the outside, between each two clear-story windows. The Car Ventilating Company, of Philadelphia, has control of these devices.

Compound Marine Engines in Canada.

The Polson Iron Works Co., Toronto, has just shipped the compound marine engines built at the works for the Dominion cruiser No. 2, now nearly ready for launching at Owen Sound. The cylinders of this engine are 18 and 36 ins. diameter and 24 ins. stroke. A similar engine is being built for cruiser No. 3.

The Projected Northumberland Straits Tunnel.

The contract for the experimental boring for the proposed tunnel under the Northumberland Straits to connect Prince Edward Island with New Brunswick, has been awarded to McRae & Co., of Ottawa, Can. They have shipped a large outfit, consisting of a diamond drill and other apparatus to be used in the work.

THE SCRAP HEAP.

World's Fair Notes.

The World's Fair directors will have much valuable machinery for the nominal sum of \$1. Many of the large manufacturers want to be represented at the World's Fair, and for advertising purposes are willing to set up costly machinery, grant its use for nearly two years, and remove it at the end of the exhibit for \$1. On this ground there will be retained steam engines of a capacity of 20,000 H. P. The water for fire protection at Jackson Park will be supplied by four Worthington pumps with a total capacity of 40,000 galls. per day.

An electric launch 36 ft. long and 7 ft. beam, and with a seating capacity of about 30 passengers, is being tested on the lagoon at Jackson Park with a view to being adopted for transporting passengers on the waterways at the fair grounds. The motive power is a Jenny motor of five horse power, wound for 100 volts, which at its normal speed of 600 revolutions, drives the launch at a speed exceeding nine miles an hour. The current is supplied from 104 cells of a new type secondary battery. The Columbia Launch Co., of Chicago, built the launch.

The Staten Island Rapid Transit Improvements.

The contract has been let to C. McLane, 415 Broadway, New York, to build the docks, bulkheads and ferry bridges at St. George, Staten Island, in connection with the sea-level improvements to be made at that place, both for the Baltimore & Ohio and Staten Island Rapid Transit roads. There will be 230,000 sq. ft. of dock work, 1,400 sq. ft. of bulkhead and two ferry bridges, etc. The new ferry terminal will be located 360 ft. south of the present one. Connected with the ferry will be a new station, which will be reached by a covered passageway from the ferry, and by an overhead bridge from Jay street. The station will be 60 x 90 ft., and will be built of iron. On each side of the station will be two covered platforms, each 500 ft. long. On the South Island there will be three covered platforms, each 500 ft. long. The triangular space between the tracks leading along the north and south shores will be filled in with platforms to be used in emergencies. Teams and trucks will also reach the ferry without crossing any tracks. Two tracks each for the Baltimore & Ohio, South Beach and Tottenville lines will be built, and a large storage yard containing 25 tracks will be built on the north side of the ferry terminal.

A wooden freight house 300 x 40 ft. will be erected for the South Shore line. On the north side of the ferry slips a covered pier 445 x 125 ft. will be erected, and on the south side a covered pier 480 x 125 ft. Each will have two tracks inside and two outside for lighterage freight. These piers will be numbered 3 and 4 and will be in a direct line with piers 1 and 2. Between piers 3 and 4 a spacious dock of sufficient dimensions to receive ocean liners will be built, so that freight can be transferred directly to and from the cars. On the north side of piers 1 and 2 now built, two open piers will be constructed for storing freight and loading it on lighters. Between these piers three float bridges will be located for handling carload lots for transfer to New York. A coal pier is already built north of the site for the open piers and a second coal pier is to be built. Work on the improvement will probably be begun at once. Further particulars of the plans were published in the *Railroad Gazette* of May 27.

Commissioner Eddy.

The Commission appointed in New South Wales to inquire into the charges of dishonesty brought against Mr. Eddy, the Chief Commissioner of Railways, has decided that the charges are without foundation.