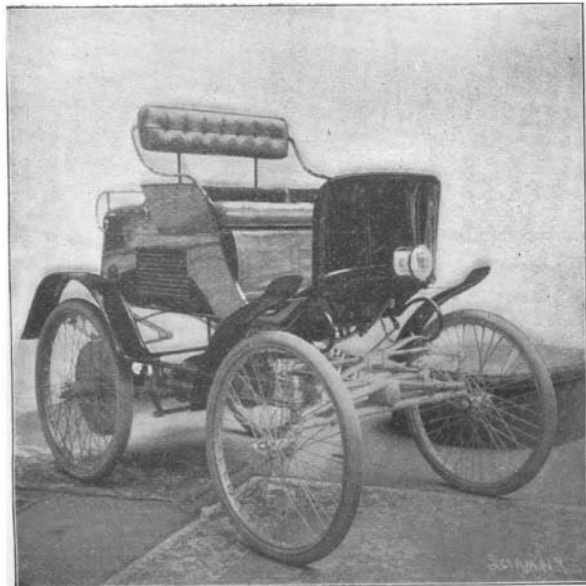


WAVERLY ELECTRIC RUNABOUT AND COLUMBIA ELECTRIC EMERGENCY WAGON.

At the Electrical Exhibition just closed at Madison Square Garden, there were shown several neat-looking electric vehicles by the Indiana Bicycle Company. Among them is an electric runabout designed mainly for two persons, but finished at the back, over the rear extension of the body, with cushions for seating one or two others, intended as an emergency seat. Such construction avoids the over-heavy appearance sometimes noticed in other similar vehicles.

As will be seen in the illustrations, one showing a



THE WAVERLY RUNABOUT.

front and the other a rear view, the framework and running gear is somewhat peculiar, built of steel bicycle tubing on what is called the bridge or truss plan.

The front portion of this double tubing is bolted to the front truss-shaped axle and permits the body to tilt slightly when the vehicle is on a side hill. At each end of the trussed axle are vertical crooked axles bending outward horizontally at their lower ends on which the front wheels run, and connected at the upper ends with the steering rod, which rises through the front part of the carriage, where it is jointed so that the handle may be in a horizontal position. In the rear view it will be observed that the method of applying the power is from a single motor shaft by pinions meshing into two large gear wheels on the main axle covered with metal casing. The motor shaft is hollow and runs through the center of the armature of the motor, and contains within itself differential gear for allowing one wheel to turn faster than the other. The brake band is applied to this motor shaft in a very simple way, and is operated by a small foot lever located near the dashboard.

The controller is under the front seat, and the operating lever is on the left hand side. This is arranged with a movable press button on the end, which, when pressed inward, enables the current to be reversed for backing the vehicle. In addition to the controller there are one or two small resistance coils attached to the underside of the bottom for equalizing the sudden application of the current in starting or in changing the speed.

The storage battery employed is of special construction, made by the company, and yields a good percentage of current put into it. In this vehicle it weighs 500 pounds and has a capacity sufficient to run the vehicle a distance of about 30 miles on a fairly level road. The motor yields 1½ horse power under ordinary circumstances, but will give more when pushed. An electric dash lamp is on the front. This style of vehicle is quite popular in the West and contains the elements of strength, lightness, economy, and capacity.

The large illustration shows a new style of an electric emergency wagon exhibited by the Columbia Automobile Company (formerly the Pope Electric Vehicle Company), built for the Consolidated Traction Company, of Pittsburg, Pa. This vehicle is designed as

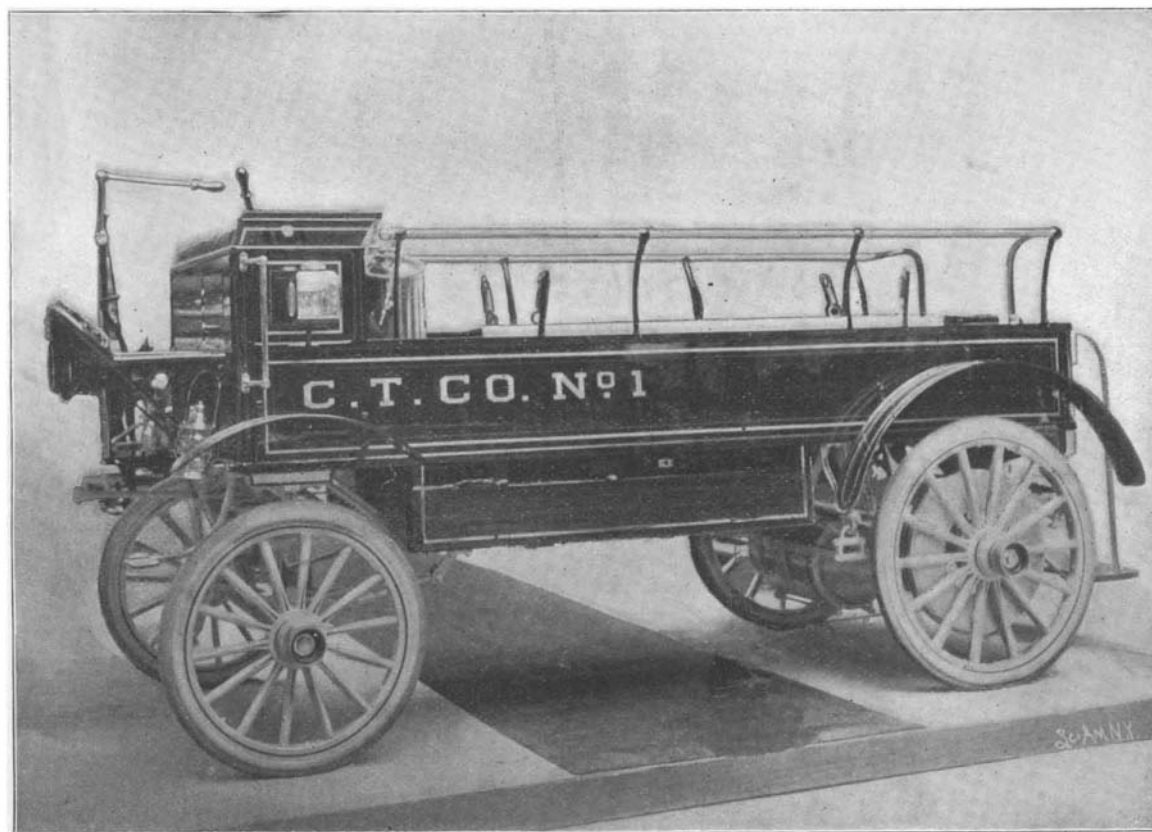
an emergency and repair wagon for street railway service, carrying a crew of four or five men at a speed of ten miles per hour for eighteen miles, this distance, however, being much in excess of the requirements in this particular class of work. It carries a full equipment of all appliances and tools ordinarily required on wagons of this type—fire extinguishers, extension ladders, stretcher, lanterns, and a complete kit of line-men's tools and apparatus. The illustration shows the stretcher hung on springs over the aisle space. The batteries, of the chloride type, weigh 1,400 lbs., and are carried in trays beneath the main body, and are removable at the side. The total weight is 4,500 lbs. Wooden wheels, 42 inches in diameter at the rear and 36 inches at the front, with solid tires, are used.

An interesting feature of the running gear of this vehicle is that no reach connection between the front and rear axles is employed. The place of the reach is taken by a combination of pieces, forming a truss which reaches from the front axle backward and upward against the body, bracing it against direct head-on strains. A single reduction of gearing is used on this wagon. The entire driving mechanism, motor, balance gear, and driving shafts, forms a compact unit which is rigidly held in alignment by the rear axle and rear cross tube. A 5 horse power Westinghouse motor is used. The motor frame is enveloped in a water and dust proof casing covering all parts except the driving pinions, which have a separate housing. The steering lever is mounted just back of the dashboard and operates the front wheels parallel together in the usual way. On the left is the controller lever, and behind the seat will be noticed a fire extinguisher. The body is finished with Tuscan red, black mouldings, gold stripe edged, with fine line of black, fine line of yellow surrounding panels an inch from gold line. The running gear is yellow with black stripe. The wagon can be turned around in 40 feet, which is a comparatively small circle, considering the dimensions, which are width over all 6 feet, length over all 15 feet, height 6 feet 7 inches.

It will evidently be much more economical for trolley companies, having a constant supply of electricity at hand, to possess a vehicle of this character than to maintain a team of horses. It would also be a useful vehicle for small towns to possess where it is desired to establish fire service.

Manufacture of Marmalade in Scotland.

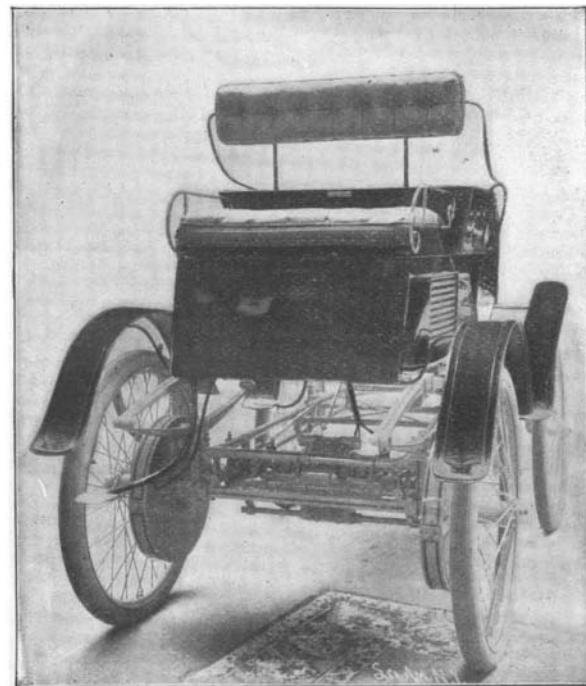
In reply to inquiries by a California company, Consul Higgins, of Dundee, says: The manufacture of marmalade forms a considerable industry in this city. It is made in two kinds, known to the trade as "mar-



AN ELECTRIC EMERGENCY AND REPAIR WAGON.

malade" and "home-made marmalade." In the former case, all the white substance adhering to the skin is retained, while in the quality known as "home-made" this is carefully removed and the outer skin but sparingly used, giving the preserve the appearance of a jelly. The skins are cut in quarters by hand, and par-boiled in barrels arranged in a line and having a steam pipe running along the top, from which branches pass down the center of the barrels. Seeds and fibrous matter are removed by machinery. Bitter oranges only are used, and come from Spain. In the best qualities, pure sugar is used; in the cheaper varieties, inferior sugar mixed with glucose in a proportion varying from 3½ to 7 pounds for every 100 pounds of sugar. The cost of a 15 horse power boiler is \$973. This will supply heat

to six pans, from which 5 or 6 tons a day can be turned out. Jam-boiling pans of 60 pounds pressure cost \$67; of 90 and 120 pounds pressure, \$76 and \$85, respectively. These are of the same size, the additional cost being due to the heavier copper for the high pressure. A small horizontal engine with governor costs \$171; chipping machine for skins, \$124; pulping machine, \$110; machine for "home-made" marmalade, \$124; shafting,



MOTOR AND DRIVING GEAR OF THE WAVERLY ELECTRIC RUNABOUT.

hangers, and drums, \$42. These prices are on board steamer at Dundee.

The June Building Edition.

The SCIENTIFIC AMERICAN Building Edition for June is an unusually attractive number of this interesting periodical. A fine Colonial house at Holyoke, Mass., is the subject of the colored cover. The new Hudson Park in New York city occupies the first page; then follows a selection of houses and churches, accompanied by interior views and plans. The restored Independence Hall, at Philadelphia, makes an excellent page. The literary contents of the number are up to the standard.

The Current Supplement.

The current SUPPLEMENT, No. 1223, has many articles of unusual interest. The front page is taken up by six handsome engravings of "Scenes in Matanzas." The "Relation of External Agents in Plant Reproduction" is a lecture by Stewardson Brown. "Earth Worms" is an article by M. C. Holmes. "The Wehnelt Interrupter for Induction Coils" describes an interesting form of apparatus. "A Thousand Days in the Arctic" is a review of Frederick G. Jackson's experiences in the Arctic regions as leader of the Jackson-Harmsworth expedition. The passage relating to the meeting of Nansen is given in full. Among the other articles are "The Commercial Development of Germany;" "The Progress of Submarine Navigation," with 18 illustrations; "Rapid Blue Print Processes;" "The 'House in the Woods' at The Hague;" and "Enameling as an Industry," complete this very interesting paper.

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