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THE BOYNTON BICYCLE ELECTRIC RAILWAY.

The need of the day is rapid transit. Steam, cable, and trolley cars each in their own degree contribute to this end. The illustrations show one of the last developments in true rapid transit—the Boynton Electric Bicycle Railroad—of which a line is now in process of erection across Long Island, from Bellport to the Sound.

The idea of the bicycle railroad is to provide a system of transit whose speed may be from seventy-five to one hundred or more miles an hour. Air resistance being one of the most adverse factors at this velocity, a car of small cross sectional area is preferable. The inequalities of two parallel lines of rail is also a factor of resistance. In the railroad in question a narrow car with sharpened ends is employed, and is mounted upon two wheels, one at each end, and travels upon a single rail. It has the equilibrium of the bicycle, and like the latter disposes at once of the violent transverse wrenching strains which affect four-wheeled vehicles of the everyday type. It is peculiarly well adapted for electric propulsion, the overhead rail giving a place for the current main.

Referring to our illustration, Fig. 1 represents the plan of the motor car, showing its sharp front and rear ends, and its six compartments, each holding four passengers, who sit back to back. It is proposed in prac-

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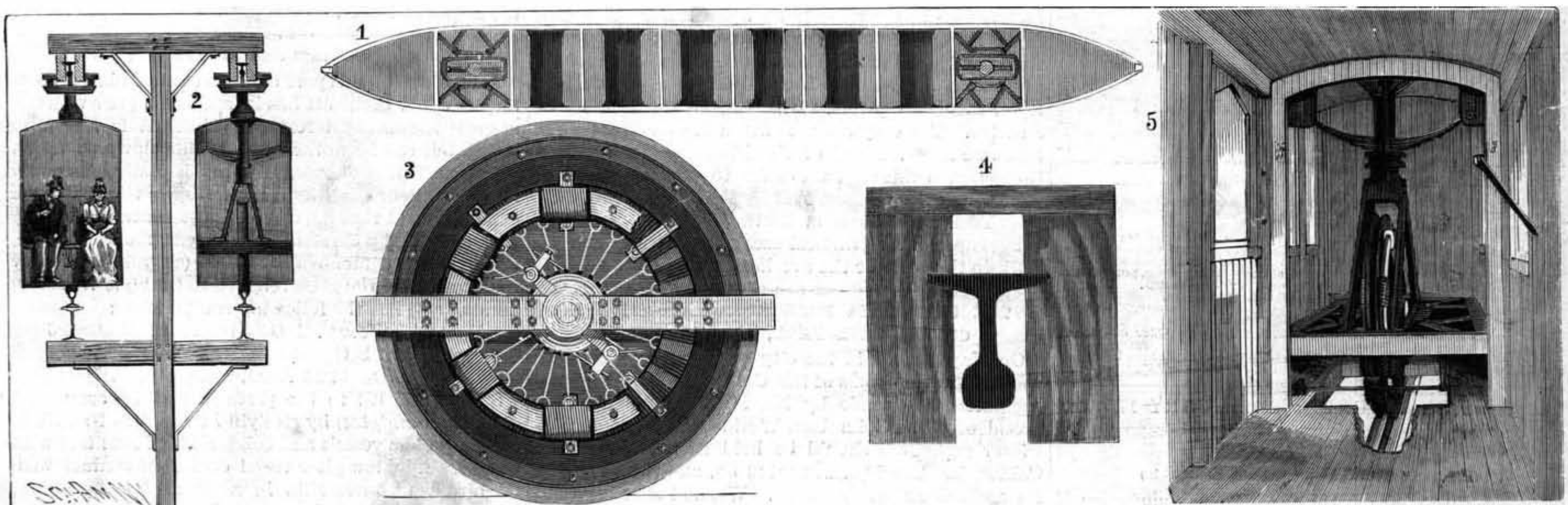
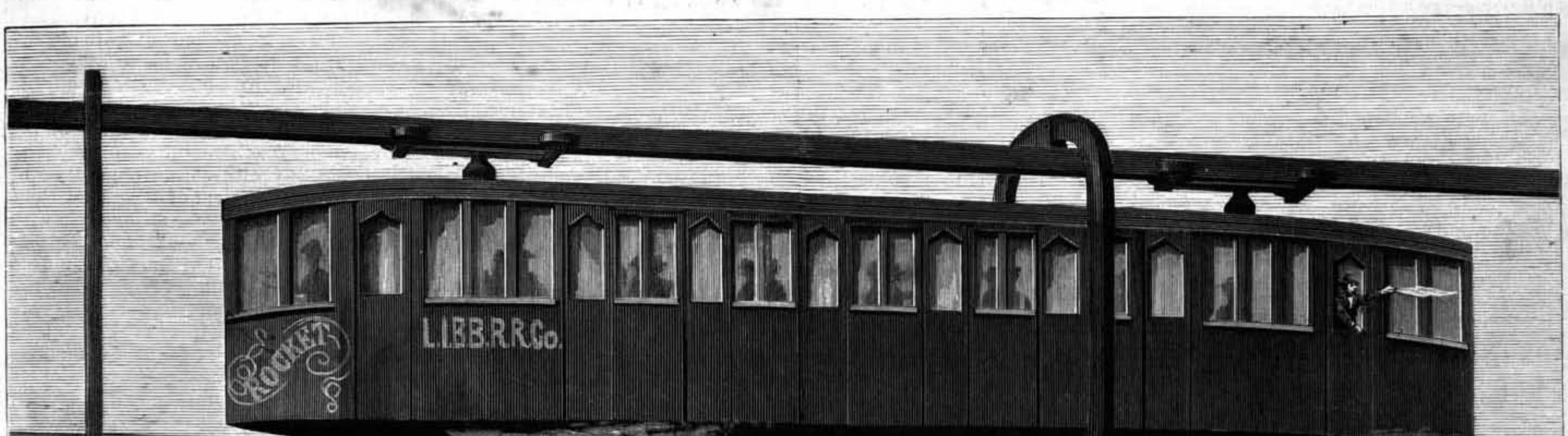


THE BOYNTON BICYCLE RAILROAD—DETAILS OF TRACK, MOTOR, AND CAR CONSTRUCTION.



THE BOYNTON BICYCLE ELEVATED RAILROAD.

THE BOYNTON BICYCLE ELECTRIC RAILWAY.

(*Continued from first page.*)

tice to run trains of mixed trailing and motor cars, vestibuled throughout, with the front end of the front motor car and rear end of the rear motor car sharp. Each compartment has a side door.

The car is carried by two wheels. Each wheel is journaled in a frame at the bottom of a vertical shaft or column rising through the car roof. The upper end of this column carries a frame with four guide wheels, which have vertical axes, and between which is space for the upper guide rails. In passing around curves these four rollers turn the column, so that the axis of the large wheel is always normal to the curve. The wheel has only to turn through a small arc; the opening in the floor of the car is large enough to permit this rotation, and four centering rollers, with horizontal axes, and distributed approximately at right angles to each other about the perimeter of the determined circle, press against bearing pieces, which arrangement keeps the spindle centered at its lower end. The car body swings on springs from the two columns. The springs are fastened near the level of top of the car. Thus the car body can spring up and down without affecting the columns and wheels. This is shown in Figs. 2, 5, and 7.

Fig. 3 is a view of the motor and driving wheel. The motor is of the Gramme type; the field, in part broken away, is seen with four of its coils of wire; back of it is seen the Gramme ring with its connections to the commutator and the brushes. The Gramme ring is bolted to the wheel; the field is carried by the stationary framework. When excited, therefore, the wheel and Gramme ring rotate, the field not moving. A six-pole motor, with armature forty-three inches in diameter, placed on a five-foot wheel, and developing about 75 horse power, is a standard assigned by the inventor, and is employed on the car shown. The torque has a lever arm of about twenty inches.

On reference to Fig. 2, it will be seen that there is an upper rail to act as a conductor for the current. This cut shows also the two horizontal guide wheels which are to bear against the wooden beams between which the current rail is placed. This current rail weighs 12 pounds to the yard and is of 1¼ square inches section. With its casing it is shown in Fig. 4, where also are seen the guide beams.

In Fig. 5 is shown an interior view of the motor compartment, with the wheel and motor, the frame for the same, and the spring bearing for the car body.

Fig. 6 shows the electric plant as at present installed, with the switchboard, steam engine and four-pole 100 H. P. Westinghouse dynamo.

The whole driving structure which we have thus far described is shown in Fig. 7, and after what has been said, the cut will be found self-explanatory. In it is seen the driving wheel with the armature fastened to it, actuated by the field, which is shown in this case placed within the circle of the Gramme ring. The reversing switch and resistance box for controlling the speed are also shown. It will be seen that the current reaches the top rail: thence is taken to the motor by a collector, and passes away therefrom by the bottom rail on the return circuit to the dynamo.

In Fig. 8 is shown a collecting device for taking current from the upper rail. At present frictional shoes are used instead of the brush shown. This shows very distinctly one of the guide wheels. It is an interesting fact that in operation these wheels have very little to do, in many cases light being visible between their periphery and the beam which they are supposed to bear against. It has been found that soft rubber bands sprung around the steel wheels have not worn through with 4,000 miles of travel.

In Fig. 9 is shown the station near Patchogue, L. I., with a car ready to start out on its travels, this time on a surface road. The great cheapness of the construction and the high velocity to be employed has induced the company to feel that an elevated road is the more expedient, and the larger cut shows the ideal elevated bicycle road. The sharp-pointed car carried by two wheels and moving at the rate of 70 to 100 or more miles per hour, abolishing grade crossings and electric trolley wires, here appears in operation.

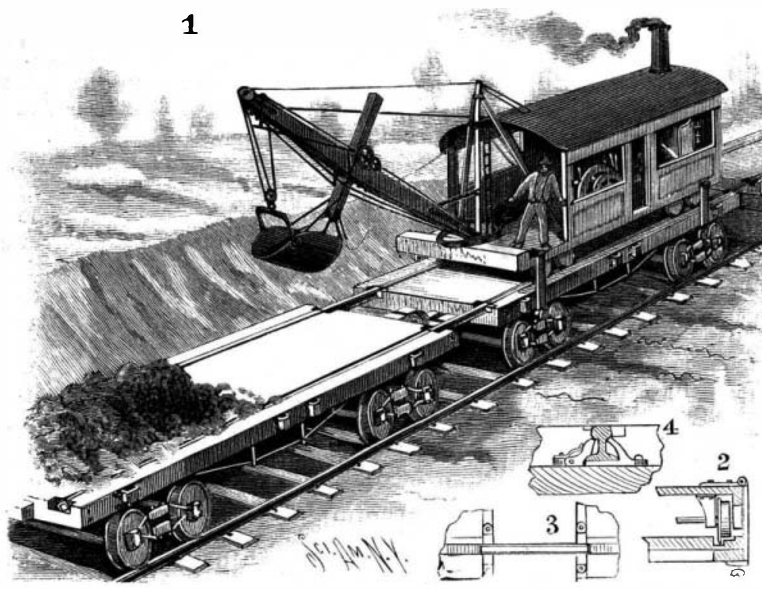
Some of the generalities of the system may be spoken of now. A motor car seating twenty-four people will weigh 6 tons, and the trailing car seating fifty people will weigh half this amount. The cars are 51 feet long, 4 feet wide and 7 feet high. A train of two motor cars with three trailing cars between them, accommodating 200 people, can be built within twenty tons. This is about one-tenth the weight of the Empire State Express, which also seats that number of people.

The maximum curve on the present road is one of nine degrees, and therefore is of only 640 feet radius.

The car in operation runs around this nine degree curve with the greatest ease of motion, the absence of side swaying of the car or passengers being particularly noticeable.

On curves the guide rails are displaced toward the center of curvature, so as to tilt the top of the cars inward. Two feet is the maximum displacement of the upper rails, and is gradually reached before the curve begins, giving a transition curve, so that the car enters the maximum curve with the full inclination. The rule is to give sufficient inclination for the highest speed. The upper rail is so high and the center of gravity so low that the pressure on the guides is very slight. Nine feet now intervenes between the track rail and guide rail.

On the top of the wheel columns is a section of an inverted U beam about four feet long, embracing the guide beam, so that if all the rollers should break, the car will still be maintained in its upright position. A similar arrangement is provided for the supporting wheel, so that if anything breaks, the car end will be carried by a sliding shoe in perfect safety until it stops.



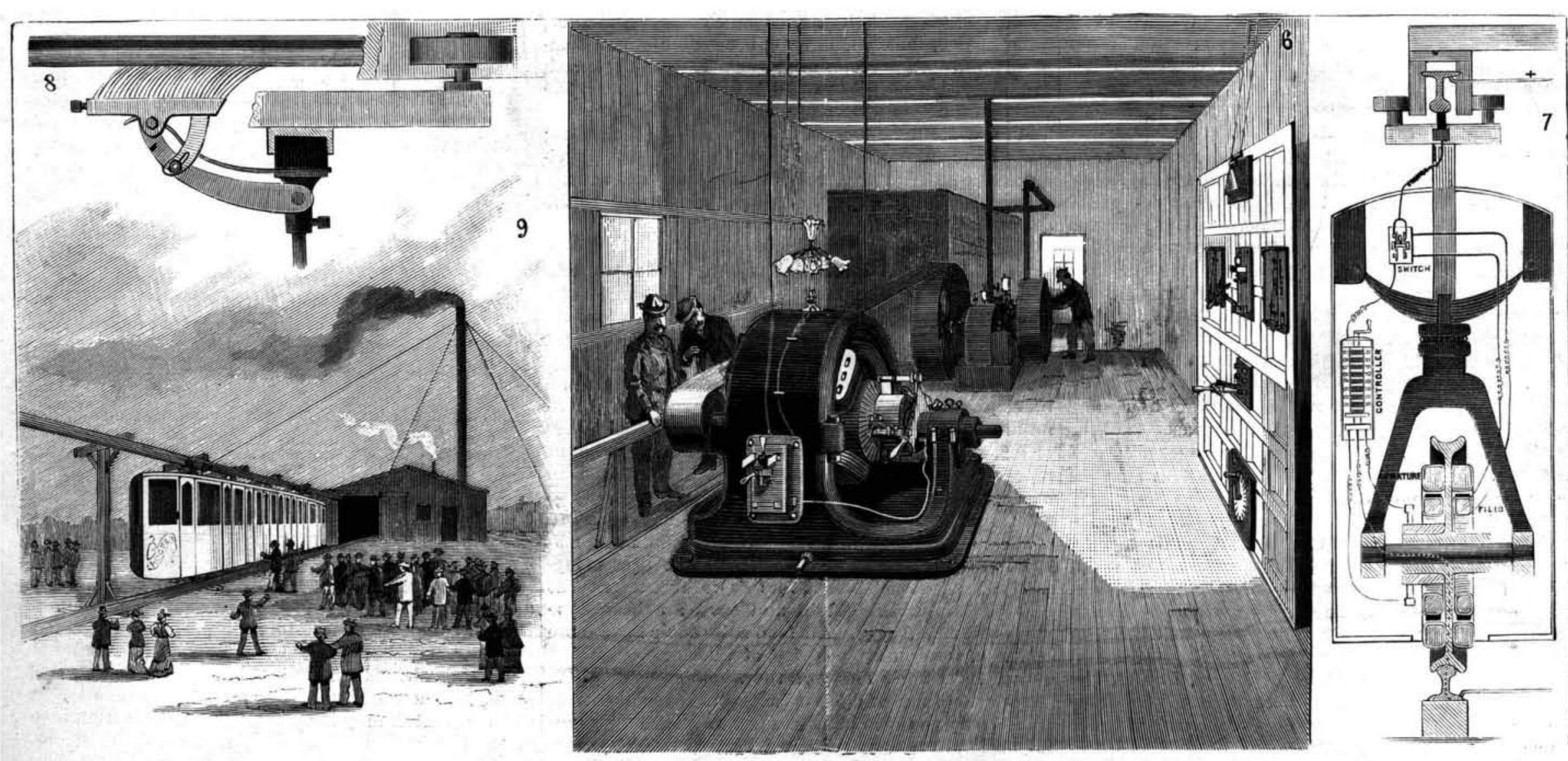
BOUDRIE & McMANUS' STEAM SHOVEL.

A STEAM SHOVEL FOR USE ON FLAT CARS.

To provide a platform for the shovel carriage whereby it may be readily moved from end to end of a train of cars, and the work of loading a train be thereby greatly facilitated, is the principal object of the invention herewith illustrated, which has been patented by Messrs. J. M. Boudrie and Thomas McManus, Rulo, Neb. Fig. 1 represents the improvement in use, Fig. 2 showing the clamping of the shovel carriage to the flat car, and Figs. 3 and 4 illustrating the track connection between two cars. In grooves or channels in the floor of each car are tracks, preferably of angle iron, and in the sill at the end of each rail is a transverse recess in which is a chair, the opposing chairs of meeting cars, or on the two ends of a car, being slightly different. In the one case the chair consists of a base plate with rigid curved arms at each side of the center, adapted to bear upon the web and base of a rail inserted between them, while in the other case one of the curved arms is pivoted, and held normally in closed position against the rail by a spring. When the cars are coupled together, the tracks are rendered continuous from one end of the train to the other by short coupling rails whose ends are seated in the chairs, the pivoted arm of one of the chairs being raised against the pressure of the spring to facilitate the insertion of the rail. The shovel carriage is mounted on flanged wheels adapted to travel on the tracks, and carries a motor, mast, and hoisting machinery of any approved description, the carriage being firmly held to the car upon which it is located by brackets of a clamp form, hinged to the side edges of the carriage. The lower end of each clamping bracket has a set screw by which the clamps are held in clamping position, they being thrown upon the floor of the carriage when not needed.

Chemicalized Flour.

In order to render fine white wheaten flour equal in digestive and nutritive value to brown or whole meal, without introducing any of the bad qualities of the latter, the inventor mixes with it one-quarter per cent each of magnesium phosphate and sulphate.—*W. Jones.*



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