

# SCIENTIFIC AMERICAN

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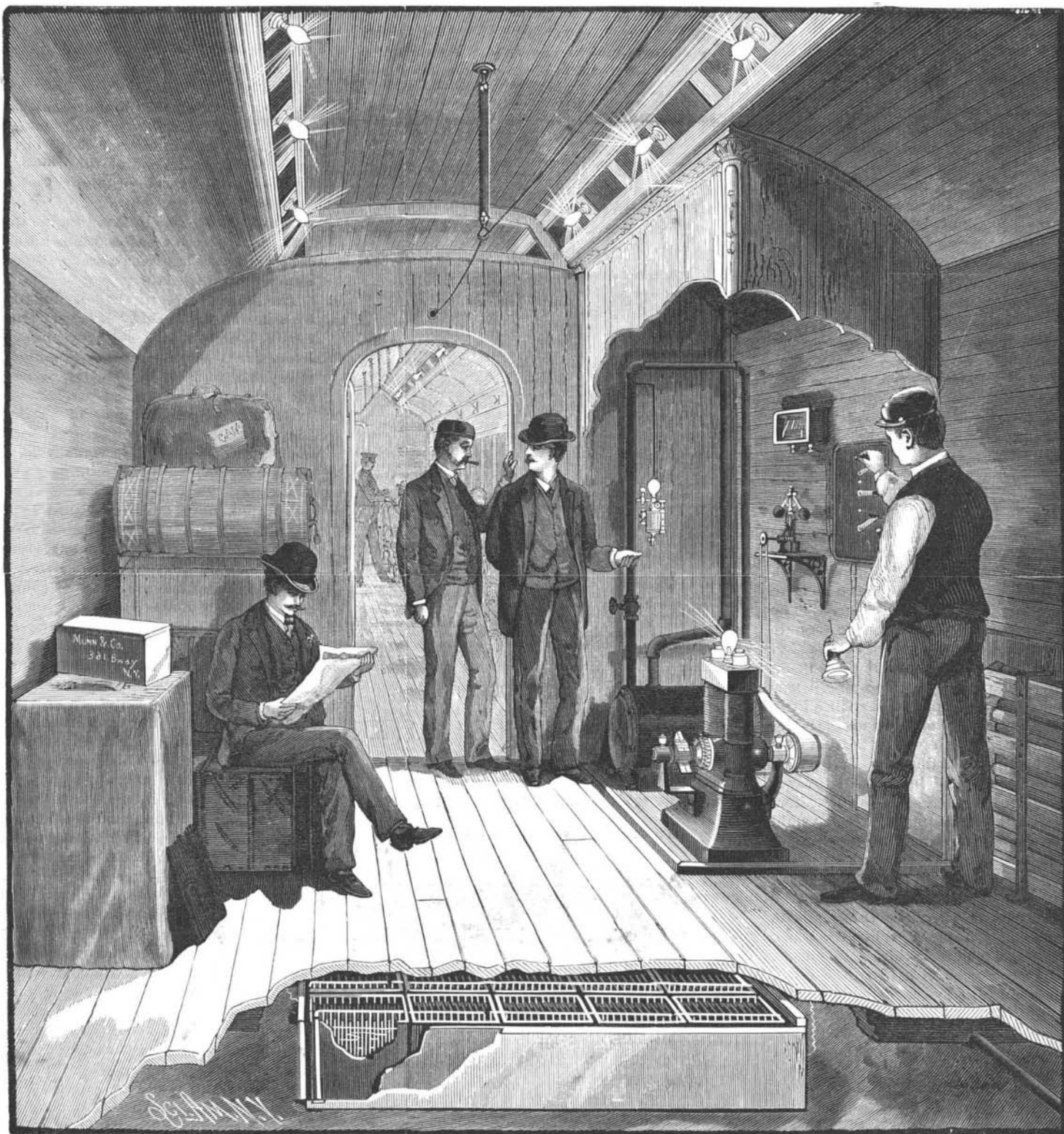
## THE BARRETT SYSTEM OF LIGHTING RAILROAD CARS BY ELECTRICITY.

The problem of maintaining the electric light satisfactorily on rail cars has always been esteemed a difficult one. Everything militates against it. The motion of the cars by its jar tends to disturb the lamp connections, and in effectively providing against this troublesome degree of ingenuity has been called upon. The use of a storage battery as the immediate producer of all the electricity used has already been illus-

The system which we illustrate to-day, due to Mr. S. H. Barrett, of Springfield, Mass., embodies both dynamo and storage battery, so as to obtain the merits of both. It seeks to overcome the defects of one source of electricity by the use of the conjugate generator. The main lighting agent is the dynamo. As this machine with its motor steam engine works more economically when large, a single generating plant is used to light four or five cars. Not only is economy of generation thus attained, but space is also saved, as the passenger

were necessary to detach one or more of the cars supplied by it, the cars so uncoupled could receive no more electricity from the dynamo, and would be left in darkness. To provide against these contingencies, each car is provided with its own storage battery. Of this, twenty cells are placed in a box under the floor of each car. They are stored or charged from the same dynamo that lights the cars.

Just under the centrifugal governor of the engine an automatic switch is arranged. By the action of this



THE BARRETT SYSTEM OF LIGHTING RAILROAD CARS BY ELECTRICITY.

trated and described by us.\* This class of plant certainly has done excellent work, but has its attendant disadvantages. Primarily, the storage battery is not as economical as the dynamo. It is charged from a generator at some station, and in discharging itself through the lamps does not return the full amount of electricity absorbed from the dynamo. Again, a storage battery can only run for a certain period at a given rate. If all the lamps are kept lighted, it is only a question of some hours when it will run down completely.

The storage battery by its portability, however, seems to overbalance its defects, and does good work for this special application. The unassisted dynamo, necessarily dependent upon a supply of steam for its running, seems ill adapted for train lighting.

\* See SCIENTIFIC AMERICAN, vol. lvi., No. 19, page 287.

cars have no encumbering engine to take up room and heat the cars, and to annoy by the jar and motion. The dynamo and engine is placed in the baggage car. Steam is supplied from the engine. An eight horse power Colt disk engine with a Tremont Electric Light Company 60 light dynamo is used. A steam hose coupled through to the engine provides the necessary steam connection.

This, with incandescent lamps, fifteen to a car, forms an effective and complete lighting plant, with one exception. As long as the engine is attached, the system will work. It matters not whether the train is stopped or in motion. The dynamo being run by an independent engine will always generate current. But if the locomotive is uncoupled, then the dynamo engine, being deprived of its steam, must come to a stop. If it

mechanism the batteries are thrown into or out of the dynamo circuit as required. When they run down and the current weakens, the switch closes and they receive a charging current. As soon as charged the switch opens, and cuts them out, leaving them in condition for service whenever called upon. Normally, the greater part of the charging would be done in the day time, so that the action of the dynamo at night, when the cars have to be lighted, need not be greatly complicated by the production of a charging current.

Switches to be operated by hand are also present in the system. By them the car lights can be turned from dynamo to battery or the reverse. Thus the contingency of a breaking down of the dynamo is effectually provided for.

The effect of a car thus lighted is very fine. In place

of the unsatisfactory oil lamps a quantity of brilliant incandescent lamps illuminate every corner of the car, so that it is as easy to read by night as by day.

The electric light leads are connected between the cars by an extremely simple arrangement. Two half cylinders, whose faces form the contact plates, are held together in a spiral spring socket.

The plant we have illustrated is now at work on one of the trains of the Connecticut River Railroad. It forms at least an interesting study of the subject of car lighting, and in its combination of storage batteries and dynamo indicates a distinct step in advance.

A New Heat Measurer.

Mr. C. Vernon Boys exhibited an instrument which he terms the radiometer to the Royal Society, March 24. The instrument is a modification of one invented by M. D'Arsonval, and consists of a minute thermo-electric junction forming one side of a parallelogram of which the other three sides are of copper.

The First Lightning Rod.

If we are to believe an Austrian paper, says La Lumiere Electrique, the first lightning rod was not constructed by Franklin, but by a monk of Seuffenberg, in Bohemia, named Prohop Diwisch, who installed an apparatus the 15th of June, 1754, in the garden of the curate of Prenditz (Moravia).

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NEW YORK, SATURDAY, SEPTEMBER 10, 1887.

Contents.

Table listing various articles such as 'Air, jet of, heating, device for', 'Asphalt, industrial uses of', 'Baecilus of scarlet fever, discovery of', etc., with corresponding page numbers.

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For the Week Ending September 10, 1887.

Table listing contents of the supplement, including sections like 'I. BIOGRAPHY.—Herr Krupp', 'II. CHEMISTRY.—A New Process for Estimating Carbonic Acid in Coal Gas', 'III. ELECTRICITY.—Practical Electricity', etc.

RESTRICTED IMMIGRATION.

It is agreed all around that unrestricted immigration is becoming too much of a good thing for this country, and that the immigration laws should be thoroughly revised, with the view of regulating the coming of foreigners to our shores.

In New York City, where immigrants delight to herd together, instead of going westward, the police last year made 74,035 arrests, which gives 1 arrest for every 20 persons.

Secondly, the increase of the death rate in the United States, and especially in New York, is said to be largely due to unrestricted immigration. Dr. Eklund, of Stockholm, makes the startling statement that the infants dying under one year of age in the United States average fifty per cent of the number born, while in Europe the death rate of infants under one year of age is twenty-five per cent of all deaths.

The Medical Record virtually indorses his statement by acknowledging that "it is very true that the numbers of our sick and defective classes are enormously swollen by the immense tide of immigration."

Thirdly, it is said in favor of restricted immigration that the immigrants' opportunity for getting employment is now less than it was fifteen years ago, when there was much railroad building and great industrial expansion.

In view of these facts, there can be hardly any difference of opinion concerning the necessity of building a breakwater to resist the tide of immigration by legislative enactments and rigorous execution of the same.

BRITISH NAVAL MANEUVERS.

The recent maneuvers of the British fleet did little to encourage those who pin their faith to monster ships and heavy armor. Indeed, even the unbelievers in this type were scarcely prepared for the sorry spectacle presented by the mightiest fleet afloat, for in the Irish Channel, where Admiral Baird essayed to defend the shore line against the assault of Fitzroy, and again in the English Channel and North Sea, when Hewitt