

whole of the cargo space in the vessel is occupied by tanks for carrying the refined petroleum, while the refuse oil to be used for fuel is carried in the water ballast tanks. Her boiler is of the ordinary marine type, with three flues of three feet six inches diameter each. These flues are fitted with a brick combustion chamber feeding the boiler along with that condensed from the main engines. The Charles Howard left for the Black Sea, and as she steamed down the river at full speed not a particle of smoke was visible from the funnel, the fires working admirably from the first start. It is stated that the owners propose to fit the remainder of the fleet with similar apparatus. The storage of the oil in the water ballast tanks has, we believe, never before been introduced in practice. It is an important feature, as it saves the ship-owner the heavy expenditure incidental to the fitting of tanks in the bunker spaces, and, combined with the substitution of air for steam, marks a decided departure in liquid fuel practice."

Paper Car Wheels.

A RECENT issue of *Harper's Magazine* has the following: The paper car wheel was the invention of Richard N. Allen, a locomotive engineer, afterward master mechanic of the Cleveland & Toledo Railroad, who took for his aim in life the production of a better car wheel than those in use. His first set of paper wheels was made in Brandon, Vt., in 1869, and after much scoffing he was graciously permitted the use of a wood car on the Central Vermont road, under which they were tested for six months. The Pullman Palace Car Company, in 1871, gave the first order for 100 wheels; ten years after the Allen Paper Car Wheel Company, with great shops at Hudson, N. Y., and Pullman, Ill., produced and sold 13,000 in a single year. One of the set first experimented with under a "sleeper" is shown at Hudson, with a record of 300,000 miles' travel. It is the body of the wheel only which is of paper. The material is a calendared rye straw "board" or thick paper made at the Allen Company's mills, at Morris, Ill. This is sent to the works in circular sheets of 22 to 40 inches diameter. Two men, standing by a pile of these, rapidly brush over each sheet an even coating of flour paste until a dozen are pasted into a layer. A third man transfers these layers to a hydraulic press, where a pressure of 500 tons or more is applied to a pile of them, the layers being kept distinct by the absence of paste between the outer sheets. After solidifying under this pressure for two hours the 12-sheet layers are kept for a week in a drying room heated to 120° F.; several of these layers are in turn pasted together, pressed and dried for a second week, and still again these disks are pasted, pressed and given a third drying of a whole month. The result is a circular block containing from 120 to 160 sheets of the original paper, compressed to 5½ or 4½ inches in thickness, and of a solidity, density and weight suggesting metal rather than fibre. The rough paper blocks are turned accurately in a lathe, when shavings like leather and a cloud

of yellow dust fly off, to a diameter slightly greater than the inner circle of the tire. The hole in the centre is also made on the lathe, and after the paper has received two coats of paint to prevent moisture working its way within, the cast iron hub is pressed through, by the aid of the hydraulic press, and the hydraulic back plate is clamped on. The suction of enormous hydraulic power now drives the paper centre into the tire, by help of the bevel.

The Railway Service.

THE staff of men in the Canadian Pacific shops at Winnipeg has been much reduced and now there are only about 200 hands employed. These, however, have all they can do to get ready the cars to be used in moving the great crop of this year.

THE *Weekly Telegrapher* says: From straws which we have been able to see flying about in the air, and from a positive knowledge we have of the right and public favor of the proposition, we believe that Sunday labor will soon be relegated to the rear. The running of Sunday trains, we believe, in ordinary cases is a useless expense, and an injustice to employees, that is fast being found out and abandoned.

THE Canadian Pacific beats them all for improvements. Other roads have freight and baggage cars, coaches, sleepers and pay cars; first class, second class and emigrant cars, president's cars, directors' cars and manager's cars and snow-ploughs. The Canadian Pacific has all of these, and a prison car besides. The prison car has four separate cells and a guard-room, all stoutly ironed and capable of standing a siege from without or a mutiny within. The car is used to transport prisoners from the Pacific coast to the Kingston penitentiary. —*Exchange*.

THERE is something absurd in the fact that the general manager of the Grand Trunk Railway Company has been indicted for manslaughter on account of the killing of two men who were run over at a crossing by a train of that road. Railway companies and the individual officers and employees of these companies should of course be held to strict responsibility for their acts, but the idea of holding personally liable for the possible negligence of a train hand or a flagman the general manager of a company employing many thousands of men, of whose character and acts he can by no possibility have personal knowledge or oversight, does not seem within the bounds of justice or reason. —*Railway Age*.

I have found upon investigation that the English railways have to bear the onerous tax in the way of furnishing free transportation to prominent individuals and officials, as did the railroads in the United States before the passage of the interstate commerce bill. I was told by a railroad official the other day that all of the royalties travel free, and that they expect in addition special coaches. The visiting royalties have also been furnished

free transportation, and in many instances special trains. This pass system must be very expensive. Coming up from Portsmouth the other day I got a seat on the special train assigned to the members of the house of peers. These peers had with them innumerable relatives, and I noticed at one of the stations where the guard came along to take up the tickets that he looked very much surprised when I gave him mine. It was apparently the only ticket taken up by him on the train. Every peer and peeress in prospect and every peer's and peeress' relatives had passes. —*Exchange*.

The Dominion and Industrial Exhibition.

GREAT as has been the success attending previous exhibitions held in Toronto, under the auspices of the Industrial Exhibition Association, this year's event was the greatest success of all. This is due to the enthusiasm with which President J. J. Withrow and his co-directors, all leading citizens of Toronto, enter upon their work, and the thorough business ability they display, as also to the executive skill of Manager H. J. Hill, who is master of every detail of the work. With this year the Association's lease of the buildings from the city expires, terminating what might be called the trial period of the fair. When, ten years ago, the holding of this exhibition was undertaken there were very grave doubts on the part of many as to the possibility of success. Such doubts were set at rest, however, by the very first fair, and since then the exhibition has become one of the institutions of the city, the one of which the city has greatest reason to feel proud. There is no doubt whatever that the association's lease will be renewed and that the exhibition will enter upon another term of even greater prosperity than before. The display this year in every line was greater than ever before. Machinery Hall, in which RAILWAY LIFE naturally feels the greatest interest, was stocked with the products of some of the most important manufacturing factories in Canada. The display of wood-working machinery and of steam engines was especially good. A number of new devices for use in various departments of industry attracted great attention. So far, the inventor has not had the prominent place in the exhibition that his importance entitles him to. It would be well if the association could establish a department for the display of models of patented devices. No section of the fair would arouse greater genuine interest or do more good to both exhibitors and visitors. The railways were particularly liberal with the association this year, granting very close rates. All the roads carried enormous numbers of people. The Grand Trunk Railway, whose track passes by the northern gate of the grounds, ran trains from the city every twenty minutes and during the second week every train was crowded. The management of this business reflects great credit upon the officers in charge of it. The Canadian Pacific Line to Parkdale, the station being near the fair ground, also carried a large number of people, and did it without hitches or delay.