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THE AUTOMATIC COUPLER LAW TO BE ENFORCED.

Our readers are doubtless aware that there is a law upon the statute books requiring the railroads to equip all their freight cars with automatic couplers, and to equip a sufficient number of them with train brakes to enable the speed to be controlled by the engineer. The time limit for making these changes was set for the first of January, 1898, and the near approach of that day finds the majority of railroads either unwilling or professedly unable to meet the requirements of the law. The statistics in the hands of the Interstate Commission show that some of the railroads have been as diligent in complying with the demands of the law as others have been dilatory. Five roads, the Boston and Albany, the Delaware, Lackawanna and Western, the New York Central and Hudson River, the New York, Ontario and Western and the Lake Shore and Michigan Southern, have equipped the whole of their freight cars with automatic couplers, and from 50 to 75 per cent of their cars are fitted with train brakes. This is an excellent showing and speaks well for the efficiency of these roads. Among the forty-five other roads that have sent in reports to the commission, the percentage of cars equipped with automatic couplers varies from 11 per cent on the Norfolk and Western up to 94·28 per cent on the Chicago and Northwestern. The equipment with train brakes varies from 6 per cent on the Cincinnati, Hamilton and Dayton Railroad to 92½ per cent on the Atchison, Topeka and Santa Fe Road.

Now it appears that a large number of railroads are petitioning the commission for an extension of time for completing their safety equipment. The commission require that all petitions be filed by November 15, and that each road shall state how many cars have been equipped each year since March 2, 1893. In extending the time we understand that the commission will make no general extension, but will consider each case by itself, and will take into consideration the financial standing of the road, and the various causes, such as the "bad times," which may have prevented full compliance with the law.

We sincerely hope that the commission will stand by this policy and maintain a firm attitude in the presence of the influences which are sure to be brought to bear to obtain concessions. It is not unlikely that the very roads that have been most delinquent will be most importunate for further delay. No doubt a strenuous effort will be made by those roads which have not been paying dividends to secure extension of time on this very ground; but that this does not constitute sufficient cause is shown by the case of the Southern Pacific, which is not a dividend-paying property, and yet is able to report that 69 per cent of its cars are equipped with automatic couplers and 96 per cent with train brakes. Another case is that of the Baltimore and Ohio, which has equipped 80 per cent of its cars with both couplers and brakes.

In the presence of such cases as the above the commission will, no doubt, receive very coldly the petitions of such roads as are paying good dividends. A notable case is that of the Chicago and Alton, which in spite of the fact that it has been paying dividends as high as 8 per cent, has equipped only 37·9 per cent of its cars with automatic couplers and 17½ per cent with train brakes. Yet this company is one of the leading petitioners for an extension of time.

Now the question of safety equipment is a question between the profits of the companies and the safety of the employes. One section of the law gives the employe remedy where safety appliances are not in use "by relieving him of the risk which he is held to assume under the common law and would give him the same right to recover as an outsider." If the petitions of the railroads are granted, the commission will take away from the employe this very important remedy. This would scarcely be justifiable, even in the case of such roads as are in financial straits, but in the case of many of the wealthy and profitable roads which are likely to apply for extension of time, it would be a positive shame.

The great body of railroad employes at large will be glad to know that the Interstate Railroad Commission is disposed to take hold of the matter with a firm hand, and it is to be hoped that the welfare of one of the hardest worked body of men in the country will be carefully safeguarded during the hearing, which will take place on the first of December.

THE ROLLER BOAT PROBLEM.

One would have thought that the failure of the curious roller boat of M. Ernest Bazin would have deterred inventors from further experiment in such an unpromising field, at least for the present. The causes of failure were so radical and inherent in the principles of the design that it is difficult to see what hope there is of any modification in the form of this type of boat serving to render it successful. It will be remembered that the Bazin design consisted of a platform upon which were located the engines, boilers and passenger accommodation, and that this superstructure was carried by six large airtight disk-shaped wheels, arranged in two parallel lines, whose buoyancy served to keep the strange craft afloat.

Each pair of wheels was driven by a 50 horse power engine, and under their combined influence and that of a screw propeller, the ship was rolled, as it were, over the water. The professional standing of M. Bazin, and the fact that a model had shown very promising results in experimental tank tests, restrained the criticism which would ordinarily have been made upon a design which had so many features to render it impracticable, at least upon the high seas.

It is unnecessary to recount the failures of the ship. It was found that the wheels picked up and carried round with them a film or layer of water, whose weight, dragging upon the wheels in the upward half of their revolution, acted like a brake and brought down the speed to a very disappointing figure. It was stated that the inventor sought to overcome the difficulty by the use of some kind of shield or scraper which should free the wheels of water at the water line. This device, however, failed to produce better results. An attempt was then made to increase the speed by an increase of engine power, but the added weight of machinery immersed the wheels so deeply that the increased resistance absorbed the extra engine power, and the speed remained as low as before.

Apart from the question of speed, however, it is questionable whether the Bazin boat would have been comfortable, or even manageable, among the giant rollers of an Atlantic gale or in the wicked cross sea that is often met with in the English Channel.

The failure of this costly venture, however, has not daunted the designer and builders of another roller boat, which is now having its preliminary trials. The designer in this case has decided to dispense with wheels and let the ship do its own rolling. According to published reports the so-called boat is nothing more or less than a huge cylinder 22 feet in diameter and 110 feet long. At about 5 feet from each end the diameter is reduced to 15 feet. Inside the cylinder a number of circular steel tracks are laid completely around the shell, and upon these, by means of flanged wheels, 3 feet in diameter, the engine and boiler platforms travel, the idea being that whatever rotation there may be of the cylinder, the platforms will maintain a nearly level position in the lower part of the shell. Each platform is to carry a boiler and a pair of high speed engines, and the latter will be geared to the platform wheels in the ratio of two to one. The engines are set in motion so as to turn the platform wheels in the direction in which the boat is to travel. If the cylinder were held rigidly in one position the platform would climb the circular track and be carried up the inside of the shell; but as the former is free to move on the water, and is provided with paddle wheel floats, it is expected that it will roll forward with considerable speed across the sea.

It will be seen that the Toronto boat is exposed to the same difficulty as M. Bazin's vessel, in that the water is liable to cling to the surface of the cylinder and be lifted up and carried over, acting as a brake to check the rotation. This effect will be intensified by the radial floats, which will of themselves tend to lift a large quantity of water, that is, supposing that the boat attains any reasonable speed. When the vessel is in motion, the weight of the engine, boilers and platform (which, it will be remembered, are all the time trying to climb the inside wall of the cylinder) will be balanced by the resistance of the water displaced by the cylinder, by the internal friction of the machinery, and by the necessarily large amount of water carried up on the rear side of the cylinder. The last, we think, will be the greatest obstacle to progress when the vessel is in still water. What will happen when the cylinder attempts to roll up the face of an oncoming wave 15 to 25 feet high is a matter of conjecture.

Another troublesome problem to be solved will be that of wind resistance, as the following considerations will show. It is stated that at its launch the cylinder drew 2 feet of water, and that its weight was 70 tons. The total weight is to be about 100 tons, and the draught, when everything is in place, will therefore be, say, about 2 feet 6 inches. This will leave 19 feet 6 inches as the height of the cylinder above the water line. As the length is 110 feet the plane area presented to the force of the wind will be 2,145 square feet. The wind pressure provided for in engineering structures is from 35 to 45 pounds per square foot. If we take the lower figure, we get a total pressure against the vessel in a strong gale of 37½ tons.

As the engines and platform are to weigh apparently only 30 tons, it is evident that however far they may roll up the forward or windward face of the cylinder, they would never prevent the vessel from being rolled bodily to leeward before the force of the gale. Even if the wind pressure be assumed at the low figure of 20 pounds to the square foot, the total pressure against the boat's surface would still be over 20 tons, and if to this be added the internal friction of the machinery, the resistance of the water displaced and the drag of the water lifted up by the floats and adhering to the shell, it is reasonable to suppose that the roller boat will refuse to roll except in calm water or before a favoring wind.

This experiment in marine roller locomotion is as novel in its way as was its predecessor, and fortunately, as in the case of the French boat, it is being carried