



FRIDAY, SEPTEMBER 19, 1902.

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main causes of the comparative immunity of British roads from accidents is the much larger number of trained men permanently employed in all branches of the service. There is a startling disparity between the United Kingdom and America in the total number of employes per mile of road. In America for year ended June 30, 1901, it was 5.48; in United Kingdom, 24.54. Of those employes in Conducting Transportation Department the comparison per 100 miles of road is approximately as follows:

Table comparing employes per 100 miles of road in the United Kingdom and America. Categories include Enginemen, Firemen, Trainmen, and All others.

It is probable that the British roads include certain classes of men, such as carters or draymen, in their total, while we do not. It is also certain that they have a chance to effect some of their desired economies in increasing the size of their power and so reduce the number of their engine, fire and trainmen; but, after all said and done, it looks as if our roads were undermanned judged by European standards, and the extension of the block system which you advocate would be one means of reducing the disparity.

But, then, crops out the question of wages, and the American railroad proprietor turns and says "Yes, more men, but where find the money to pay them when they all insist on such high wages." Very true; it is difficult to make ends meet, but is the problem made any easier by appropriating to the bond and stockholders what one may term the "unearned increment" in the value of the properties?

How many roads are there in the country that adopt the wise and, above all, the just method of distributing this unearned increment that the Pennsylvania Railroad Company adopted when it recently increased its capital stock? The unearned increment of \$10 a share was taken from the pocket of the shareholder and put into the property for the ultimate benefit of the public, the shareholder and the employe. Contrast this with the operation of the Jersey Central turned over to the Reading, the manipulation of C. B. & Q., and now the unblinking effrontery of the C. R. I. & P. "reorganization."

Sir, I am one of those old-timers who believe that moral causes rule the world's affairs and that only by the observance of decent public morality can a country be held steady on its foundations, and I ask, in all soberness, if we are exhibiting decent morals in putting out so much water when accidents are daily happening and lives being sacrificed for lack of double tracks and adequate protective service?

Furthermore, we may rest assured that the native born working masses of this country are not unlettered fools. Many of them are readers and thinkers, and when the time comes, as it must come sooner or later, that the railroads shall seek to carry their burden of water by reducing the number of men employed, thereby endangering the efficiency of the train service, or by cutting down wages, they will know enough to put their fingers on the sore spot and decline to have the healing done at their expense. Let those who to-day are revelling in the possession of millions of railroad securities, for which they paid not one cent, take heed that they have not sown the wind to reap the whirlwind.

Whatever may be said about the capitalization of British roads, the sum total represents actual money spent on them, and that is probably another main reason why accidents are fewer there than here.

I am encouraged to write you this letter in that the President is giving us all a good lead on matters akin to those here treated of, and if one may believe current talk, he is incurring the serious enmity of some of the financial centers in doing so. I believe the President is playing a high-minded, patriotic part, and you, sir, appealing as you do in your columns more to the intellectual than the money-making portion of the community, may be of the same mind and may not think it inadvisable to give this letter place in your columns.

I must add, as a last word, that my remarks are intended to bear on railroad financing exclusively.

OBSERVER.

Rules for Using the Train Staff.

[Extracts from the Rules of the London & North Western Railway for Working Single Track Railroads by Train Staff and Ticket. The train staff is a billet of wood about 22 in. long. It has metal trimmings and is lettered with the names of the stations between which it is used.]

A Train Staff or Train Ticket must be carried with each train, and no train must be permitted to leave any Staff Station with a Train Staff Ticket, unless the Staff for that portion of the Line over which it is to travel is then at the Station.

No train must shunt for another train to pass except at a Train Staff Station.

The person in charge of the Staff Working [at a station] for the time being is the sole person authorized to receive and deliver the Staff or Ticket.

When a train is ready to start from a Station and no second train is intended to follow before the Staff will be required for a train in the opposite direction, the person in charge of the Staff Working must give the Staff to the Engine Driver, who will then place it in the Train Staff socket, where provided, on the engine.

If other trains are intended to follow in succession before the Staff can be returned, a Ticket indicating that the Staff is following must be given by the person in charge of the Staff Working to the Engine-driver of the first train, the Staff for the Section being shown to him, and so on with any other train except the last, the Staff itself being given to the Engine-driver of the last train, as directed in the preceding Rule. The person who hands the Ticket to the Engine-driver must satisfy himself that the train has gone with such Ticket before he allows another train to follow. After the Staff has been sent away no other train must, under any circumstances, leave the Station to follow in the same direction until the Staff for that Section has been returned. The Station-master or person in charge of the Staff Working must consider it his first duty to deal with the Train Staff or Ticket on arrival of the Train, and at Crossing places must satisfy himself that the train, running in the one direction has arrived complete, with the Tail Lamp on the last vehicle, before handing over the Staff or Ticket to the Engine-driver about to travel in the opposite direction.

No train must be permitted to leave a Station until the Engine-driver has received the proper Staff or Ticket for that Section of the Line over which he is about to travel, and he must not take the Staff or Ticket from any other than the person in charge of the Staff Working for the time being. He must be careful not to take the Staff or Ticket beyond the Staff Station at which it should be left.

Each Staff has engraved or marked on it the name of the Staff Station at each end of the Section to which only it applies. The Staffs, Boxes and Tickets for the different Sections are painted and printed in different colors, and the Staffs of adjoining Sections are different in shape.

In the event of an engine which carries the Staff breaking down between two Stations, the Fireman must take the Staff to the Staff Station in the direction whence assistance can be obtained or is expected, in order that the Staff may be at the Station on arrival of the relieving engine. Should the engine that fails be in possession of a Ticket instead of the Staff, assistance must only come from the Station at which the Staff has been left.

When a Ballast train has to work on the Line, the Staff must be given to the Engine-driver in charge of it. This will close the Line whilst the Ballast train is at work. Points giving communication between the Sidings and the Running Line controlled by the Train Staff cannot be opened without the Train Staff for that section, and the Train Staff cannot be removed until the Points have been placed in the proper position for trains to pass upon the Running Line.

Some Notes on Piston Valves.\*

Now that piston valves are attracting so much attention, and many locomotives are being equipped with them, it may be of interest to call attention to some peculiarities inherent to certain types, and especially to that of the solid design with internal admission.

The following types are to be found on simple engines: (1) The solid form with external admission and internal exhaust. (2) The hollow form with internal admission and external exhaust. (3) The solid form with internal admission and external exhaust.

The first (solid external admission) has very much the same action as the slide valve, but its steam passage in object to it because it requires the live steam passage in the saddle to be divided with a separate branch leading to each end of the valve chamber, thereby bringing the live steam in contact with the more exposed parts of the cylinder with resulting condensation.

The second (hollow admission) has the internal admission and exhausts at the ends, but in addition a hollow center which permits the exhaust at either end to circulate freely and instantly from one end to the other. It is objected to by some designers on the ground that the live steam is jacketed with the cooler exhaust steam in the hollow center of the valve resulting in condensation.

The third (solid internal admission) also has the internal admission, but is without the hollow center, thereby preventing the exhaust at either end from circulating back and forth except in the roundabout way through the cylinder saddle and back to the opposite end of the valve chamber. This takes some time to do, and, therefore, causes an unequal pressure on the opposite ends of the valve which is greatest with the following combined conditions: slow speed, full throttle, maximum cut-off, and at the moment exhaust opening occurs. The extent of this unbalanced pressure does not seem to be generally appreciated.

Indicator diagrams taken from the cylinder and the valve chamber of a consolidation locomotive show a pressure of 54 lbs. on the end of the valve exhausting, and but 2 1/2 lbs. at the opposite end at the same moment. The diameter of the valve is 11 in. and the unbalanced load on one end due to this pressure amounts to 4,900 lbs. The suddenness with which this load is applied is indicated by an almost perpendicular rise on the diagram near the ends. The unbalanced load on the end of the

\*Presented at the September meeting of the Richmond Railroad Club by Mr. F. A. Houghton, Supt. of the Richmond Locomotive Works.

The Engineer at the St. Louis Fair.

St. Louis, Sept. 2, 1902.

TO THE EDITOR OF THE RAILROAD GAZETTE: The agitation in engineering societies as to the propriety of a code of ethics to govern the members of our profession, is evidence of a desire to ennoble the calling of the engineer. None of the so-called learned professions is so intimately connected with the material progress of our country as is that of engineering. Yet, in the face of all this, the profession is not held in that high esteem to which it is justly entitled. This is due, in a great measure, to the fact that the public is not as familiar as it should be with the functions of the engineer, whose individuality is more or less overshadowed by the great corporation which employs him.

Much can be done at great expositions, by bringing the general public into contact with the work which the engineer has wrought and which emphasizes his science, ingenuity and skill. Heretofore, engineering work at expositions has been somewhat obscured by being mixed up with transportation and other related matters which indeed are closely akin to it. In the coming exposition at St. Louis, civil, military and architectural engineering pertaining to public works, will be housed together in the Liberal Arts Palace.

In the interests of the profession, as well as those of the Exposition, I hope to secure for the several groups devoted to engineering, the best examples of what the engineer has wrought in all parts of the world. With the proper co-operation of the engineering profession, which should be readily accorded, there would be gathered at the coming exposition the greatest engineering exhibit which the world has ever known. Every engineer can do something toward the realization of this much-desired result.

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Railroad Men and Railroad Finance, Here and in England.

Washington, Sept. 9, 1902.

TO THE EDITOR OF THE RAILROAD GAZETTE:

With reference to article, entitled "English and American Railroad Employes" in your issue of 5th inst., a very effective way to lessen the number of accidents would be, of course, to hasten on by every possible means, using every available source of revenue for it, the double tracking of our roads. The aim must always be to eliminate the human elements of frailty and forgetfulness from railroad operations, and what better step could we take in that direction than in rapidly reducing the number of miles of track used in both directions? Of course, progress is being made in this direction, but how much faster might be the progression if all the money used at the present time to pay interest on bonds and stocks for which no value has been given were put into the properties?

I am inclined to agree with the view that one of the