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Extracts from Paper Read Before the St. Louis Railway Club, May, 1913

By MR. R. COLLETT, Superintendent Locomotive Fuel Service.

Statistics are not generally interesting, but it may be of interest to those who have not given the subject particular thought or study to know that for the year ending 1912 there were 236,444 miles of railroads in the United States; the cost of fuel for operating trains over them \$230,555,544.00, or 11.85% of the total operating cost, 8.22% of the gross earnings, a cost of about \$4,000.00 per year for each locomotive in service. In the past two years there has been considerable increase in the unit cost of fuel, and this has further increased the ratio of fuel expense to the gross earnings.

The fuel bill on the 17 largest railroads entering St. Louis and East St. Louis for the fiscal year ending June 30, 1912, was \$51,432,545.00. We can readily understand, therefore, that railroad managers are very much interested in keeping the cost to the lowest possible figure; and when purchasing new locomotives or overhauling engines in service, consideration is given to equipping them for the greatest economy in the use of fuel. Appliances of whatever nature, however, unless properly looked after, do not produce results, and it, therefore, resolves itself largely into the matter of the human element that is securing proper methods of caring for the locomotives, and its devices at the terminal and on line of road. It is hardly to be expected that an engineer and fireman would take charge of a \$20,000.00 locomotive with \$30.00 or \$40.00 worth of coal in the tank, and access to that much more on the trip, without feeling a personal responsibility in the engine and its supplies, and there should be some way to determine whether or not proper efficiency is obtained, and the crew given credit for what they are able to do.

At the close of the year 1910, a plan was originated by Mr. W. C. Nixon, in charge of operation of the Frisco Lines, to look into the matter of locomotive fuel economy. Briefly, the plan was to undertake to find out what we

were doing in the use of locomotive fuel, and what we might reasonably expect to do and how to do it. Some of the items given special emphasis by Mr. Nixon were:

Waste of fuel by reason of engines delayed on road.

Engines kept under steam unnecessarily at roundhouse.

Proper handling of engines by engineers and firemen.

Condition of engines,—as well as a number of other items.

The result of the effort made in the direction of fuel economy at the close of the year 1911 and each subsequent year has shown a very gratifying saving in all classes of service.

Item three, proper handling of engines.—In the management of engines, there are not a dozen different correct ways to run and fire an engine, and it is remarkable how nearly alike the most skillful engineers and firemen do their work. The engineer who makes the best fuel performance pays particular attention to a number of things. He knows what the condition of the fire is when he pulls away from the terminal and handles engine accordingly. He does not slip the drivers if it can be avoided, or tear holes in the fire. He opens the cylinder cocks as soon as circumstances admit, and relieves the condensation, avoiding damage to pistons or cylinders or washing lubricants off the cylinder walls and valve seats. He starts the lubricants early enough to have the cylinders and valves well oiled before starting train and feeds both sides alike and regularly. He does not change reverse lever from full stroke to cut-off in one or two movements, but shortens the cut-off gradually as the speed increases and handles both the reverse lever and throttle, so that, especially on slide valve engines, steam chest pressure does not back up into the oil pipes and retard lubrication. He works steam as expansively as consistent with good lubrication, schedule and general condition of valve gear, and this, without particular reference to the perpendicular position or angle of reverse lever. The injector is handled so as to not over-supply the water to the boiler requiring that the injector be shut off on account of too much water, nor does he allow the fireman to do so when pumping the engine. He understands the language of the locomotive and can feel its pulse without the necessity of a certain amount of noise at the stack, provided the engine will do its work without such noise. The running time is used between stations, and the movement kept as continuous as possible. The result of his observations and opinions are responsible for the engines having been equipped with the present modern type of quadrant and reverse lever and throttle, as well as other devices that will permit of the engine being operated skillfully, and he utilizes them to the best possible advantage and at the completion of his trip reports the items that are needed to be done to maintain or improve the engine's efficiency. A careful crew, working together, can do more to establish a proper fuel performance than all the devices known.

Proper firing of engines.—The first thing, of course, is to start firemen out right when employing them. Formerly, in putting on new firemen, we gave them a student letter, to be endorsed by three engineers with whom they had ridden. There was a tendency for them to ride with the en-

gineers they thought would endorse their letter, or firemen with whom they were acquainted. We now tell the student firemen who to ride with, and before accepting service they are interviewed by the assistant superintendent of locomotive fuel service, who either approves or rejects their application. We try to anticipate the need of firemen and to have desirable men in view for these positions. For the men already in service, we have a first, second and third year's progressive examination. The knowledge gained through discussion and study is reflected in the work of the firemen. It is natural that a fireman, having told the instructor the proper way to fire an engine, will endeavor to carry out this practice.

We want, if possible, to have the engines so that the work will be comfortable for the firemen. We want them to do their work in the easiest way, which is by carefully preparing the fire at the terminals before starting, firing light and often, and keeping fire clean as possible. The instructions to the fireman should be made so the engineer will be agreeable to them and assist in carrying them out when we are not on the engine. At best, we can be with one crew only a small per cent of the time, and it is largely the personal pride they take in their work that counts. If one crew can handle a seven-car, all-steel passenger train over a division of 119 miles and not take water over the entire division; another crew handle a local passenger train of seven cars over a 286-mile division and only take water twice, with a tank of 7,000 gallons capacity; or another engineer and fireman with a freight engine handle 90% of the engine's potential rating and run 97 miles between water tank stops, it indicates that a first-class fuel performance is being made, and that the engine is in first-class condition and well handled; that the work is less arduous for the fireman than if the opposite were true, and it further indicates that we should try to bring the other engines and crews as nearly as possible up to this standard of efficiency. I do not mean by this that they should necessarily make the same run between water tanks, but such performance shows that neither fuel nor water has been wasted.

Engines not in good condition.—One of the most important factors in fuel economy is the condition of the engine. It is not possible, of course, to have an engine 100% all the time. It is essential that draft appliances be maintained to standard, that is as nearly as possible to what is found to be correct dimensions, for the different classes of engines, and if engine does not steam freely, the trouble should be looked for elsewhere. If the engine burns a level fire, and the proper location of petticoat pipe and draft sheet has been determined for this class of engine, there is very little gained by moving the petticoat pipe up or down, or change draft sheet; there is more likely to be a leak in steam pipes or exhaust joints. The first thing to ascertain is, whether the flues are thoroughly clean, and whether there are any holes in grates, around the grate bearing bars or dump grates, and if there is plenty of air opening in the ash pan. If these items are found to be correct, a water test should be put on the steam and exhaust pipes. A very prevalent cause for waste of fuel is that of reducing the nozzles. Engineer may report on the work book, "Reduce nozzle; engine is not hard

Frisco Club Plan

The open season of the Frisco Railroad Club of St. Louis begins September 18, with every prospect of a banner year.

It has been decided, in place of dinners once a month, that the entertainment shall be diversified and only on alternate months will evening entertainments be given. These entertainments, though, will be exceptionally good. In order that this may be accomplished the entertainment of the odd months shall consist of a luncheon where each member pays for his lunch and is assessed the usual monthly dues. By doing this the club is enabled to have two month's dues for each evening's entertainment, and it has been decided that at those entertainments the appropriation for foodstuffs shall be held down in order that all available cash can be expended in securing some high-class performance or performer, well worth seeing or hearing.

At the opening meeting at noon, September 18, all the members are requested to bring at least one other person eligible to membership, and it is hoped to make the luncheon meeting so enjoyable that a large majority of them will announce themselves applicants for membership.

The entertainment and program committees are at work even at this early date getting ideas and plans for the October meeting and the members of these committees promise what might be termed a gala occasion.

The Value of a Postage Stamp

If you wish to write a letter to an American railroad official, his corpora-

tion will have to haul a ton of freight—two thousand pounds of average freight—coal, ore, silks, ostrich feathers and everything, for more than two and one-half miles to get money enough to buy a postage stamp to send you an answer. Out of that kind of service the corporation must pay its employes, buy its materials, pay its rents and taxes, interest on its debt and make its living.—Frank Trumbull, Address March 14, 1911, Canadian Club of New York.

Our New Department

Beginning with this issue THE FRISCO-MAN is opening up a Woman's Department, which will be edited by Mrs. E. G. Newland, Augusta, Kans.

A section of the magazine will be devoted each month to communications from Frisco women, containing suggestions which may be helpful in promoting Safety First, or gossipy articles pertinent to the Frisco and its employes.

Frisco women are urged to aid in making this department the most interesting section of the magazine, and this can be done by the co-operation of all. Keep posted on what you believe will make good reading matter for the department and let us have your ideas. Many of the new and modern methods adopted by the Frisco have originated from suggestions made by some of our associates.

Send your letters, giving your name and address, to Mrs. E. G. Newland, Augusta, Kans. She will incorporate them in the Woman's Department matter and forward same to us each month. Letters can be sent R. R. B., thus avoiding postage cost.