

The Engine Crew—With Reference to Vital Subject of Fuel Economy

Being a Paper Read at Fuel Meeting by Engineer GEORGE R. BERGER

WHEN I was asked, at the last fuel meeting held in St. Louis, by Chairman Harvey to have a paper at this meeting, I was given the privilege to choose my own subject, and it is, therefore, only natural that I should speak of the work of the engine crew with reference to fuel economy.

While I realize that this subject has been discussed so many times, that there is hardly any opportunity to bring out anything new, it will probably not be amiss to be again reminded of some of the old and approved methods of doing the work which have proven successful in preventing fuel waste.

In order to enable the most conscientious and efficient engine crew to make a good fuel performance, the engine must be in good condition, free from leaks and blows, valves square, power reverse gear (when engine is equipped with same) must be kept in first-class condition. Grates must be in good condition and engine must be drafted so as to burn fire equally over entire grate surface. There should be no air leaks around the front end which would destroy part of the vacuum created in the front end by the exhaust. Engine should be equipped with proper size injector. It is also of the utmost importance that throttle valve is well balanced, especially on superheated engines which have to be drifted with cracked throttle, because if throttle valve is not well balanced, considerable more steam will be used than is necessary. Double latches on reverse levers should be maintained in good condition so position of lever can be changed one-half notch at a time when it is economical to do so.

With an engine in the condition as previously outlined, the engineer will then be able to work the engine in such a way as to consume the least possible amount of fuel for the work it is doing. He will see that the engine is well lubricated, as dry bearings, and dry valves and cylinders, especially, waste fuel. Another item which must be watched closely is that the engine is hooked up as soon as possible after reaching the top of a grade as fuel waste results by leaving reverse lever down when the train picks up speed. Sand pipes must be kept open and lined up with rail so as to prevent slipping as much as possible as many bad trips and poor fuel performances are directly traceable to engine slipping badly at the beginning of a trip.

Co-operation between the engineer and fireman is absolutely essential to good fuel performance and good railroading. The fireman should be advised where the

train will stop for water or of any other stop he may not know about, so the fire can be regulated accordingly.

With reference to co-operation of the engine crew, I want to relate an occurrence that came under my observation a number of years ago. A 1300 class engine was pulling a train up a steep grade about one mile in length, when about half way up, the fireman started to put in a fire and after putting in two shovels of coal he noticed the engineer shut off the injector. He stopped putting in coal and got on his seat, knowing that the fire already in the fire box would take the train to the top of the grade, whereas had he continued to put in the balance of the amount of coal usually put into the fire box of an engine of the size of this one at one fire, the engine would have raised pop valves and wasted steam. He saved himself the labor of putting in four or five shovels of coal and saved this amount of coal for the railroad company. In mentioning this incident, I do not want to leave the impression that this is an isolated case, as I only want to convey my idea of what is close co-operation between the engineer and fireman and picked this one out of quite a number of similar cases.

The careful preparation and upbuilding of the fire when getting engine ready at the roundhouse should receive the fireman's closest attention. This refers both to hand or stoker fired engines. Fire should be several inches heavier at sides, back and flue sheet than in the center of the fire box, as air coming into ash pan will force its way through where fire bed is thinnest and if this happens to be at either side it will rush up along the sheet towards the crown sheet and will cool the water next to the sheets which we are trying to boil and if the thin place would be next to the flue sheet we would merely be pulling cold air into the fire box and through the flues, which would have the effect of cooling the water surrounding the flues.

Coal is sometimes wasted by forcing the fire to get the engine hot with injector working when there is plenty of water in boiler to shut off injector and allow the engine to get hot without any undue forcing or crowding. The reason for this is found, however, to be mostly due to injectors being hard to put on, account water valves being hard to regulate or injector hard to prime and rather than spend the time to shut injector off and then put to work again, the fire is forced.

One of the outstanding items which affect fuel consumption and which is entirely under the control of

the engine crew is the work of the injector and the height of water carried in the boiler. Injectors should be of proper size and placed where easy to operate by the engine crew. Water valve especially should receive preferred attention so supply of water delivered to the engine can be easily regulated. If these conditions exist, the engine crew can then save fuel by intelligent handling of the injector. Water carried high in a locomotive boiler, either saturated or superheated engine, is a waste of fuel, as the nearer to the throttle valve the water is carried the more moisture steam contains and, of course, the less work it is able to perform, or in other words, it will take more moist steam to do the same work than it would dry steam and consequently more water has to be boiled to furnish the wet steam, than the dry, and more fuel has to be burned to do that. The reason why most men are inclined to carry a high water level is because they are influenced by the theory that the engine will steam better on account of the comparatively cold feed water from the injector not affecting the temperature of a full boiler as much as it will a small amount of water in the boiler. This theory, however, does not hold good in a locomotive boiler as only the amount used needs to be replaced and if we use less water by using dry steam it should be perfectly plain that to heat it, less fuel is used.

Another item worth mentioning in this connection is the tendency some men have of trying to increase the amount of water in the boiler, at the expense of their steam pressure just before reaching heavy grades, losing sight of the fact that by so doing they are also decreasing the temperature of the steam that is being delivered to the cylinders of their engine. Steam at 200 lbs. boiler pressure is about 388 degrees Fahrenheit and decreases in ability to perform work in the same proportion as it decreases in heat and it stands to reason if we decrease the pressure to 180 lbs. the reverse lever will have to be dropped to perform the same work that was performed with the lever hooked up at 200 lbs. pressure, with the result that greater amount of steam and water and, of course, a greater amount of fuel to heat it must be used. We see, therefore, that it is best to keep a maximum steam pressure on the engine when ascending heavy grades.

Men on superheater engines should not carry too high a water level in boiler on account of the danger of making an auxiliary boiler out of the superheater system which is calculated to have steam of from 550 to 625 degrees Fahrenheit perform work in the cylinder and which will, if high water is used, deliver

steam of only about 400 degrees Fahrenheit to the cylinders. In my opinion, it is good practice to leave a terminal, water tank or any other place where the train has stopped for sometime, with boiler as full of water as the engine will stand, to start the train and not carry any water into dry pipes and cylinders, having first put in fire or at least have fire in such condition that it will not be necessary to open fire door while the train is being started, as this practice is hard on flues and fire box sheets. After the train is under way and the engine shows signs of getting hot and the fireman knows his fire is in good enough condition to allow him to put on injector, without the steam pressure dropping back from its effect, the injector should be put on and cut down as fine as it will work and increased only if found necessary in order to maintain a water level of somewhere between one-third and one-half a glass full of water in the boiler, aiming to get to the next water tank or station stop with water low enough in boiler that injector can be kept working and fire can be kept burning brightly, by slightly cracking blower valve without raising pops, and engine will again be ready to leave with sufficient water in boiler and fire in good condition, injector to be shut off before train is started.

These suggestions are intended for engines burning coal. On oil-burning engines it is probably the best practice, if possible, to reach any water tank or station stop with a sufficient amount of water in boiler, that injector can be shut off on arriving, as fire can easily be controlled on oil-burning engines.

Superintendent P. W. Conley Submits Some Fuel Figures

Superintendent P. W. Conley of St. Louis, submits these interesting figures of fuel saving records made on his division:

Engine 3,746, Engineer Hynes, Fireman Minor, 8 hours, 492 gallons.

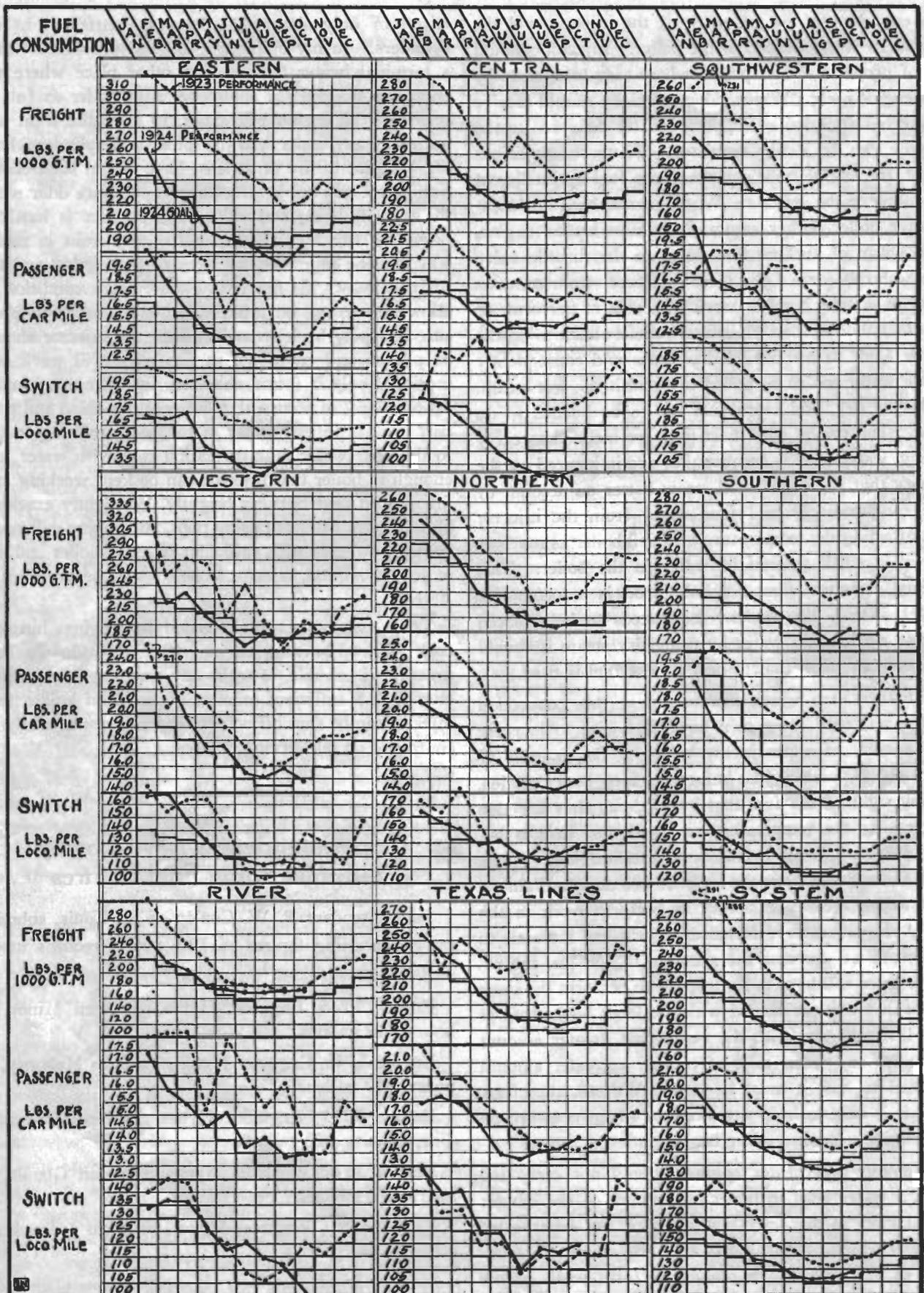
Engine 3,745, Engineer Hynes, Fireman Mahoney, 8 hours, 419 gallons.

Engine 3,751, Engineer Hynes, Fireman Boergardine, 8 hours, 420 gallons.

Engine 3,742 Engineer Hynes, Fireman Glandt, 8 hours, 376 gallons.

Engine 1,240, Engineer Hynes, Fireman J. Gardine, 8 hours, 340 gallons.

Engine 3,742, Engineer Hynes, Fireman Sims, 8 hours, 304 gallons.



Fuel Chart for October



FRISCO BABIES

1—Francis Edward Mangan, age 6 months; son of I. A. Mangan, chief yard clerk, Springfield, Mo. 2—George Allen Westland, age 4 months; son of A. C. Westland, West Shops, Springfield, Mo. 3—Frieda Lou Robertson, age 3½ years; daughter of Fireman Robertson, of the Texas Lines. 4—Lenward E. and James R. Hall, aged 5 and 3 years respectively; sons of Andrew J. Hall, Frisco fireman, Tulsa, Okla. 5—Oscar Franklin Barnes, age 6 months; son of H. O. Barnes, car inspector, Vinita, Okla. 6—Rithma Howell, age 5 years daughter of P. L. Howell, report clerk, Freight Office, Birmingham, Ala. 7—H. J. Green, Jr., age 8 years; son of H. J. Green, Bessemer, Ala. 8—Gordon Vickrey, age 3½ months; son of Amos Vickrey, ticket clerk, Hugo, Okla. 9—Son of Correspondent C. J. Anderson, age 11 months. 10—W. M. Lewis, Jr., age 6 years and Winnifred, age 2 years; children of W. M. Lewis, Frisco agent, Verona, Mo. 11—John Franklin Wade, age 4½ months, son of Brakeman J. C. Wade. 12—Emil Junior, age 3½ years and Nancy Cora, age 8 months; children of E. M. Hatfield, Frisco Shops, Sherman, Texas.

Old Magazine Carries List of Many Frisco Pioneers

J. W. Morrill, supervisor of safety, brought to the office of the magazine recently a copy of "Car, Cab and Caboose," a magazine formerly published in St. Louis in the interest of railroad men of all lines.

The edition bears the date of July 1, 1884, and is "Volume One, Number One." In its introductory notice it is said, "Car, Cab and Caboose will from time to time publish a list of the train men employed on various railroad divisions of the country, and thus become a medium through which friends long separated by time and distance can learn of one another's whereabouts and doings."

In keeping with this announced policy, on one of the pages of the magazine is published a list of trainmen of the Frisco Lines, and it is interesting, indeed, to scan those lists, especially so would it be to a veteran of the road.

Of the men listed, Mr. Morrill is able to give the present abode and occupation of many, as follows:

A. Otterson, now a real estate man in Springfield, Mo.; J. L. Toomey, on the Frisco pension list and living at Rolla, Mo.; Frank Carrigan, still in active service on trains 9 and 10; L. Coover, also in active service on 3 and 4; J. J. Murphy, now a marshal in the office of the United States District Judge at St. Louis; Dan Mahoney, conductor on a Union Pacific passenger train; E. E. Williams, senior conductor on the East End of the Missouri-Pacific; Ira Wightman, paymaster's office of the Frisco; John Weckerley, living at Newburg, Mo., and on the pension list; Thomas Hasler, pensioned and dividing his time between Springfield and his lake resort home in the Ozarks; Charles Hesmith, a leading soda water manufacturer of East St. Louis; J. W. Morrill, safety supervisor with the Frisco; W. H. Smith, pensioned and living at Pacific, Mo.; W. A. Noleman, now pensioned and living at Springfield, Mo.; C. V. Cass, now manager of the Westinghouse Air Brake Company's Pacific Coast interests; E. N. Walker, in active service on the Western Division; W. B. Dafe, pensioned and living at Neodesha, Kans.

A reminder of the pre-Volsteadian

days is contained in the pages of the magazine in the form of an advertisement from an Oakland, Calif., liquor dealer, whose place was called the "Pullman Palace Saloon" and whose advertisement, in part, read:

"Know ye that by the payment of \$146 I am licensed to retail intoxicating liquors at my saloon. To the wife who has a drunkard for a husband, or a friend who is unfortunately dissipated, I say emphatically, give me notice of such case or cases in which you are interested and all shall be excluded from my place. I pay a heavy tax for selling liquors, and I want it distinctly understood that I have no desire to sell to drunkards, minors, the poor or the destitute. There are gentlemen of honor and men of means who can afford such luxury, and it is with those only that I desire to deal."

One of the contributors to the magazine evidently has been "enjoying"—with emphasis, a vacation trip in Mexico for he writes, we have no doubt entertainingly, for we did not read further than the heading of, "Kissing a Mexican Beauty."

Safety First was even then a vital subject with the railroads and considerable space is devoted to stories of railroad accidents and what might have been done to avoid them.

There is a story of "Colonel Bob" Yorkston, former well-known St. Louis journalist, in the days when there were still journalists.

A story by a veteran engineer of those days is filled with interest. Among other things, he tells of the first engine on which he rode which carried a cab. "I remember," says the veteran, "when cabs were first introduced. It was on the Pennsylvania road which then belonged to the state. The engineers all raised a great howl at the change and there came near being a strike. They said the houses were death traps and if an accident happened there would be no way of escape. They soon changed their minds."

Printers in those days had their troubles just as they still do, for an apology is contained in a paragraph which reads: "The magazine is one day late but it was unavoidable."

Here are a few questions that we should each think over and ask ourselves:

Do I always have to be told what to do next?

Do I work faster than others?

Do I make fewer mistakes than those around me?

Do I understand the significance of the work I am doing each day and am I doing it to the best of my ability?

The only way to be a "world beater" is to start by out doing the man next to you. To do that we should each ask ourselves the above questions and see what the answer is. We cannot start as leaders but as followers. By out working the other man we place a higher rate on our price card. Speed is no good without accuracy. A shopman that has to be watched, or a stenographer or comptometer operator that is inaccurate is just a nuisance. Our supervisors should not have to waste their time by checking everything we do. The work we have to do may seem very small and insignificant to us, but it is a link in the great chain that keeps the railroad world moving. If our link is weak or imperfect, the chain is weakened just that much and sometime we will be replaced by a stronger link.

A man's mind dictates his every action. The only way to be great is to be right and the only way to be right is to "THINK RIGHT."

Why the Frisco Is a Great Railroad

By G. G. BECKLEY, Claim Agent

When a boy I lived at Paris, Texas, and in those days there were no railroads in that part of the state. My father ran a stage line from Paris, Texas, to the Mississippi River, carrying the U. S. Mail and passengers to the steam boats, and when the Frisco built into Paris, over the Ozark and Boston Mountains, it was a wonder, and was what revolutionized that part of the country.

The first trip I made over it was with a cattle train, and at that time eighteen cars of cattle was a full train; now it consists of from forty to sixty cars, and the trains at that time had to be double-headed over these mountains. I thought it the best railroad on earth, and I knew the scenery the very best, and am still of the same opinion.

The Frisco has been kind enough to furnish me with transportation enabling me to get a few vacations. I have seen on my trips many mountains and plains but have seen none that appeal to me like the scenery along the Frisco Lines.

The Frisco has been good to me, having given me pay checks pretty regularly for more than thirty years.

Why should I not think it the best railroad on earth?

"Think Right"—a Slogan Which Means a Great Deal

By R. W. HARPER

"Think Right," is a slogan that has been adopted on the Southwestern Division and is to be seen printed in large letters over the entrance to the shops and master mechanic's office at Sapulpa.

There is no truer saying than one which we hear every day, "We get out of life just what we put in it." We

can only put into our lives what is in our minds. This applies just as well to the railroad people as it does to those in other professions and walks of life. The price tag is not on our work but on us each individually. We each hold a tag and can mark our price just what we desire that it should be.