

Address of General Manager Fraser at the International Fuel Convention

"I have very thoroughly enjoyed this meeting, and sitting in here I have had the feeling that I was in one of our division fuel meetings. I have heard some wonderful things said here, things that were worth while, things that were practical and things that were good. I listened yesterday to a paper read by Mr. Stevens, and this morning I am looking into the faces of some real honest-to-goodness railroad men. When I heard that paper, I certainly knew that it originated in the brain of a man who had been through the mill of experience, a man who knew what he was talking about.

There is one thing in this meeting that has impressed me. I have heard a great deal said about co-operation and about the operating departments getting in on fuel conservation. If there is any one thing in connection with this meeting that has surprised me, it has been the expressions indicating that on some railroads the operating departments are not in on fuel conservation. You have heard considerable said about the superintendent getting in on it. I can only tell you some of the things we are doing on the Frisco Railroad.

Our superintendents are holding fuel meetings with frequency. We invite into those meetings the conductors, engineers, brakemen, fireman, mechanical department officers and employes, and the public. When I go over our railroad and an assistant superintendent gets on my car, one of the first things he commences to tell me about is what he is doing with fuel and what he is doing with overtime and tonnage, and that is the condition that you must reach in order to get real fuel conservation. I meet our engineers and our firemen. They tell me what they are doing, how many tons of coal they use, and they ask me most frequently questions that are very difficult for me to answer. As a matter of fact, frequently I cannot answer. And when you have that condition, when your engineers and your firemen, your conductors and your brakemen are putting questions to you that are hard to answer, you are getting somewhere.

You have all heard, I know I have from a boy, and you gentlemen have, that you need to keep the tonnage up and the overtime down in order to have successful railroad operation. It used to sound like a joke, but it is not. If you will go forward into it thoroughly, you can do it.

Another thing is this: No business can be successful unless you know every day what you are doing, and what you accomplished the day be-

fore, what it cost you. On the Frisco road we have a system, our 1191 Local Report. Each morning our superintendents know exactly what it cost them to operate their division the day before. We general officers get that report from three to four days later, due to the process of consolidation.

But now, talking about keeping the tonnage up and the overtime down. I received yesterday in my mail a report for the 22nd day of this month. For the first twenty-two days of this month, as compared with last month, and also compared with June, 1922, which was the banner operating month of the Frisco road. We started out in March to beat the June, 1922, figures, and have had a lot of hard work to do it. I am happy to tell you that in the month of March we undermined the June, 1922, figures. In the month of April we undermined the March, 1924, figures, and also in the month of May we are undermining the previous month. On the 22nd day of this month our gross tons per train mile was eleven hundred and eighty-seven as compared with eleven hundred and sixty-one last month and with ten hundred and ninety in June, 1922; an increase of ninety-seven tons. Here is our fuel—one hundred and eighty-eight pounds per 1,000 G. T. M., as against one hundred ninety-eight last month and as against one hundred ninety-six in June, 1922.

Our overtime is 12.2% as against 13.7% previous month and as against 16.8% in June, 1922, the banner month of the Frisco Railroad.

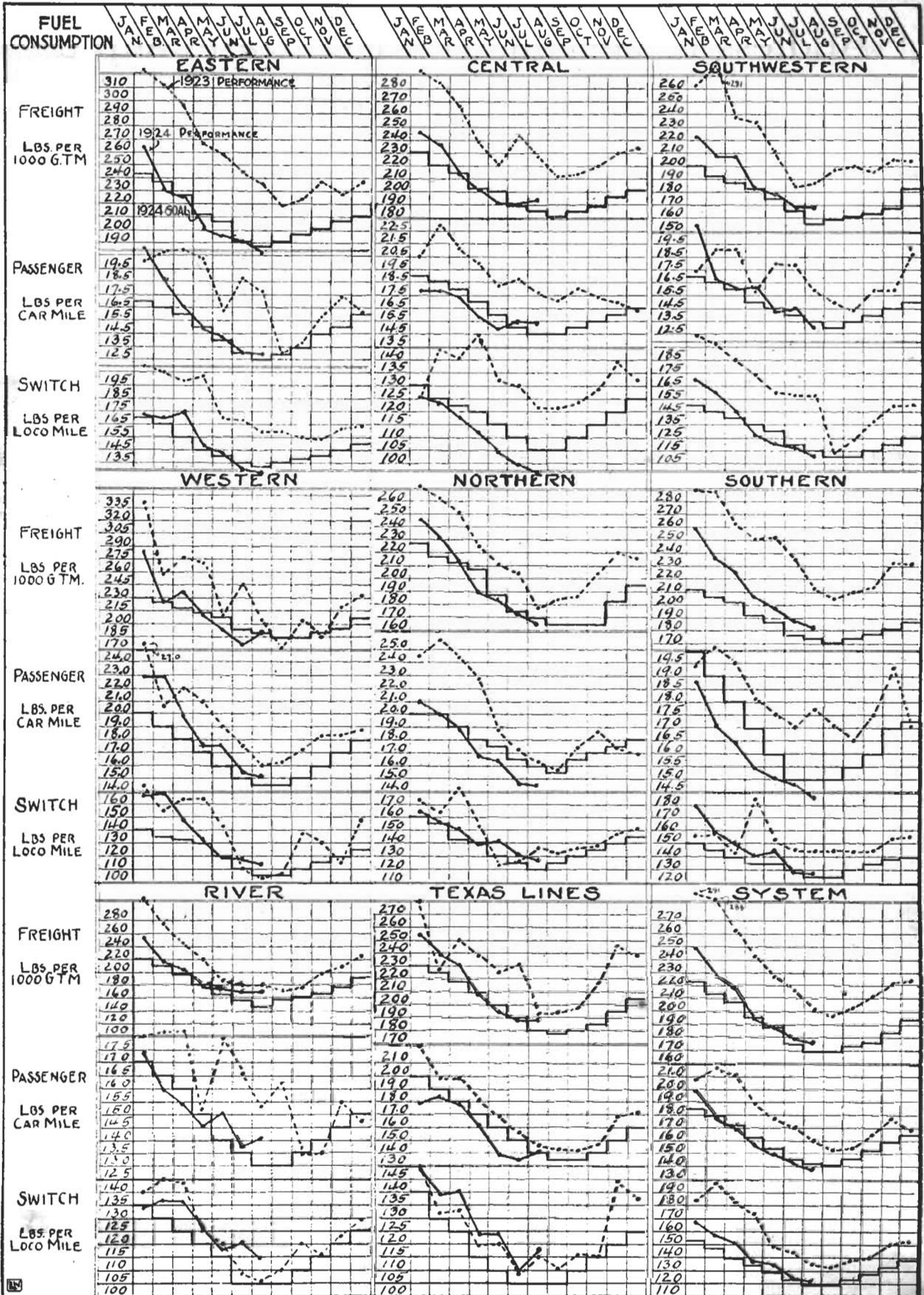
That means this—the tonnage is increasing and the overtime is decreasing, and our pounds of fuel are also decreasing. That is the thing you gentlemen here are trying to do. When you do that you are well on your way to successful operation. All of our freight trains are moving, through, local and mixed, 13.3 miles per hour as against 13 miles last month, and as against 12.7 in June, 1922, which means a faster movement of freight trains, less overtime, more tonnage, less fuel.

The reason we are getting these results are these: On the Frisco road we have not anything but co-operation. All departments are working hand in hand. There are no alibis on our railroad and we do not want them. We will not tolerate them, we do not enjoy them. We want every man to acknowledge his failure and every man who has some success we do not fail to tell him about it. Today with oil burning passenger locomotives, we are running them between

St. Louis and Oklahoma City, a distance of 542 miles. We are running passenger engines through from Kansas City to Ft. Worth, a distance of 571 miles. We are running coal burners from Kansas City to Memphis, a distance of 484 miles. And I am not going to take your time to tell you what that means. But you gentlemen who are practicing and studying results in every direction know that they are very far reaching. They are the most economical things to be done on the railroads. We are operating, as you may know, our Santa Fe type freight engines between Springfield, Mo., and St. Louis, a distance of 240 miles. We are putting these engines through Newburg, Mo. (Intermediate terminal) with an average of seven minutes detention on the fire, and it is seldom that we keep these engines in Newburg to exceed thirty minutes. We have figured out what that means to us in savings, and we know that if you and I will give some thought to that practice it is one of the biggest coal savers that you can consider.

I was impressed by that portion of Mr. Stevens' paper yesterday about getting trains out of terminals when called. On our railroad we have a daily report. It comes on my desk every morning and shows the average time all of the freight trains use at the terminals in getting out. We have had it sub-divided. We have averaged the time from the time the engines are ordered until the mechanical department delivers it. Then we have averaged the time from the time the transportation department gets the engine until the train moves. When we first inaugurated that report the delays were quite heavy, but we have found out that by keeping close tab and check on it that the delays gradually went down and every terminal man on the railroad knows that if his average shows too high somebody is going to write him a letter and he is going to tell us about it. It is a wonderful thing how all of these men warm up to you and how they get into the game and how manifestly interested they become until it becomes, as a gentleman said yesterday, a rivalry. When you get that condition that just explains to you the reason for getting good results.

Do You Know of Good
Fuel Records?
We are anxious to learn
of all unusual "runs."



FUEL CHART FOR AUGUST

"Type D" Duplex Stoker Firing and Something of Stoker Disorders

By P. J. MOORE, General Foreman, Ft. Scott, Kansas

Preparation for Trip: Before a stoker can be operated successfully the fireman should know the location and the purpose of all the operating levers, valves, gauges, and oil feeds to the different bearings.

When coming on duty the parts of the stoker that would require lubrication should be oiled. Assume that the tender slides are all in place and no coal entering the conveyor trough, start the stoker and make a test of the parts by which it is controlled. The conveyor drive and reverse should be tested by placing the reverse lever in drive position, in reverse position, and then in neutral position, noting whether the lever moves freely and whether the conveyor drive and reverse can be reversed and stopped. Neutral position is important because the conveyor screw must be stopped before foreign matter can be removed from the transfer hopper on the elevators cleaned out. Then try the neutral positions on both elevators, as it is often necessary to cut out one side or the other, and the drive and reverse positions as well. Then, too, see whether the engine can be stopped and started by the operating lever.

After testing thoroughly the conveyors and the elevator screw controls, the stoker can be slowed down or stopped and the steam valve to the distributors opened. The steam should blow freely through all the holes in the jet nozzles, as otherwise the coal will not be properly distributed. Any holes which are stopped up should be cleaned out. The condition and the position of the distributors should be noted, because a distributor that is too low or one that is badly worn or burnt, will not distribute coal properly.

After it has been found that the stoker operates properly, the fire should be built up by hand to about the same depth as if the engine were to be hand-fired. Any banks should be broken up and scattered over the grates. If the fire is too thin, small amounts of coal should be applied with the shovel. When the engine is ready to start the train, the fire should be level, light, bright and well burned through. Before coupling on to the train the first tender slide should be opened and the stoker run until coal appears at the distributor elbows. The coal will then begin to go into the firebox as soon as the stoker is started.

Operating the Stoker: When the engine has started the train, the stoker should not be started for a few min-

utes. This allows the coal in the fire box to become well burnt; the exhaust will remove the fine dirt and ashes from the fire, and a clean, bright fire will be obtained before the stoker is started. The stoker should now be started and allowed to work only a few minutes, after which it should be shut off and the fire carefully examined to see whether the entire grate surface is being lightly sprinkled with coal. The stoker should not be run rapidly, especially when starting out. For the first mile or so the stoker should be stopped frequently, the fire examined for unequal distribution of coal, and the pressure on the steam jets regulated so that too much coal will not be fed to any one part of the fire. If there is too much pressure on the jets, the coal will be thrown to the front end of the firebox and the fire at the back end will become too light. Cold air will then be admitted through the back grates and the steam pressure will drop.

If too little pressure is used on the jets, the fire will become too light on the front grates and too heavy on the back grates. Great care should, therefore be given to the jet pressure so that the coal will be scattered evenly.

The pressure on the steam jets depends on how the locomotive is working and on the size and condition of the coal. Less steam-jet pressure is required when the locomotive is working hard, as the heavier exhaust assists in carrying the coal into the firebox. When the coal is fine or dry, less steam-jet pressure is required than when the coal is wet.

The fire should be carried as thin as possible. Under average conditions the fire should be 5 or 6 inches deep at the fire door and 3 or 4 inches deep at the flues.

The shovel should not be used after the stoker has been started, as green coal will fall on green coal and the resulting bank in the fire will necessitate the use of the hook. The exhaust at the smokestack should be watched closely. Dense black smoke is an indication that too much coal is being fired, and the stoker should be run more slowly. The coal should be watched as it runs from the tender into the conveyor for rock, to see that sulphur, pieces of wood, or iron, are removed before they enter the trough. Most of the stoker failures are caused by clogs of foreign matter in the coal. The fire should be starved as much as possible and only enough coal fed to maintain the steam pressure. If more coal is feeding to one side of the firebox than to the other, raise the hopper door and move the dividing rib

toward the side that is receiving the most coal.

The elevator on the thick side of the fire may also be placed in neutral position for short periods from time to time, and the amount of coal fed to this side of the firebox decreased. As the conveyor screw will carry the coal to the transfer hopper faster than the single screw will elevate it, an elevator should not be stopped for any great length of time or the screw which is operating will stall because the hopper will become jammed with coal.

When approaching the top of a hill or a siding or other points where the throttle is to be closed, the stoker should also be shut off and the fire kept up by hand while drifting down hill or standing in the siding. The reason for shutting off the stoker is that the distribution of the coal is assisted by the draft when the engine is working. There is little or no draft when the engine is drifting or standing; hence, if the stoker is worked, the coal will bank in the firebox and may cause clinkers.

The fire should be maintained with the shovel when standing, drifting or doing short switching. The shovel should also be used to hand-fire spots in the firebox which may be thin or undersupplied by the stoker.

On account of the thinness of the fire, greater care should be exercised when shaking the grates than is required on hand-fired locomotives. If practical, the grates should be shaken only when the locomotive is not using steam. When approaching grades the fire should be properly prepared by speeding up the stoker to meet the heavier demands. In the event of a clog which stops the stoker, and which cannot be quickly remedied, the fire should be maintained by hand until the obstruction is removed.

Stoker Disorders

Distributors worn or are not the proper height: If the distributors are worn or are not the proper height, the coal cannot be scattered evenly by regulating the jet pressure. The action of the steam in blowing the coal through the distributors causes the back end of the distributors to wear and become dished out. The steam jet, when it strikes the depression on the distributor, is thrown upwards and the coal will not be thrown far enough ahead in the firebox, but will bank near the door sheet. The distributor should be removed and the hole filled in or a new distributor applied.

If the distributors are allowed to

hang too low, the coal will bank about two feet from the back sheet. On the other hand, if the distributors are too high, the coal will be carried in larger quantities to the front end of the firebox, and will not be distributed, as it should be, over the back section of grate.

Holes in Jet Nozzles Stopped up: If any of the holes in the jet nozzles become stopped up with scale, the coal will be blown either toward the side sheets or the center of the firebox, depending on which holes are plugged. A plugged-up jet nozzle can be cleaned by disconnecting the union on the steam pipe below the jet, loosening the set screw, and removing the nozzle. The holes can also be cleaned out sometimes by introducing a small wire into the peep hole in the elbow.

Broken Pawls or Pawl Springs: A broken pawl in an elevator or conveyor drive and reverse is usually indicated by a knock in the casing. A broken spring usually causes a rattling, snapping sound in the casing. If both the pawls or springs break in an elevator casing, the casing and, therefore, the screw will either not turn at all or will turn irregularly whenever the broken or loose pawl happens to catch. Broken pawls and springs in the conveyor drive and reverse will affect the conveyor screw the same as an elevator screw.

Operating Rod Will not Stay in Central Position: If the operating lever will not stay in a central position, the catches or the catch spring are broken or worn or the groove in the operating valve stem is worn. Temporary remedy on the road, wire the operating rod in position temporarily.

Elevator Pawl Shifter or Reverse Lever Cannot be Readily Moved to Reverse Position: If the elevator pawl shifters or the reverse lever cannot be readily moved to reverse position, the steam pressure in the engine cylinder is probably holding dry pawls tightly against the teeth of the ratchet wheels. The remedy is to reverse the steam piston with the operating rod.

Engine Runs Slowly or Stops: The stoker engine will run slowly if the packing ring on the steam piston leaks badly. If the piston packing is blowing or if the engine is not receiving enough lubrication. The engine will stop if the reversing rod is bent or the striking points worn or if dirt is permitted to accumulate in the rack housing.

Leaky piston packing is indicated by the escape of steam at the drain pipe at the end of the gear rack housing. This disorder will cause the engine to make a slow stroke when the conveyor and elevator screws are reversed. The dust that enters the gear rack housing mixes with the oil and forms a hard deposit at the entrance housing. The dirt as it accumulates is pushed by the rack to the ends of the casing with the result that the rack is unable to complete the stroke. The remedy is to remove the cover from the gear rack housing and

to clean it out. The exhaust pipe which leads from the engine to the smoke box should be examined and cleaned out at regular intervals, if this pipe becomes plugged, the engine will stop.

Tank Unit Fails: If for any reason the part of the stoker on the tender should fail, the engine can still be stoker fired by raising the door in the deck over the transfer hopper and shoveling the coal into the hopper, care should be taken not to feed large lumps.

Clogs

Precautions to be Observed: Before trying to remove obstructions from or doing any work on the stoker, the steam should be shut off the stoker engine by closing the valve in the steam line and the piston should be returned to dead position by lowering handle on operating rod to bottom position on, however, this handle should be raised on the United States standard locomotives. The hand should be kept out of stoker elevators and conveyors and bars, rods, or levers, should be put in these parts until the precautions mentioned are observed, care should also be taken not to step in the stoker conveyor.

Locating Clogs: The stoker may clog and stop because of iron, wood, slate, or other foreign matter in the coal, or the stoker may be stopped by a hard lump of coal which can be broken up. Therefore, when the stoker stalls, the first thing to do is to open the steam valve No. 7, which is the large valve. The opening of this valve increases the pressure in the engine and forces the obstructions through the crushing zone where it can be removed by opening the door in the transfer hopper. If the stoker has been stopped by a large lump of coal, the extra pressure will cause it to be crushed.

The trouble will have to be located if the stoker will not start with the increased pressure, to do so the pressure to the engine should be shut off, the operating valve lever should then be moved to its lowest position. This stalls the engine with the piston at the steam head of the cylinder. The reverse lever is next placed in center or neutral position, thus cutting out the conveyor screw. The operating valve is then placed in center position and steam valve is opened.

If the elevator screws work, the clog must be in the conveyor trough. If the elevator screws do not work, either one or both must be clogged, because the conveyor screw is cut out in neutral position. The elevator screw which is clogged can be located by trying the pawl shifters and noting whether they can be raised to reverse position. If one of the shifters cannot be raised, the trouble will usually be found in that elevator because the screws when it stops will cause the pawls to wedge in the teeth of the ratchet wheel.

Removing Clogs: If the elevators work, thereby indicating that the conveyor screw is clogged, the screw

should be reversed but it should not be run backwards for more than three revolutions, steam valve should then be closed before attempting to locate and remove the obstruction from the conveyor trough. Clogs in the conveyor trough usually occur in the crusher zone. In order to find the clogs the coal should be shoveled out of the crusher, clogs in the elevators usually occur at the bottom of the elevator casing doors and cause the obstructions to catch between the screws and the bottom of the door. An obstruction at this point can be moved by raising the transfer hopper door in the deck. If the obstruction is in the elevator, the elevator screw should be reversed, if this will not remedy the trouble the elevator casing door should be removed and the obstruction taken out.

July 22—Engine 4,020, train No. 535, Sapulpa to Francis (102 miles), Engineer Samer, Fireman Chapman, 168,000 G. T. M., consumed 10 tons of coal or 119 lbs. coal per 1,000 G. T. M.

July 28—Engine 4,018, train No. 535, Sapulpa to Francis (102 miles), Engineer Calvin, Fireman White, 185,367 G. T. M., consumed 11 tons of coal or 119 lbs. coal per 1,000 G. T. M.

August 4—Engine 4,125, train 2d/434, Sapulpa to Afton (90 miles), Engineer Gardner, Fireman Schneider, 195,414 G. T. M., consumed 1,465 gallons of oil or 7.5 gals. per 1,000 G. T. M., which is equivalent to about 88 lbs. of coal.

August 7—Engine 4,122, train extra north, Sapulpa to Afton (90 miles), Engineer Alexander, Fireman Higginbottom, 208,236 G. T. M., consumed 1,512 gals. of oil, or 7.2 gals. per 1,000 G. T. M., which is equivalent to 85½ lbs. of coal.

August 7—Engine 1,290, train 136, Amory to Memphis (127 miles), Engineer Beshears, Fireman Crawford, 196,348 G. T. M., consumed 1,122 scoops of coal or 78.7 lbs. coal per 1,000 G. T. M.

August 12—Engine 1,055, train 104, Jonesboro to Thayer, (80 miles), Engineer Schwartzbach, Fireman C. H. Bauer, 560 Passenger Car Miles, 369 scoops of coal, or 9.2 lbs. coal per passenger car mile.

August 14—Engine 1,286, train extra north, Chaffee to St. Louis (144 miles), Engineer Hilderbrand, Fireman Gill, 332,029 G. T. M. consumed 102.5 lbs. coal per 1,000 G. T. M.

August 7—Engine 627, train extra east, Hugo to Hope (121 miles), Engineer Reynolds, Fireman Bush, on duty 10 hours, handled 129,000 G. T. M., consumed 10,000 lbs. coal or 78 lbs. coal per 1,000 G. T. M.

August 8—Engine 710, train extra south and north on Cohturn (224 miles), Engineer Burris, Fireman Cowan, on duty 15 hours and 45 minutes, handled 167,000 G. T. M., consumed 12,000 lbs. coal or 72 lbs. coal per 1,000 G. T. M.

RAILWAY PURCHASES MAINTAIN INDUSTRY

CARRIERS CONSUME ONE-FOURTH OF THE COAL AND LUMBER PRODUCED AND THREE-TENTHS OF THE STEEL

One ton out of every four tons of coal mined in the United States is used by the railroads. One miner out of every four gets his entire living from the railroads.

Of every ten tons of steel manufactured the railroads take three tons. Three out of every ten men employed in the steel mills are supported exclusively by the railroads.

Of every 4,000 feet of lumber sawed annually the railroads take 1,000 feet. The railroad is the only visible means of support of one-fourth of those employed in the lumber industry.

Of every hundred gallons of petroleum pumped from American wells the railroads take 11 gallons.

Of every dollar the railroad takes in it pays out directly 44 cents in wages and 35 cents for supplies. More than five cents go to pay taxes of the government and 12 cents to the bank for interest on borrowed money at rates varying from 3½ to 7 per cent. The New York Central is paying an average of 4.3 per cent interest.

That leaves about four cents out of each dollar the railroad takes in to pay the wages of the stockholders'

money which works for the railroads. For the five years ending with 1922 the average was less than four cents.

That the railroads are the country's best customers was the declaration made at Atlantic City by Robert H. Aishton, president of the American Railway Association, before the convention of railway purchasing agents. Mr. Aishton's figures showed that during 1923 the class 1 carriers purchased directly from the industries of the country, fuel, materials and supplies to the value of \$1,783,793,000.

"Most of this," he declared, "went into the operation and maintenance of the railroads and only a small part of it went into the capital expenditures for equipment and additional facilities, for which in 1923 there was actually paid \$1,059,000,000, a large part of that sum being for lump-sum contracts which included both labor and materials."

Mr. Aishton submitted detailed reports covering purchases in every field. His report regarding fuel made note of total expenditures of \$617,800,000 for fuel, of which \$519,007,000 was for bituminous coal, representing 28 per cent of the total

amount produced in the country; \$18,195,000, or 5.2 per cent of total anthracite; \$75,867,000, or about one-fifth of the total output of fuel oil, and \$4,731,000 for other fuel, including coke and gasoline.

Fifteen per cent of the total forest products output of the country was purchased by the railroads, whose bill to this industry amounted to \$232,511,000, of which cross ties cost \$124,743,000, other timber and lumber \$99,798,000 and poles, posts and other forest products \$7,970,000.

Direct purchases of iron and steel products called for an outlay of \$464,955,000, including \$80,965,000 for steel rails alone and \$383,990,000 for iron and steel castings, structural iron and steel and other articles. Purchases of copper, zinc, lead, babbitt, etc., amounted to \$57,245,000; lubricating oil and grease \$15,678,000 and cement \$6,120,000.

A lump sum of \$344,394,000 was assigned to purchases of other materials, such as ballast of all kinds, groceries, meat, canned goods, supplies of various kinds, brooms, matches, pencils, typewriters, paper, etc.

OPTIMISM VERSUS PESSIMISM

By SAM A. HUGHES, Apostle of Good Cheer

These are certainly hard times, and it is not an innovation, for, I venture the assertion that many of us here today have in the past faced grave industrial conditions, and without appearing pessimistic, let me say that we may have to endure similar experiences in the future. We have fought the battle of human affairs, and at times all seemed dark and hopeless, but we appear to have weathered the storm and did not weaken or despair, and clad in industrial armor, we shall again go forth to conquer, fighting under the Banner of God, the American Flag and the Golden Rule, fully endowed with that dogged determination to win, and there shall be no such thing as fail.

True, Hard Times have knocked at every man's door, including every line of human endeavor. So, it is hard for the executive who must compare costs with profits and reduced business activity; hard for the employee who is confronted with a decreased demand for his services and high cost of living; hard for the salesman who must be content with receiving hand to mouth orders from the Buyer; hard for the professional man who cannot apply his brain power and his serv-

ices without due compensation; hard for the railroads and the Transportation Companies, in general, whose ever increasing obligations and decreased net earnings make for discouragement, not only to the men in charge of operation, but likewise reaching out to the bond holders and the stock holders together with the millions dependent and interdependent upon the success of the Transportation Companies for a livelihood; hard for the farmer who tills the soil and without whose efforts we perish from the earth, the man who must remain behind the gun guarding against the elements, crop failures and constant fluctuation in prices, to say nothing of his exploitation by the wily politician seeking his own self-aggrandizement at any cost.

But old Hard Times will soon pass away; we must look the conditions square in the face, buck up and go forward, emulating the methods of men who have achieved success in the past in legitimate enterprises, and at the same time add new ideas and new methods in production, keeping an eye ever focused upon the present and upon the future, bearing in mind the fact that many of the great fortunes

of today, many of the largest and most successful organizations in the world and the successful men of the hour, are but the products of Hard Times.

No fortune, no organization, no great industrial success founded upon easy times and false prosperity, ever endured. Blind optimism will not answer. Slogans will not cure it, only good, common sense, properly applied, sincerity of purpose and hard work will overcome the present adverse conditions. Hard Times only stimulate and give us renewed energy to go forward, firm in the faith.

Go to it, men and women of the United States of America, singing "Onward Christian Soldiers," as you march, holding your banners high aloft as you approach the Beacon Light in the Ocean of Life, where the Isles of Success and Happiness are smiling as they beckon you to the sunny shore.

**SMILE!
IT WON'T HURT—
TRY IT.**