

Regarding Coal Consumption.

G. W. Colson, engineer, Oklahoma City, Okla., writes the following communication regarding Mr. Nixon's article in the last issue of The Frisco-Man upon Coal Consumption:

I note in THE FRISCO-MAN of March 11 your letter on coal consumption. I beg to say that it is the height of every man's ambition, or should be, to try to reach the point of economy on both right and left side of an engine.

First, the length and size of the scoop; second, the apron and shoveling sheet should be considered and should always be kept in perfect condition, as great loss of coal is had by men having imperfect places to stand; third, the water connection, such as squirt hose, should be kept in perfect condition. We derive a greater per cent from wet coal than we do from dry coal, of which I will later on explain in my letter.

Coal, as coal, will not burn. It is the gases in the coal that we derive our heat from. Combustion produces fire, fire is heat and light; it is produced by combustion of inflammable substance. Fire produces heat because it liberates the light and heat from air and fuel. Combustion of fuel is coal packing by heat, and through capillary attractions hydrogen gases rise. Decomposition or burning is caused by the heat of the flame itself. The hydrogen gas of fuel is being set free, and excited by fire it unites the oxygen gas of the air, making a yellow flame. This flame heats the carbon of the fuel, which, when united with the oxygen, produces carbonic acid gas, causing combustion.

Three elements are necessary in combustion, namely, hydrogen gas, carbon and oxygen gas, the two former in the fuel and the latter in the air. Carbon is a solid substance known under the form of anthracite, charcoal, lampblack, coke, graphite and the diamond. Fire is red

hot after burning, sometimes because the whole surface of the fuel is thoroughly heated and every part of it is undergoing a rapid union with the oxygen of the air.

A blazing fire burns more quickly than a red-hot one. The reason for this is because inflammable gases of the fuel that escapes assists combustion. Carbon and oxygen united under heat form carbonated acid gas; hydrogen and oxygen form water, hydrogen and nitrogen form ammonia.

Smoke is unconsumed parts of fuel, mostly carbon, separated from a solid mass and carried up the stack by hot-air current. There is always more smoke when fresh coal is thrown on a fire, because more carbon is separated than can be reduced to combustion and the over-surplus goes up in black smoke. This shows that to fire light and often is far better to prevent smoke than to fire heavy. Often bright and dark spots are found in a clear fire. This is because the intensity of the combustion is greater in some parts than in others, caused by the air passing through the fire in unequal currents. It may be that clinkers cause the dark spots. They should be removed at the earliest possible time, as they retard combustion. Fire will not burn as well when the sun shines on it. The reason for this is the air is rarefied. This causes it to flow slowly to the fire and rob it of its nourishment. Fire burns better in cold weather than in hot weather, because the air condensed by the coal supplies more oxygen, which being heavier than the hot ascending air, it falls more rapidly into place and supplies the fire more rapidly with oxygen.

A large body of water will put out fire and a small spray of water will cause it to burn fiercely. The cause of this is, when water is thrown on fire in large quantities it forms a coating over the fuel, and prevents the oxygen from reaching it; water being converted into steam, it draws off the heat. Water being composed of hydrogen and oxygen and thrown on a hot fire in fine spray, the water in its simple elements decomposes and serves as fuel to the flame. Powdered sulphur will quench a fire sooner than water, because it converts

oxygen into sulphurous acid. This deprives the fire of oxygen and causes the fire to die. Sulphurous acid contains less oxygen than sulphuric acid, consequently, it is no food for fire.

Spontaneous combustion is produced without the application of flame. It often happens that cotton, flax, hemp, old rags, waste, etc., if packed tightly away will in time give off carbonic acid gas during its burning, and will soon burst into hot flames. Many mysterious fires are caused through this.

Care of Safety Valves.

T. J. LYONS, Chaffee, Mo.

The safety of the boiler itself and the lives of those concerned in its operation depends to a considerable extent on the proper working of the safety valve and steam gauge, consequently these should be known to be in working order; when found to be in bad order repairs should be properly made.

We will take for example an Ashton valve that is leaking: First, face off seat of valve and turn off top of bushing, so as to leave the valve seat not over $\frac{1}{8}$ inch in width. Then face wing valve and turn off knife edge or pop lip until it will permit a thin piece of paper to be slipped between it and the bushing. The depth of the pop chamber should be kept as nearly as possible at its original dimensions: $\frac{3}{8}$ inch for the 3-inch valve and $\frac{1}{4}$ inch for the $2\frac{1}{2}$ and $3\frac{1}{2}$ -inch valves. The relief holes in the top of the pop chamber modify the amount of the pop. More holes make less pop, or *vice versa*. The pop is dependent on the amount of pressure that is accumulated in the pop chamber, the main discharge passing under the lip. Pop safety valve springs must be of proper size to suit the pressure at

which the valve is to work. They can not be used for a greater range than fifteen pounds above or below the original set pressure without materially impairing the efficiency of the valve.

If the valve has a ringing noise, take out the wing valve and clean out the wings, then turn down until it is a nice fit in the bushing, but not striking at any point. This will prevent lateral motion, which causes the ringing noise.

In adjusting the safety valve it is very important to know that the steam gauge is correct and that it is getting a full supply of steam. A good method is to have a steam gauge that is known to be correct and with suitable connections; couple same to top water glass cock. Open bottom water glass cock first, in order to fill steam gauge with water, as true steam is injurious to the gauge; then open top water glass cock and note difference, if any, between the two gauges and set pops to required pressure, as shown by test gauge. If the steam gauge of the engine is incorrect, remove and place on testing device and adjust until it registers correctly.

A Knock Which Boosts.

An executive of the Frisco has received the following complaint from an employe regarding a section foreman. It is the best evidence of a knock being a boost that has been brought to the attention of The Frisco-Man for some time:

Mr. ———: I want to call your attention to your section foreman at this place. I want to tell you he is altogether too hard on his hands. He treats them just like they was convicts. Now, I am a Christian, and I don't want you to misunderstand me. I don't mean to say that this man cusses or talks rough to the hands, because he don't; but he works them too hard and he hangs with them like he thought they were going to escape, and he is always in a hurry and crowding them, and the hands say he had some way about him that makes them hurry, even if they don't want to, and some hands had to quit the road because they could not stand to work for him.

He done the same way awhile back when he had some teams to work on the road. He ain't got no pity on a team or a man. Just crowds all the time. I have heard that he was considered a hard man to work for on the other roads where he has been foreman.

Now, I don't know anything about the ways of railroads, but there is a man that lives here that has been a road boss, and he said the company did not want a boss to work his hands hard, and any man could stand it to work on the section if the foreman was the right kind of a man. This man's name is ——— and he says he knew this man ——— before he came here on other roads, and he had the name of never being satisfied, no matter how much work he got done in a day. He said he knew ——— when he was a head boss on the railroad, and he was hard

on everybody then. He said he had talked to a head boss that knew ——— up in Missouri, and he was the same up there as he is here. Now, I do not ask you to put this man off the road, but we do ask you to move him from ———. There are some men here that would work for the road if this man was gone, but they can not work for him because he is too hard and wants too much done. This man seems to think the world was made in one day.

Now, ——— said the company would make this man move to some other place on the road if they were asked to do so. This man has a family and we do not ask you to fire him. Just take him to some other place. Mr. ——— says even if he was fired it would not hurt him, as he could get a job on any road at Fort Worth. He was well known by the other roads, and all he was staying here for, anyhow, was because he has a little girl that is sickly, and he thinks she will get well at ——— by drinking the water that is in the company's well.

Now, Mr. ———, do not ask the big-bugs of ——— or the agent about ———, for they are stuck on him. I guess it is because he belongs to all the lodges that ever was, and they don't have to work for him.

If you need a foreman for this place you can get ———. He is not here now, but his wife is, and she would let him know and he would come right away.

From one who believes in justice,

FROM A FRIEND.

The Home of the Hamilton Watch.

This factory is located in Lancaster, Pennsylvania, and bears the distinction of being the most beautifully located, equipped with the very best and latest machinery, and operated by the finest skilled workmen in the world.

Lancaster City is the county seat of Lancaster County, which has a world-wide reputation, and the statistics in Washington show that it stands foremost in agricultural wealth in the United States. Many who have seen the world pronounce Lancaster the garden spot of the United States, and that part of Pennsylvania the most fertile and lined with the most beautiful streams and the most thoroughly cultivated section in the whole world. The population of the county is 160,000; of this 50,000 live in the city of Lancaster, where in 1874 the corner-stone was laid for what is now its most important industry, and bids well to be one of the largest industries in the watch line in this country before many years.

The factory now employs 700 skilled workmen, many of whom have put their whole life into the study of watch-making. The result is the Hamilton Watch, which is so extensively used on

the railroads of America, is the work of many years of hard study and untiring efforts, and has been to these people a labor of love since its inception.

One of the most interesting features of the factory is this: That all of the machinery used here is designed and made right in the factory, and a special set of experts are employed on this work. It might be a matter of interest to the kind reader to know that some of the automatic machines that are built here make as high as 11,000 screws a day out of wire, and when they are completed, with a point and a slot for the screw-driver, they are scarcely visible to the naked eye, and it requires more than 2,000 of them to weigh an ounce.

This company employs a set of experts, whose work it is to test every watch before it leaves the factory in the most scientific and exhaustive way, and pronounce it a perfectly accurate time-keeper before it is allowed to leave the factory.

The company has provided free lunch rooms, a library and rest rooms for its employes, and it has never had occasion to close its factory for want of orders.

B—203.2.

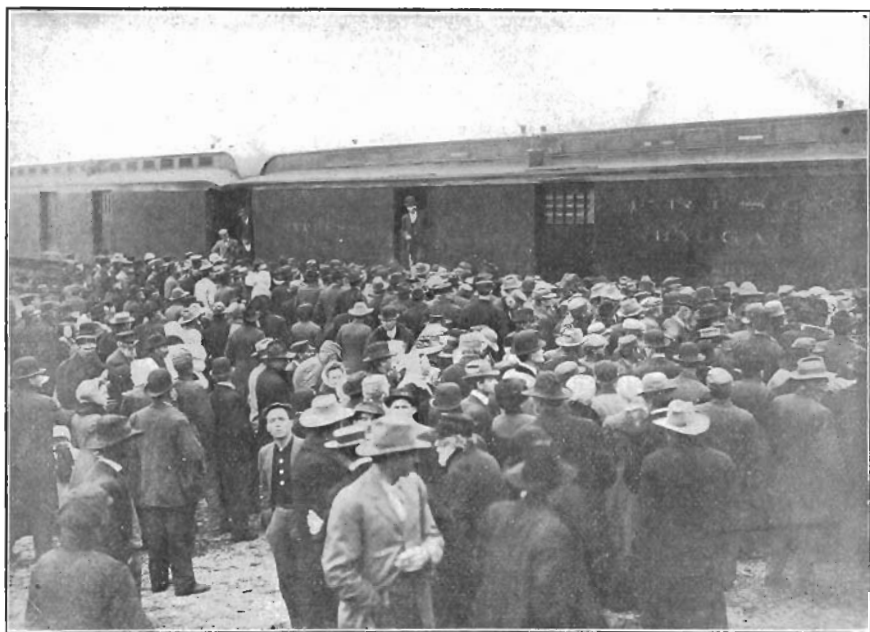


Guss Briesacher and crew are the men shown in the accompanying picture, which was taken at Bridge B-203.2, Hunter Branch.

This bridge consists of fifty-five bents,

and covers a part of the high water channel of Black River on the Hunter Branch, near Williamsville, Mo.

Mr. Briesacher, the foreman in charge, will be noticed standing to the left.



A special train, carrying members of the faculty of the College of Agriculture, University of Missouri, recently toured the lines of the Frisco in Missouri, for the purpose of giving free lectures to farmers at various points along the line upon better methods of agriculture.

The accompanying picture shows Professor C. H. Eckles addressing an overflow meeting from a car door at Aurora, Mo., February 25, and is an evidence of the interest which the farmers took in the train.

Station Agent Changes.

Freight agency is established at Diggins, Mo., J. M. Philpott appointed agent, effective March 31.

W. A. Ellett succeeds E. R. Haynes as permanent agent at Marshfield, Mo., effective March 30.

S. T. Meek succeeds W. A. Moore as permanent agent at Blue Springs, Miss., effective March 29.

W. T. Lee succeeds Layton Seymour as permanent agent at LePanto, Ark., effective March 29.

F. M. Frew succeeds W. A. Ellett as temporary agent at Newburg, Mo., effective March 29.

E. J. Abbott succeeds F. C. Lea as agent at Eureka, Mo., effective March 28.

T. J. Ballard succeeds G. E. Gravlee as permanent agent at Mineral Wells, Miss., effective March 28.

B. T. Richardson succeeds E. E. Dinger as permanent agent at Williford, Ark., effective March 27.

G. P. Blomeyer succeeds G. H. Turner as permanent agent at Zalma, Mo., effective March 23.

R. D. Sublett succeeds F. N. Bobbitt as temporary agent at Latham, Kan., effective March 23.