URGES ELECTRICITY AS COAL CONSERVER

National City Bank Says Fuel's Efficiency Is Thereby Doubled.

CITES CASE OF ST. PAUL

Railway Saves 11.3% of Total Power Used by Generating Current on Down Grades.

The National City Bank has recently, in its monthly bulletin, been paying much attention to the important subject of saving coal through the use of more efficient and economical power plants. Not long ago it presented a careful analysis of the coal consumption and average operating efficiency of the steam engines of the United States, showing that, on a conservative estimate, 15,000,000 tons of coal could be saved every year if every steam engine in the country were as efficient as the more modern and better-designed power plants.

In its current bulletin the subject is taken up again with reference to the electrification of the railways, which are naturally among the largest coal consumers. The locomotive has long been notorious as a wasteful power producer, although great strides forward have been made in its design and construction in recent years. The Superintendent of Motive Power of the Pennsylvania recently stated that within five years the coal efficiency of the locomotives of that great system had been practically doubled, at an increase of about 30 per cent. in capital cost.

One of the hugest and most successful experiments in increasing the fuel efficiency of railroad engines by electrification has been that of the Chicago, Milwaukee, & St. Paul, which in 1916 completely electrified its Rocky Mountain Division, and is now installing electric equipment on its Cascades Division. The City Bank bulletin publishes a statement by Vice President Goodnow of this railroad regarding the results of electrification on the Rocky Mountain Division, and in passing quotes the superintendent of the division as declaring that to handle the traffic in October, November, and December of 1916 without electricity, it would have been necessary to double-track the road.

One of the most remarkable features of electrification in the mountain roads is the manner in which the force of gravity is utilized, on the down grades, to generate power. This, of course, in reality only represents the redemption of power expended in hauling trains up to the top of the grades, returned by simply transforming the motors which haul the trains up, into dynamos on the way down. The weight of the train itself generates current which goes back into the line, and the amount of power thus saved, during the three months reviewed, was equal to 11.3 per cent. of the total power used. In the old days all this power, representing thousands of tons of coal, was used up solely in wearing out brakeshoes. Yet Mr. Goodnow considers this saving of power itself of less importance than the ease and safety which the system contributes to handling trains on the down grades, and the lessened wear and tear on equipment, because the dynamos, while generating power, act as powerful brakes.

"Although the figures," says Mr. Goodnow, "show up favorably for electrical operations, they can by no means be considered as final, inasmuch as the comparative figures for steam operation represent the results of many years of effort and experience, while the figures for electricity are based on the use of apparatus and a system which is entirely new in many respects, and at the time the figures were prepared, on an operating experience of less than a year."

The bank also presents a statement from the Norfolk & Western, which has been operating for over a year with electric power over twenty-nine miles of heavy grades upon its Pocahontas Division over the Alleghenies.

"The estimates of increased capacity to be obtained from this equipment have been fully met," this road found, "and an unusually heavy tonnage has already been handled without congestion. The movement of the heavy tonnage trains by electricity has been effected with ease and smoothness; and it has been found that the heavy trains can be smoothly controlled by one head engine on the 2.5 per cent. down grade by electric braking alone."

One-fourth of the coal mined is consumed by the railways, and the movement of this alone forms a very considerable part of the traffic demands upon them. The bank calls attention, however, to the fact that nearly 50,000,000 of unused horse power in the streams is locked up under Federal jurisdiction. "The running waters, which will flow forever, are closely guarded, in the name of conservation, while the coal supplies are depleted. But even where coal is used to generate electricity in large stationary units, one pound of coal will produce as much power as two pounds burned under a locomotive boiler."

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