



FRIDAY, MAY 9, 1902.

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Contributions

Superheated Steam in Locomotive Service.

Hanover, Germany, April 22, 1902.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In my letter of March 11, which you were kind enough to publish in your issue of April 11, a slight error relating to competition between the different types of engines, somehow crept in. The 10 de Glehn locomotives, to which I then referred, will not be provided with superheaters. The competition will be between 10 of my engines, 10 de Glehn, and some others built on the Schmidt-Garbe system, and these latter will use superheated steam.

I have not, up to the present time, succeeded in designing a satisfactory superheater-compound engine. The best stationary steam engine practice certainly points to the great efficiency which would result in compound locomotive operation by the use of superheated steam.

A. VON BORRIES.

The Virtues of the Enclosed Automatic Disk Signal.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Now that you have got some of the main questions concerning the New York tunnel disaster out of the way, I want to ask you to consider for a moment one point which you briefly touched upon in your editorial of Jan. 17, that is of quite general interest, but which seems not to have received the attention which it deserves. You say that the most approved standard type of signal for daylight use is the semaphore; and the fair inference from your words is that the semaphore is the only signal which is recommended by "the highest signaling authorities."

Now, who are the highest signaling authorities? And when did they decide that the semaphore was the only proper signal? Assuming that the said authorities have so decided, what is the scientific and practical evidence on which that decision is supported? I ask these questions because the disk signal is still an important factor in the railroad world. Indeed, it is a very live signal. On the Boston & Maine, near Boston, automatic disk signals are in use which were erected over 30 years ago. Two other prominent New England railroads use hundreds of disk signals, including the outdoor disk, actuated by clock work. Enclosed disk signals are used on the eight-track line of the Illinois Central in Chicago, where they did remarkable service at the time of the World's Fair; they are in use on more than half of the main line of the Lehigh Valley; and they are the standard automatic signal of the Philadelphia & Reading and the Chicago & North Western. This is by no means a complete list; but it embraces many hundred signals. And perhaps the most significant thing about it is that the two roads last named are extending the use of enclosed disk signals.

This is a most extensive showing. One good reason why this signal continues to find favor is, of course, the low cost, as compared with other designs, both for installation and maintenance. But are there not good and important reasons besides that of low cost?

I think there are; and I wish to briefly set this forth. The main questions concerning an automatic block signal may be placed under the three heads of (1) reliability; (2) visibility; (3) cost. In the main, the reliability of a disk is the same as a semaphore; the same batteries, rail circuits and electro-magnets are used to control in one as in the other. Considering now the enclosed disk, it is protected from rain, snow and wind. The electric semaphore is exposed to all of these, and it may be so loaded with snow or ice as to stand in the all-clear position when there is a train in the block section. This is not an imaginary danger, as anyone may learn by inquiring of signal engineers who use this style of signal.

Railroad officers who have adopted the electric semaphore, worked by a motor, say that they have obviated this difficulty by arranging the signal to stand normally in the danger position. Passing over the point that this is not a complete safeguard, it must be observed that the arrangement for keeping automatic signals normally in the danger position involves an increased complication of wires, batteries and relays. Every one will agree that increased complication is a decided disadvantage, and that simplicity is or should be a cardinal feature in automatic signals.

The main objection to the disk signal is that snow may stick to the glass and hide the signal. Nobody denies this. The question is whether it will really cause serious inconvenience. I am now considering it under the head of reliability; but surely, if the engineers follow the simplest rule of railroad operation, to stop their train when in doubt as to the meaning of a signal, there can be nothing worse than delay, so that it is a question not of reliability but of facility in operation of trains. With the usual force of trackmen, the snow can be wiped off from the faces of the signal cases as often as may be necessary. Certainly, there is less objection to entrusting this work to track laborers than there is to the employment of untrained men to knock the ice and snow off from semaphore blades. In the latter case, the man is in a position to interfere with a working part of the signal; with the enclosed disks, he cannot possibly interfere with the working parts.

Experience has shown that the trouble from snow is really insignificant. In the colder climates, this trouble may occur one day in a winter, or ten days; it is very irregular. An officer of the Chicago & North Western has said that the average number of snowy days on his road is not more than two days in each year; and this does not mean two whole days; it means that there were two days on which the glasses had to be wiped off.

Another objection is that light reflected from the sky as, for example, yellow light at sunset, will often make the surface of the glass appear yellow and thus interfere with the red indication of the signal. This objection is also readily admitted, but with equal confidence that nobody can show it to be a serious one. No fair-minded defender of the enclosed disk now claims that the color of the disk is of first importance. The essential nature of the indication is Light for all-clear, and Darkness for danger. In other words, a disk of gray, or yellow, or any other color affording a good contrast with the white (absence of color) which is used for the all-clear indication, would make a reliable signal. All the roads using the disk signals will tell you this.

This point is one that perhaps it is not necessary to elucidate, as it will be readily understood by anyone, whether versed in signaling or not. But in view of the objections which will be raised by those theorists who set great store on having stop signals uniformly red, and go-ahead signals uniformly of some one other color, it is worth while to here put on record this evidence, from the extensive experience now available, on many roads, that this alleged disturbance of the standard colors has not proved to be any real hindrance to the efficiency of the signals.

The claim that a disk signal is dangerous because the cloth of the disk will absorb moisture and thus put the signal out of balance, was formerly a matter of considerable moment, but this difficulty has been entirely removed. A signal which is normally adjusted will, if overweighed with moisture, remain in the stop position, and no harm is done. The trouble comes when a lazy inspector, to avoid the labor of strengthening a weak battery, changes the counterweight so as to overcome the abnormal weight of the cloth. This being done, the subsequent drying out of the moisture allows the signal to stand in the all-clear position, as the counterweight is on the all-clear side of the signal. The remedy is simply to so fix the counterweight that it cannot be increased beyond a safe limit. This done, the man must keep his batteries in good condition.

Visibility may be called a question of convenience. The questions of snow on the glass and of light reflected from the sky, are also mainly matters of convenience, as, with the most adverse conditions in this respect, trains can get along with nothing worse than some little delay. Visibility must be considered separately for night signals and for day signals. At night, when signals are most needed, the disk and the semaphore are all the same thing. Nobody disputes this, though the advocates of the semaphore seem to be very prone to forget to acknowledge it. In daylight, the semaphore has a great advantage in that it can be better seen—when? When you are a mile away from it. But why does anyone want to see a signal a mile away? You cannot see this distance unless the atmosphere is clear and the line is straight; but it is in weather which is not clear, and on lines which are not straight, that signals are needed. In short, the essential

thing about a signal is to see it clearly when you are a few hundred feet away from it; and for this purpose the enclosed disk signals everywhere in use are admitted to be satisfactory. Engineers have often made mistakes from seeing a signal too far away.

In this connection, I may add that the enclosed disks have an advantage over the semaphore in that they have in the black or white space around the disk, a uniform and distinct background. The semaphore often has a very unfavorable background; and the background of a given semaphore is often different at one season of the year from what it is at other seasons.

Our third head is cost. As already stated, the cost of the disk is much less than that of any other form of signal. As long as we depend on an electric current, from a battery, either primary or secondary, it is too obvious to be argued, that there will be economy of power in signals completely enclosed, as compared with outdoor signals. In the latter, we have to provide a large surplus of energy as an offset against a possible extra weight of snow to be moved.

If I have made myself clear, I have shown that the disk is equally reliable with the semaphore, and in some respects is more than equal; that the trouble from snow on the glass is not a serious matter, and that in design signals to be seen at a great distance we are wasting our energies. I have found no competent judge who pretends to deny these points, and therefore I claim that science and experience combine to sustain the superiority of the enclosed disk signal.

O. R. D.

The Air-Brake Convention.

The ninth annual convention of the Air-Brake Association was held in the Monongahela House, Pittsburgh, Pa., April 29, 30 and May 1. The attendance was the largest in the history of the Association, there being 176 present out of a total membership of 655. This was regarded as very gratifying, as it was feared that the restrictions on passes would interfere seriously with the attendance; however the situation of Pittsburgh is such that this did not affect the majority of the members. The large number present was probably due in some part to the opportunity to visit the works of the Westinghouse Air-Brake Co.

At its opening the convention was addressed by Mr. C. A. Robertson, representing the City Recorder of Pittsburgh. Mr. Otto Best, of the Nashville, Chattanooga & St. Louis, and the President of the Association, called it to order at 9 o'clock. Following are extracts from his address:

CURRENT CARE OF THE AIR-BRAKE.

The vast number of brakes applied within the past five years has resulted in a corresponding increase in brake repairs; the number of inspectors and repairmen being greatly augmented, and it has now become a recognized fact that the air-brake department of a railroad is one of great importance, second to none. Thousands of dollars are spent annually by railroad companies by reason of the improper supervision of the air-brake department in the purchase, application and repairs of brakes. A systematic organization can only be had by procuring the services of a first-class general air-brake inspector, who has full supervision over all matters pertaining to air-brakes, and is held responsible for the proper application, maintenance and operation of the brakes. The improper repairs which are constantly being made by inexperienced repairmen (I speak more particularly of triple valve repairs), demand the closest attention of the members of this Association. We should see to it, that so far as it is in our power, none but competent men be put in charge of this work.

At the last meeting of this Association at Chicago a committee was appointed to represent it at the Master Car Builders' Convention, to urge the necessity of increasing the price for cleaning triple valves and brake cylinders to an extent that would induce railroad companies to take a more active interest in the cleaning of freight brakes, and thus promote their efficiency. The committee met with hearty co-operation on the part of the M. C. B. Association, and its mission was accomplished, in that the price for cleaning triple valves was increased from 10 to 20 cts., and that for cleaning brake-cylinders from 15 to 20 cts.

I am sorry to say that railroad companies have not manifested the interest they should in the repairs to freight brakes. The practice of cleaning and oiling brake cylinders through the oil plug with car, engine, or cylinder oil is still being carried on. It is not only in direct violation of the M. C. B. rules, but very detrimental to the cylinder packing.

While the proper cleaning of triple valves is essential, the repairs and testing after repairs have been made, is of much greater importance. The practice of cleaning triple valves without removing them from the auxiliary reservoir is still being indulged in by some railroad companies. A large majority are not testing them at all. The M. C. B. rules require that triple valves be removed, cleaned, oiled and tested, and too much stress cannot be put upon the word "tested." The railroad with which I am connected has at all terminal points a device for testing triple valves; first for packing ring leakage, second for release, third for tightness of slide valve, emergency and check valve, etc. The oiling of triple valves with car, engine or lard oil has been discontinued by the company I represent, and a light grease substituted. This practice has given remarkable results in the reduc-