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«Rail» Question in North America: Continuation of the Topic


Желѣзнодорожное Дѣло

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ТОВАРИЩЕСТВО ЗАВОДА ПНЕВМАТИЧЕСКИХЪ МАШИНЪ

С.-ПЕТЕРБУРГЪ.

The material on this topic was published in our previous issue (see World of Transport and Transportation, Iss. 2, 2019). We continue this theme, as it was continued in 1909 by «Zheleznodorozhnoe delo» [Railway Business] Journal.

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As a result of the breakdowns of rails that have become more frequent in recent years and the misfortunes that have occurred as a result, American public opinion is very interested in the question of the measures that must be taken to reduce the number of such cases*. Quite a few articles and meetings of scientists and technical societies have already been devoted to this issue. The recent meeting of the American Society for Testing Materials, whose elected president Charles V. Dudley had already worked a lot on this issue, was devoted to this issue. Dudley, who himself delivered the report, first of all points to the following fact: over the past 25 years, the weight of rails has only doubled, and the conditions of service have become heavier to a much greater degree: the speed has increased quite significantly, the average axle load has increased for cars by 75 %, and for locomotives by 100 %; finally, the traffic on significant lines has more than tripled.

Besides, he points to the fact that the rails are often forced to serve on the railways under conditions that cannot be called favorable. Drawing attention to this phenomenon, Dudley argues that the cost of building better roadbed, of getting good ballast, of more frequent laying of sleepers, etc. are paid off quickly **.

Turning to the other side of the matter, Dudley says that the Bessemer metal, made in America lately, became worse than it had been 25 years ago. This is due to the fact that the pure ores needed for this process are now rarely found and are more expensive; but, apart from this reason, Dudley also points out the following: 1) steel is cast into too large blanks, that is why the size of segregation is larger; 2) during casting, little attention is paid to the fact if the reaction in the metal after addition of impurities was able to reach the end; blanks

* The authentic syntaxis was maintained as close to original as possible. – *Ed. note.*

** In our homeland, these instructions should also be kept in mind and executed as the quality of our rails is much worse than that of foreign ones. – *Original editorial note.*

are submitted for rolling immediately after casting; rolling ends at a too high temperature. At the same time, he notes the fact that the old forms of the profile with very small amounts of metal in the sole greatly damaged the cause.

Turning to the means for improvement, Dudley points out that the railways in America have already met the requirements of metallurgists regarding the profile and have developed types that completely satisfy their desires. For example, in type B the associations of metal distribution are already quite symmetrical, namely the head and the sole have 40 % thereof, and the neck has 20 %, etc.

Speaking about production of rails and asking the attention of metallurgists to the fight against steel blistering and segregation, Dudley, by the way, states the following. The question of the size of the piece, which must be cut from the upper part of the blanks to get quite healthy rails, is still controversial, as is the question of the size of segregation. These questions are complex, since you have to deal with a number of factors: steel temperature during casting (higher or lower); mold casting speed (fast or slow); speed of cooling of blanks; when to roll them: whether immediately after casting or not, etc.

As for the technical conditions for the rails, they usually do not give any prescriptions regarding the size of the segment, this is left to the discretion of the producer, and it is believed that the producer will try to keep the rails with the shrinkage shell out of business. Dudley also points out that under the old conditions the rules on testing were unsatisfactory: for example, the choice of a rail for testing was provided to the producer; 1 rail was tested per 5 heats, and if it turned out to be satisfactory, all the rails made during 5 heats were accepted; if not, 1 rail from each of the other 4 heats were tested.

The new technical conditions in this respect are better, since according to them the choice of a rail for testing is provided to the customer's receiver. The test is done by hitting with drop hammer, and the technical conditions usually indicate, besides the weight of the hammer's head and the weight of the chair, the height of the ascent of the drop hammer, and in some conditions the rail deflection is also specified. Dudley finds that this method of testing is well suited to the conditions of service of the rail but considers it necessary to caution against the requirement of excessively large heights when lifting the drop hammers.

Dudley's report does not cover the chemical composition of steel, but at the end of the report Dudley pointed out the success achieved in this matter thanks to the work of the Society for Testing Materials; he drew also the attention of metallurgists to the need to conduct the Bessemer process as thoroughly as possible, and also pointed out the importance of correct statistics of rail breakdowns, which is now conducted by American roads, for judging a rail service (*«La Metallurgie», Iss. 4, 1909*).

Translated by I. T-v (Zheleznodorozhnoe delo [Railway Business], 1909, No. 43, p. 241) ●