

first degree of retarding power was applied, it took a weight, so placed, of fifteen pounds to bring it gently round; the second degree, thirty-six pounds; the third degree, fifty-six pounds; and the fourth degree, three quarters of a hundred; but with this weight no one person was capable of moving either wheel on its axle. Mr. B. Pearson, organist of the city church, is the inventor.—*Oxford Paper*.

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*Effect of the velocity of air upon its use in smelting Iron.*

Mr. Teploff, one of the Russian mining corps, in an article on the improvements recently introduced into the smelting of iron in Russia, makes the following statement. In the smelting furnaces of the Ural, where the quantity and velocity of the blast are properly regulated, 1.4 of pig iron is obtained by 1 of charcoal fuel, while in other furnaces they obtain but .4 and .6 by the same consumption of fuel.

The velocity of the blast being increased, the heat within is increased, without a corresponding consumption of fuel. In an experiment made by order of the government, it was found that one hundred cubic feet of air, under a pressure of two inches of mercury, produced the same effect as two hundred cubic feet, under a pressure of one inch, with this difference, that in the latter case, twice the fuel was consumed which was required in the former case.

In one furnace which is mentioned, 22,000 lbs. of iron were obtained in twenty-four hours, by 16,000 lbs. of charcoal. Previous to the due regulation of the draught, they consumed twice this amount of fuel for the same yield of iron.

This economy is obtained by duly proportioning to each other the size of the blast-pipe, and the pressure of the draught. The relation of these to each other varies with the furnace.

M. Teploff asserts that the results thus obtained exceed those with the hot-air blast; but it does not appear that any comparisons have been made under his examination, and with the charcoal fuel.

To regulate the draught, it is recommended to place two mercury or water-gauges, one near the blast pipe, the other near the governor of the blowing-machine. By varying the pressure, and the diameter of the nozzle of the blast-pipe, making the latter smaller as the former is increased, and *vice versa*, the best proportion is to be ascertained.—*Annales des Mines*, vol. vii. G.

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*Receipt for fastening Leather upon Metal.*

A. M. Fuchs, of Bairere, says that in order to make leather adhere closely to metal, he uses the following method:—The leather is steeped in an infusion of gall nuts; a layer of hot glue is spread upon the metal, and the leather forcibly applied to it on the fleshy side. It must be suffered to dry under the same pressure. By these means the adhesion of the leather will resist moisture, and may be torn sooner than be separated from the metal.

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Athenæum.

*Novel Experiments on Railways.*

Since the opening of the Durham and Sunderland Railway, a novel experiment has been tried upon the line, which proves the practicability of railroad vehicles being propelled by wind. A temporary mast and sail were