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SCREENING OF SOFT COAL.

By J. S. McLENNAN, A. CAN. SOC. C.E.

(To be read 31st July, or 14th Feby.)

Coal comes from the pit to the surface as the miner has broken it down. He loads into the tubs the lumps and fine coal made by his pick in boling or undermining his shot, or in breaking up the large mass which is tumbled over as its result. In mines where a layer of stone adheres to the top of the seam, he is bound under a penalty to clear this off. But with other foreign matters found in the coal he has no concern. Roughly speaking, few seams are absolutely free from such impurities, and to bring the coal to its best merchantable condition, these must be removed as far as possible. When this has been done the coal is "run of mine" in the commercial sense. Round coal is that which passes over a screen, the bars of which have between them apertures of $\frac{1}{2}$ to $\frac{3}{4}$ of an inch. Slack is the coal which falls through these apertures, and it is often passed through a secondary screen and divided into nut and duff.

The desiderata in screening are therefore:—

I. Effective separation of sizes; so that slack may not be carried among the lumps into the round coal, or so that, in avoiding this by wide openings between the bars, too large coal may not pass into the slack, a consideration of some importance in shipping slack to the United States, where an excessive size would render the cargo liable to a higher rate of duty.

II. An opportunity for the removal of mechanical impurities as stone or pyrites, which occur in some mines as "balls," or elsewhere in laminations so thickly grouped, as to be easily visible.

III. The minimum of breakage in the transit, from the pit tub to the railway car, the vertical distance between the levels of which is from 15 to 25 feet.

The ordinary method of screening is by a fixed screen about 20 feet long and 6 feet wide, inclined at an angle of about 25° . The effective screening surface is reduced in many cases, by the use of cast iron bars about $\frac{3}{4}$ inch thick. The tub is commonly provided with an end door, and, when run on a tumbling cage, it is tipped into contact with the upper end of the screen. The door is opened automatically or by the attendant, and the coal slides down the screen. As there is no means of regulating its speed, it very imperfectly fulfils all the conditions of screening coal, except rapidity, as it is obvious that coal can be sent down it as rapidly as tubs can be tipped; but it is not separated effectively, no opportunity for picking is given, and the breakage of the lump coal and also of railway cars is excessive.

The method of screening adopted by Mr. Poole, at the Acadia Colliery in Pictou county, is effective and economical. He describes it as follows:—

Coal is drawn from the mine up an incline of 24° to 28° in boxes holding a ton each. The boxes have end doors, and are run forward on the bank head, 28 feet above the main railway, to a rocker. The loaded box tilts up, the door is released, and the coal slides out on to a dead plate at the head of the screens.

The dead plate, 3 ft. wide, dips at an angle of 10° . From its lower edge proceed two sets of bars which we may call A and B. A is 5 ft. long and is made of 2 in. bars placed 6 in. apart. It inclines at an angle of 21° . To its distal end is hinged an apron 12 ft. long, ordinarily lying at the same inclination. The free end of the apron is sustained by a counter weight. When the weight is down and the apron up, the passage over its upper surface is closed by a fixed stop suspended from above, at a point two thirds of the distance from the proximal end.