

The original rolls (the frame being of cast iron) were designed with one roll stationary and the other adjustable, the adjustable roll being held within a half-inch of the other by means of a counter weight acting through a toggle joint applied to each bearing of the moveable roll, it being necessary to have one adjustable on account of foreign material, such as bolts, spikes, etc., finding their way into them with the coal.

While the toggle joints gave very good results for small pieces of iron and rock, they would not allow the rolls to open up quickly enough to pass a two-inch machine pick, and this caused frequent breakages of the roll frame. To overcome this trouble the cast iron frame was discarded and the original rolls, bearings, and toggle joints were mounted in a frame consisting of two steel channel irons on each side, with a top and bottom cover plate, forming a box girder; to this girder is fastened, on each end, cast steel pedestals to receive the bearings, these last being held to the girder by means of four  $\frac{3}{4}$ -inch machine bolts. The effect of this construction is that when a machine pick passes through the rolls, and the toggle joint does not act quickly enough, the four  $\frac{3}{4}$ -inch bolts, holding the pedestals to the girder frame, are sheared off, allowing the rolls to separate and causing no other damage than the loss of the four bolts, which are easily replaced, and the machine put in running order again.

The product is elevated by No. 2 elevator and deposited on a shaking screen with  $\frac{1}{2}$ -inch perforations. The screenings fall directly to No. 3 elevator pit; all portions larger than  $\frac{1}{2}$ -inch going over the screen into plain rolls, 16 inches in diameter, and running at 80 revolutions per minute, and thence to No. 3 elevator pit. From here all the coal of  $\frac{1}{2}$ -inch diameter and under is elevated by No. 3 elevator to the raw coal storage tank, which is built of steel, brick lined. This storage tank is self-trimming, and holds 1000 tons, a feature which permits a supply of crushed coal to be kept one day ahead. Thus the washer proper is enabled to run on a day when the collieries are idle. The bottom of the tank is designed with two rows of parallel openings, fitted with sliding covers, each in line with a horizontal scraper conveyor delivering the crushed coal to the foot of No. 4 elevator, which delivers it in turn upon the shaking screen. This last has  $\frac{3}{8}$ -inch perforations, and being set at an angle of about 15 degrees, is supported upon rocker arms, and has an eccentric motion closely resembling that of hand screening. Owing, however, to the fine coal being more or less damp, it is impossible to separate the two sizes on a dry screen, so that, as the coal is delivered to the screen, it is met with a number of jets of water, which flush the coal