

until a much later date because the coal in the upper region was much cleaner and drier than that produced in the middle and the lower fields, and the operators did not look with favor upon the wetting of their coal. In the lower region, conditions were entirely different. The coal came from the working places wet and so completely covered with fine mud that it was almost impossible to tell which was coal and which slate until the fine material and mud were washed off. It was therefore thought better, if possible, to separate the slate when the coal was being washed clean.

From 1872 until some time in the 80's no important inventions were made in the preparation of anthracite, but the existing types of machinery were improved and better results were obtained. In 1884, the Pennsylvania Coal Co. built the Old Forge breaker, which was one of the best equipped at that time; Fig. 10 shows the breaker as it was designed. In this breaker, the coal without separation was passed through the rolls, going thence to two sets of revolving screens, where it is presumed that lump, steamboat, and broken coals were separated, the fine material passing through to the pentagon screens below, which had the same diameter as the first set and were 10 ft. long. This breaker is the first in which the writer has found that the pentagon screen was used although it may have been used before this period. This type of screen did not prove satisfactory as it entailed too much breakage; however, there is one set of these screens still operating in a breaker in this region.

The Pennsylvania Coal Co.'s old No. 8 breaker at Dunmore, Fig. 11, built in 1889, embodies some new features. The coal was brought over a trestle, in mine cars, to the top of the structure and dumped directly on to a set of bar screens, which separated two sizes from the rest of the coal, presumably the lump and steamboat. The finer coals fell through the bars to a set of revolving screens below. Unfortunately, what sizes were prepared is indeterminate, but nevertheless some of the coal was taken in an elevator to the top and front of the breaker and there prepared.

The lump and the steamboat coals were passed over picking chutes where the rock was removed and run to the rock chute. The lump coal went either to the lump pocket or to the main rolls and was crushed, thence passed to revolving screens for further sizing. The coal from the screens was passed through chutes, where the slate was removed by boys. The steamboat coal seems to have gone to a set of pony rolls to be recrushed, as no pocket seems to have been provided for it. From the pony rolls, the coal went to a revolving screen and was sized. At this breaker the following sizes were made in 1889: Lump, broken, egg, stove, chestnut, pea, buckwheat, and bird's-eye. It is probable that the bird's-eye coal was the same as present-day rice, or No. 2 buckwheat. All coal finer than the bird's-eye went to the bank.

In No. 8 breaker, the effect that had been obtained by raking the coal in the mine was produced on the surface by the use of machinery. The fine sizes that needed no crushing were removed from the coal as soon as it was dumped, the large sizes alone being sent to the rolls for crushing. In this breaker, all the revolving screens were driven by gears, the rolls only being driven by belting. Here also the pentagon screen was employed. No provision was made to store coal at the head of the breaker so as to provide for a regular feed to the screen bars or other devices. The coal came at such irregular intervals as to interfere greatly with its preparation.

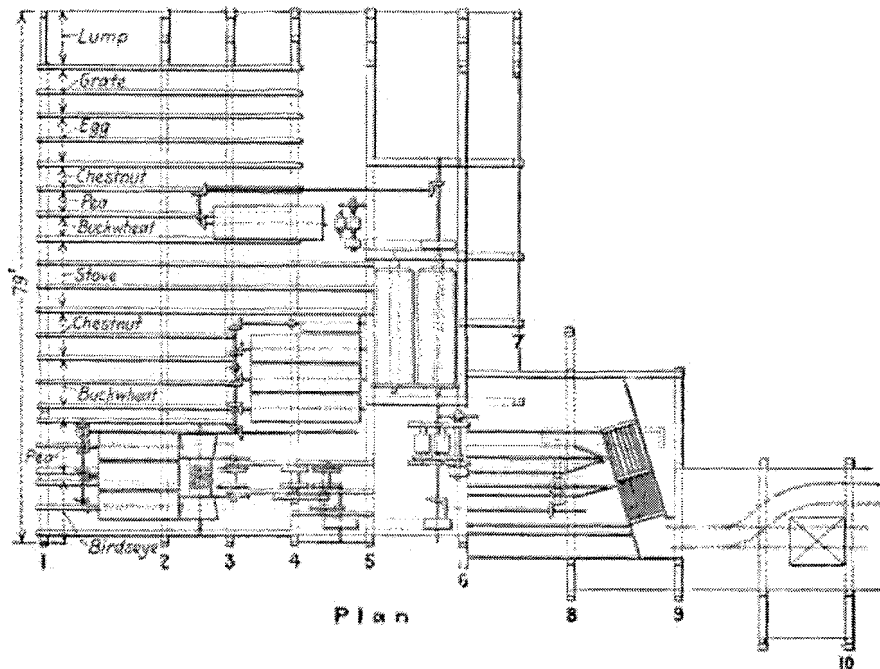


FIG. 11a.—OLD NO. 8 BREAKER OF PENNSYLVANIA COAL CO. AT DUNMORE, PA., IN WHICH THE COAL WAS SIZED BEFORE IT WAS SENT TO THE ROLLS.

Although this breaker was built when shaker screens were making their appearance they were not used, showing that they were not then considered sufficiently perfect to warrant their installation.

Just previous to the introduction of the shaker screen, Eckley B. Coxe, of Coxe Brothers, Inc., of Hazleton, invented the gyratory screen which this firm used for a number of years. These screens were satisfactory as to sizing and capacity, but their maintenance cost was high an account of the unbalanced vibration.

The Anthony shaker screen was among the first built, but this was preceded by a shaker that was supported on rollers and operated at an extremely high speed. The Anthony shaker was hung by wrought-iron rods. The suspension members were fastened to the shaker by a pin

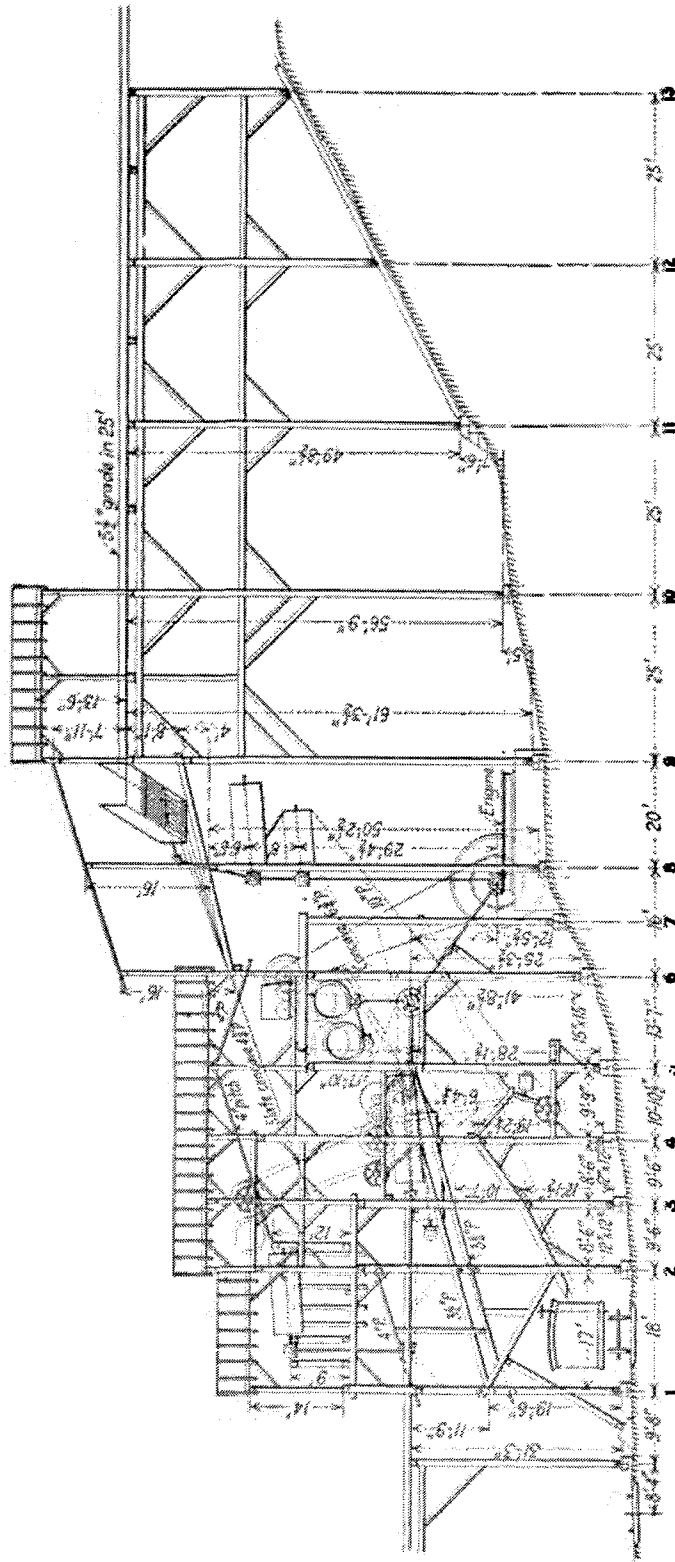


FIG. 11b.—Old No. 8 Breaker of Pennsylvania Coal Co. at Dunmore, Pa., in which the coal was sized before it was sent to the rolls.