

cause, as I have said, the coal supply was regarded as inexhaustible.

One of the things that aroused the owners of the mines to the realization of what they were throwing away, was the burning of the culm heaps by fires started by the workmen, on the heaps themselves, for warmth in cold weather. These fires gradually spread until they had permeated the whole mass and often burned for months at a time. This fact made it plainly evident that the culm heaps contained much good coal, and stimulated by the growing knowledge that the coal supply was decidedly limited, instead of inexhaustible, led to the inspection of the culm heaps for the purpose of finding out how much marketable material they contained. A careful estimate showed that from forty to seventy per cent. of the heaps was marketable material.

Having thus realized the value of the culm banks, the next question was how best to make use of the coal in such a finely divided condition. Three ways of using it have thus far been employed; (1) Burning it in its ordinary state; (2) Reducing it to an impalpable powder and burning; (3) Mixing the fine coal with some binding material and compressing the mixture into briquettes or eggettes. More than fifty patents have been issued for the appliances for the first method, thirty for the second method, and over one hundred for the third.

To carry out the first method of using the waste coal, a special character of furnace is necessary. There are three specific kinds of this furnace,—those with fixed grates, those with oscillating grates, and those with traveling grates. A draft is obtained by a steam jet or fan. The first type of furnace is of less value than the other two. The second, with the oscillating grate, has an advantage over the first and third, in that its rotary motion keeps the fine coal from falling through to the pit, and that the ash formed at the bottom of the fire is cut off and dropped into the pit, and also that the motion of the bars break up the clinkers and