R. HARTLEY.

Apparatus for Assorting and Washing Coal.

No. 211,846. Patented Feb. 4, 1879.

Fig. 1.

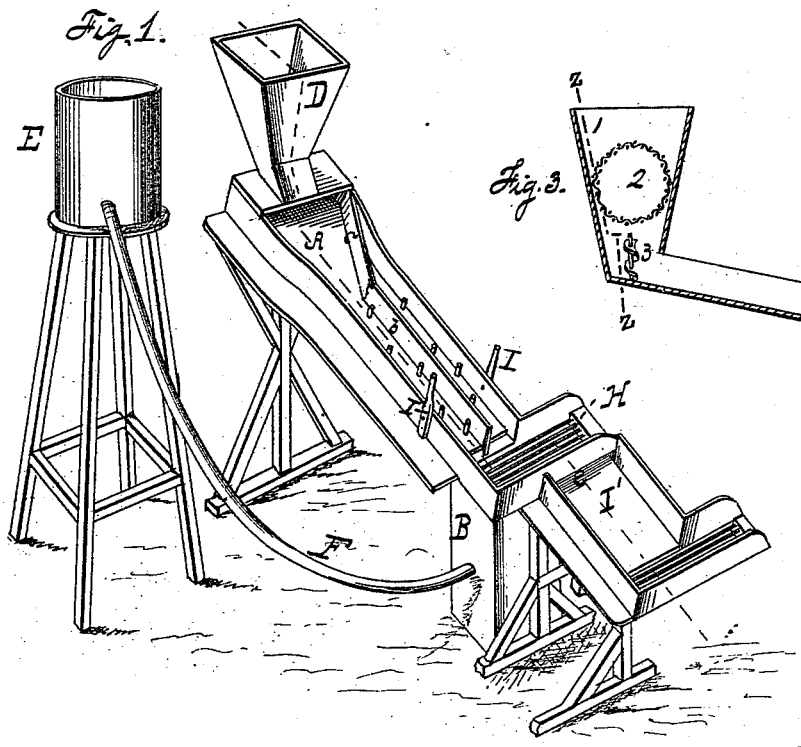

Fig. 3.

Fig. 2.

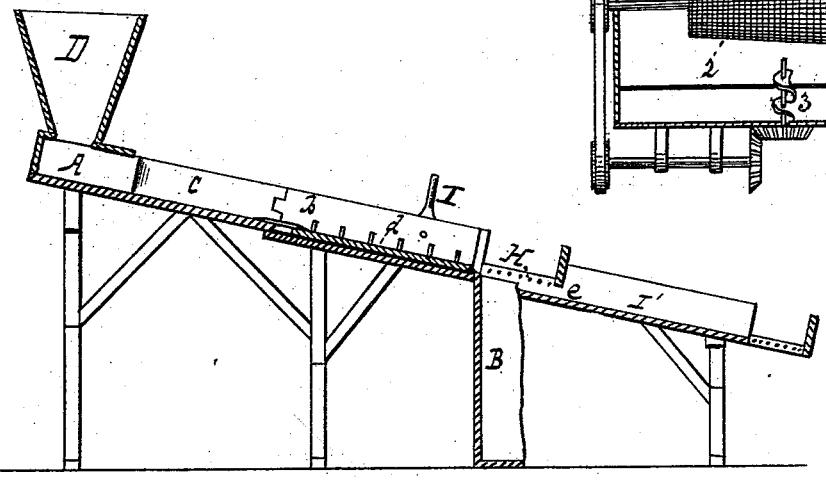

Fig. 4.

WITNESSES

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ROGER HARTLEY, OF UNION TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA, ASSIGNOR TO JAMES MULLENS, OF WOOSTER, OHIO, AND A. W. BOYD, OF ALLEGHENY CITY, PENNSYLVANIA.

IMPROVEMENT IN APPARATUS FOR ASSORTING AND WASHING COAL.

Specification forming part of Letters Patent No. **211,846**, dated February 4, 1879; application filed December 12, 1878.

To all whom it may concern:

Be it known that I, ROGER HARTLEY, of Union township, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in an Apparatus for Washing and Assorting Coal; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification, in which—

Figure 1 is a perspective view of my invention. Fig. 2 is a longitudinal vertical section; Fig. 3, a modification of the same; and Fig. 4 is a view of the same, taken through the line *z z* of Fig. 3.

It is known that after the furnace and household fire-coal are screened, the remaining material or refuse, which is called "slack," contains a large amount of small coal, commonly called "nut" and "pea" coal.

The object of my invention is to separate this nut and pea coal, sometimes called "slack," from the coal-dust and other refuse matter at the mine, and classify the same; and this I accomplish through the instrumentality of an apparatus, substantially such as hereinafter described, by which the coal can be perfectly separated from its refuse, and classified regularly according to size.

In the annexed drawings, forming a part of this specification, I have shown two sluices or flumes in communication with one another, and supported upon suitable frame-work. The main or upper sluice, A, is provided with a central longitudinal partition, *b*, dividing the sluice into two passages or branches, which lead into a pen-stock or box, B. The upper end of this sluice is provided with a switch, *c*, to the upper end of the division-wall *b*, so that communication can be cut off from either passage, and the material, from a hopper above, directed to either passage, as desired. Near the lower end of this sluice are a series of spikes or pins suitably fastened to sliding plates *d*, and as the slack screenings are automatically fed by gravity they are stirred or agitated at this point by means of the sliding device worked by the levers I, pivoted to the side of the flume. Above the upper end of the main sluice, and in rear of the switch, is mounted a hopper, D, for feeding the slack screenings to the sluices below.

E is an elevated tank or reservoir for containing water, and provided with a hose or coupling-pipe, F, forming a connection with the pen-stock to supply the same with water. The water is pumped to the tank by a suitable pump, and should be kept full, or nearly so, to maintain a pressure in the sluices. At the lower end of the divided sluice A, and immediately over the pen-stock or box B, is arranged a screen, H, with an extension overlapping the next section of the sluice I′, substantially as shown. This sluice I′ communicates with the upper one by means of the opening *e*, which allows the dust and finer coal that have fallen through the screen to pass downward to a screen located at the lower end of the sluice, which causes a second separation.

In operation the pen-stock or box will be filled with water from the tank, and the material directed into one of the passages by closing the entrance to the opposite one in passing down the inclined flume or sluice. The fine dust, slate, sulphur, and other foreign substance will fall through the screen into the box. The nut coal, being much lighter than the foreign substances, and larger than the openings in the screen, will collect on the surface, while the finer coal and worthless material that did not pass into the pen-stock or box will pass off to the next section of the sluice, where substantially the same operation is repeated, only on a finer scale, and so on to the last section, which receives all the coal of ultimate fineness. The washed coal, as it accumulates, is drawn off the screens into boats or railroad-cars ready for the market.

When the material has accumulated in the passage so as to obstruct a free passage or flow of the material in the flume, I shift the switch, so as to cut off communication with

that passage and open the opposite passage. While the same process of feed is going on in the opposite branch or passage the accumulated waste material is being cleaned or removed from the other. This process of feeding is thus kept up by alternating the direction of the material from one branch to the other. When the pen-stock or box is full of slate and other foreign matter, it is delivered at the bottom through a valve, (not shown,) which can be quickly opened and closed.

In some cases (see Figs. 3 and 4, which represent a modification of the invention) I propose to arrange a revolving coal-screen, 2, in the bin or hopper 1, to separate what coarse or large coal might be in the material, and immediately under this screen is arranged an automatic spiral feeder, 3, worked by the same power that drives the revolving screen, to feed the material regularly to the flumes below. The revolving screen and spiral feeder may be operated by meshed gearing or by other mechanical means, substantially as shown in Fig. 4, for giving the desired motions. Also, above the stationary screen 4 is mounted a common iron rake, 5, to keep the coal and slate stirred up, so that it will not clog the screen.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The apparatus for separating nut and pea coal from a material called "slack," which collects in large quantities at the coal-mines, consisting, essentially, of two or more inclined sluices or flumes communicating with each other, with an intermediate screen-box and a water-supply acting upon the material in the screen-box and in the lower flume, substantially in the manner as described.

2. In an apparatus for separating nut and pea coal from a material called "slack," the divided flume A, provided at its upper end with a switch and at its lower end with a screen, H, and a pen-stock, B, with its water-connection, in combination with a hopper, substantially as and for the purposes set forth.

3. The apparatus, substantially as described, consisting of a receiving-hopper, D, a divided flume, A, screen H, a pen-stock, B, with its water-connection, and flume I′, substantially as and for the purpose set forth.

4. The combination, with a sluice, of a sliding plate arranged therein at the lower end, and having a series of pins operated by means of a lever, for the purpose stated.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ROGER HARTLEY.

Witnesses:

LOUIS AURIN,

ALEXANDER W. BOYD.