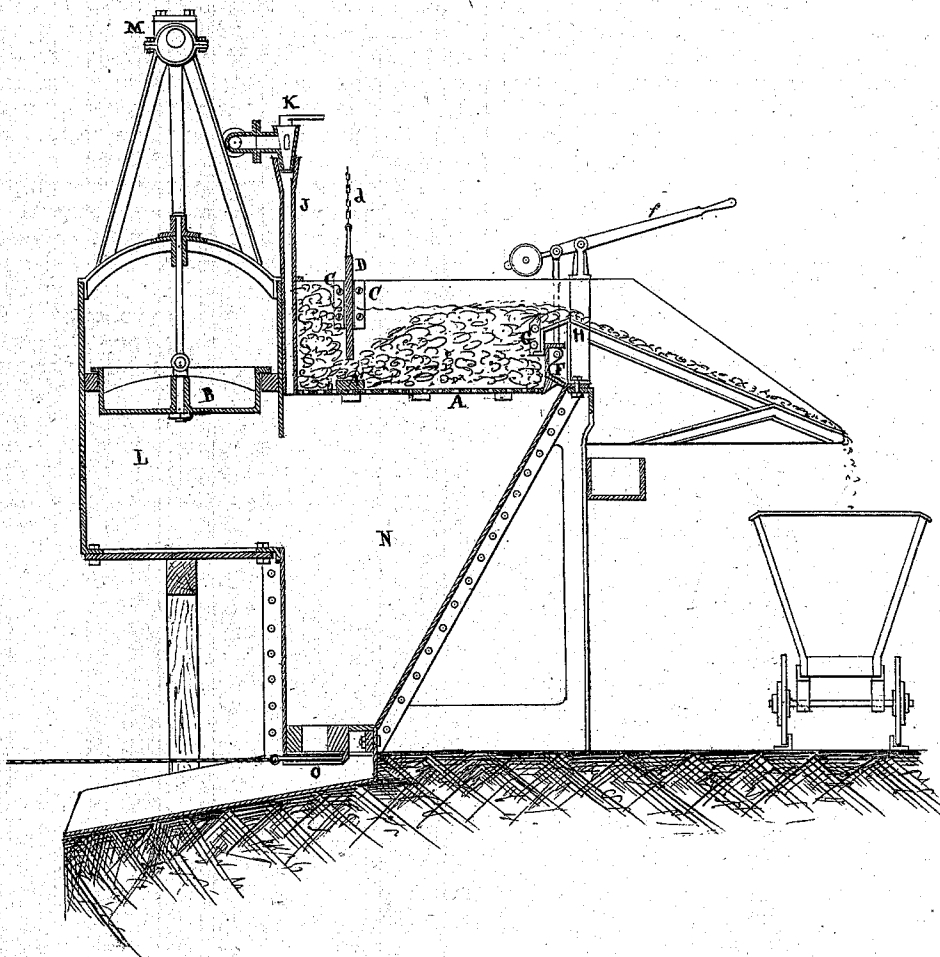


GEORGE LAUDER.

Improvement in Machines for Washing Coal.

No. 115,486.

Patented May 30, 1871.



Witnesses:

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UNITED STATES PATENT OFFICE.

GEORGE LANDER, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR WASHING COAL.

Specification forming part of Letters Patent No. 115,486, dated May 30, 1871.

To all whom it may concern:

Be it known that I, GEORGE LANDER, engineer, formerly of Glasgow, Scotland, now residing in New York city, in the State of New York, have invented certain new and useful Improvements in Coal-Washing Machines.

The main portion of my machine is similar to such as have been before known and have been long and successfully used in England, the object being to separate the pyrites and other foreign matter from coal in the large way, and to effect the operation with a due regard to economy. It requires a liberal quantity of water and a moderate expenditure of power.

The mechanism may be briefly described as composed of a large tank with a perforated platform forming a false bottom, and a large piston making short strokes in a cylinder communicating with the space below, and causing an intermittent lifting of the coal on the platform. The foreign matters, being mostly heavier than the coal, sink to the bottom, and the coal, being constantly supplied at one side of the perforated platform, moves slowly across under the lifting motion, and, on arriving at the other side, the coal flows over with a stream of water at the top and is received in a suitable car, while the denser foreign matter accumulates at the bottom and is discharged, either constantly or at intervals, through a suitable aperture at that point. The dust and other fine matter are washed out through the perforated bottom and gather in the bottom of the tank below. The total loss of weight by the washing process, with English coal, is between ten and twenty per cent.

The object of my invention is to increase the efficiency and rapidity of the separation of the materials. I provide means for introducing the coal on the receiving side of the platform at a line close to the perforated flooring. Starting thus from a uniformly low level, the coal rises without the dense matter, while, as heretofore managed, the mixed material was liable to be introduced promiscuously at the bottom or top, and, while that introduced at the bottom would frequently be treated longer than was necessary, that introduced at the top would pass over as coal while containing much unseparated metallic and earthy matter.

The accompanying drawing forms a part of this specification, and is a cross-section through the apparatus. It shows the novel parts, with so much of the other parts as is necessary to understand their relations thereto.

I wish it to be understood that my improvements are equally applicable to washing-machines which act by continuous flow of water instead of the intermittent action above described.

Referring to the drawing, A is the perforated flooring, and B is the piston working in a cylinder, L, which communicates with the lower portion N of the tank or bash. The piston B is driven up and down by an eccentric on the revolving shaft M, which is turned by a steam-engine or other suitable power. The coal is introduced at the left side, and works across to flow over the ledge G-H on the right-hand side, while the pyrites, slate, and other foreign matter are discharged through the valve F, which is raised at intervals by means of the lever f. As this is arranged, the foreign matter discharged through the valve F mingles with the matter which is sifted through the perforations, and both are withdrawn together, at intervals, through the valve O, when the bash is emptied and cleaned. Water is supplied through the pipe J, under control of the cock K. I provide a solid plate or dead-floor, A', along a sufficient breadth on the perforated flooring, and mount over it an adjustable partition, D, which is supported by guides C-C fixed on the inner faces of the bash or tank. This adjustable partition D is raised or lowered by means of the chain d or other suitable means so that the rate at which the coal may be moved forward under it may be regulated at pleasure. This gate may be formed of one solid plate, or it may be made like a gridiron. In the latter case the separation of the impurities is facilitated by preventing the slack adhering in masses. The dead-floor A' may be formed by having the part of the perforated bottom it would cover solid, or only slightly perforated, so as to be dead in comparison with the other more liberally-perforated parts. I prefer to have it entirely solid.

It will be understood that, in practice, there may be many cylinders L and pistons B, mounted side by side, and worked by eccentrics on a single shaft, M; also, that there may

be many pipes J and cocks K receiving water from a single main; and that there may be many valves F controlled by rods and levers from a single rocking-shaft, turned by hand or by power; that the inclined plane down which the coal is finally discharged may be perforated and adapted to discharge all the water and to screen out most of the small sizes of the coal; that a cross-trough to receive the screenings and water and other accessories may be employed, and that the form and proportions of the apparatus may be varied in many ways without sacrificing the advantages due to the novel features in the invention.

I propose to make the movable partition D and the dead-flooring A' of cast-iron. I esteem it important that there shall be a portion of the perforated floor on the left of the dead-flooring A', in order to enliven and facilitate the movement of the coal through the comparatively narrow space under the partition D. A good proportion for each bash is five feet three inches long, three feet three and a half inches wide, and of any height of sides which may be preferred. The perforated portion, which I have called a platform or flooring, may be of copper plate one-sixteenth of an inch thick, perforated with holes one-sixteenth of an inch in diameter and one-eighth of an inch from center to center. This may rest upon cast-iron bars analogous to furnace-grate bars to give the proper support to the thin copper. The piston B for such a bash may be

three feet in diameter and with a stroke of two and one-half inches, making one hundred strokes per minute.

It will be found convenient in practice to work from three to six such bashes, with their operating pistons, side by side, and, by distributing the times of the descent of the pistons, the resistance on the operating-shafts M may be made approximately uniform.

I claim as my invention—

1. The adjustable gate D, combined with and arranged to serve, as represented, relatively to the perforated flooring A, tank or bash N, and means B L for inducing an alternate up-and-down motion of the water through the openings in the flooring A, so that the coal and the foreign matter, while it may be tumbled promiscuously in any convenient quantities on the receiving sides of the partition D, will be introduced to the separating side thereof at the desired rate and at a uniform level, as herein specified.

2. The dead-flooring A', in combination with the gate D and with the perforated flooring A, bash N, and means for inducing an alternate up-and-down motion of the water through the perforated portion of the flooring, as specified.

In testimony whereof I have hereunto set my name in presence of two subscribing witnesses.

Witnesses: GEO. LANDER.

THOMAS C. STETSON,

C. C. LIVINGS.