(No Model.)

A. SOTTIAUX.

PNEUMATIC COAL CLEANER.

No. 293,103. Patented Feb. 5, 1884.

Fig. 1.

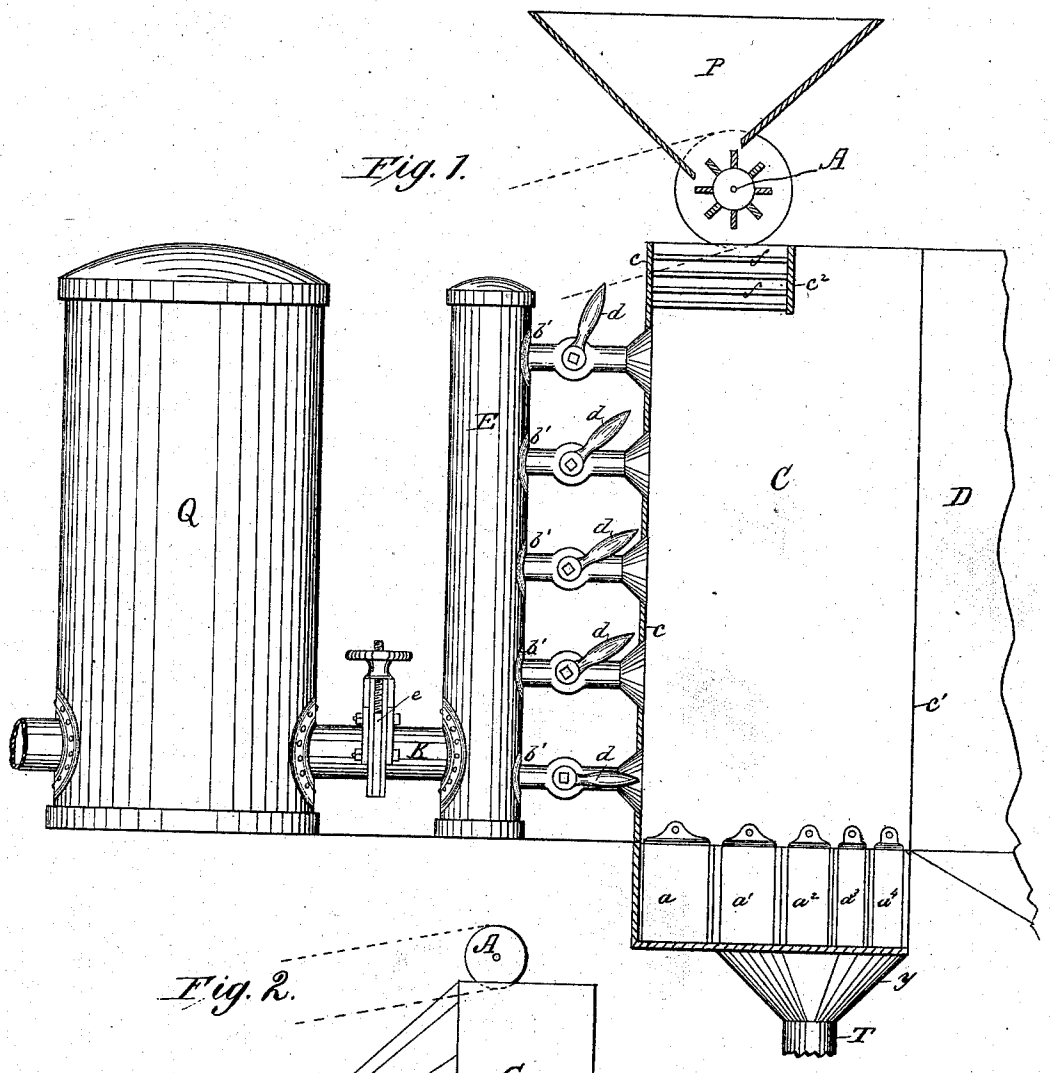
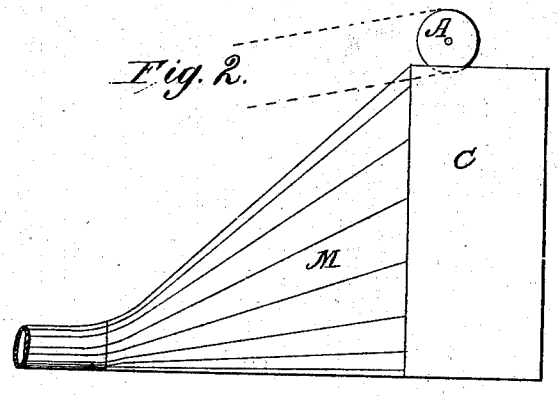


Fig. 2.



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PNEUMATIC COAL-CLEANER.

SPECIFICATION forming part of Letters Patent No. 293,103, dated February 5, 1884.

Application filed October 6, 1883. (No model.) Patented in Belgium March 16, 1883, No. 60,782, and June 26, 1883, No. 61,841.

To all whom it may concern:

Be it known that I, AMOUR SOTTIAUX, of the city of Strepy-Bracquegnies, Belgium, have invented certain new and useful Improvements in Pneumatic Coal-Cleaners, of which the following is a full, clear, and exact description.

My improved apparatus differs from the apparatus of this class heretofore in use in being capable of separating coal from the stones, schists or slates, and other substances with which it may be mixed and classifying it in heaps or compartments containing coals of proportionate size by means of exclusively pneumatic arrangements, as hereinafter described, whereby the use of water is entirely dispensed with.

The improved apparatus is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation, part in section, of my invention. Fig. 2 represents a modified form of tuyere or nozzle for graduating the blast or current of air.

The case C, Fig. 1, of square or rectangular form, and located at any convenient part of the works, is sufficiently elevated to enable the materials introduced at its upper part to acquire a certain velocity in their fall. The bottom of the case is divided into compartments a a' a^2 a^3 a^4, of dimensions proportioned to the materials to be received, by means of partitions suitably arranged. At the top of the case three rows of bars, f, the spaces in one row alternating with the bars of the next row, are let in between the partition c and an auxiliary partial partition, c^2, being perpendicular to these partitions. Immediately above these bars a distributing-cylinder, A, consisting of a roller of wood or other suitable material, over which are arranged radially a certain number of sheet-iron blades, turns in suitable bearings. Above this distributing-cylinder is a hopper, B, through which the material is introduced, and the said cylinder receives its rotary motion by means of a belt working over a pulley of suitable diameter placed upon its axis. The case C is open throughout its entire height and width on the side facing the wall c, where it is connected to a much larger case, D, having a hopper-shaped bottom and serving to collect the dust. A certain number of tuyeres or nozzles, b', (five in the example illustrated,) open into the case C through the wall c, being provided with valves controlled by handles or levers d. At the other extremity these nozzles communicate with an air-distribution column, E, arranged vertically and in communication with an air-chamber, Q, through the connecting-pipe K, provided in the middle with a valve or plug, e. The chamber Q is supplied either by powerful fans or by other blowing-engines.

This pneumatic or air-current apparatus works as follows: The coal is fed in through the hopper B, whence it is received upon the distributing-cylinder A, which delivers it upon the bars f f. These bars separate it in such a manner that the fragments of schistose or slaty matter, (which are generally of a flat shape,) in falling through the case C, do not present themselves flatwise, but edgewise, before the openings of the nozzles b'. The latter open in the following order: the first from the bottom entirely, the second four-fifths, the third three-fifths, the fourth two-fifths, and the fifth one-fifth, whence it results that the power of the air forced in at the nozzles against the falling bodies increases proportionately from the upper to the lower part. The lighter particles—such as the valuable coal-dust, &c.—are blown directly into the large case D by the upper openings. The somewhat more consistent portions offering more resistance to the air, owing to their weight and acquired velocity, fall into the compartment a^4, situated closer to the nozzles, and in suitable gradations in a^3, a^2, and a', until we come to a, in which are deposited the stones, schistose, and other matter whose specific gravity is greater than that of the valuable parts, and which falls, as above described, edgewise before the blast, so as to offer the least surface to the latter, being further favored by the increased velocity which it acquires in the course of its fall in the case C. It may then be said that the fragments or falling bodies traverse a trajectory deviating laterally from the vertical, so as to deposit themselves, according to their weight and volume, in the several compartments a a' a^2 a^3 a^4. It will be well understood that the

coal may be finally conducted to its destination along separate chutes leading from the compartments.

Fig. 2 illustrates an arrangement for obtaining the graduated current of air by means of a single nozzle. The exhaust-mouth M is of a suitable form in transverse section, and, as shown, is of the form of a truncated semicone in longitudinal section; consequently the current, owing to the diffusion, will be much weaker in the upper than in the lower part, where it acts more directly. I prefer, however, to employ the arrangement first described, because it enables the graduation to be regulated at will. When the coal has thus been separated from the fine dust on the one side and from the heavy stones on the other, it may be carried by chutes leading from each receptacle a' a^2 a^3 a^4 to the desired coal-bins.

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

1. The combination, with a case having a series of receptacles across its bottom, an open side, and means for introducing material at its upper part, of an air-conducting pipe and means for connecting it with the said case, substantially as described, whereby air may be admitted into the case at a varying pressure increasing from the top downward, as and for the purpose specified.

2. The combination, with a case having a series of receptacles across its bottom, an open side, and means for introducing material at its upper part, of a tuyere consisting of an air-distributing column provided with a series of nozzles placed one above another and connecting said column with said case, and a valve in each nozzle, substantially as described.

3. The combination of the case C, having the open side c', the compartments or apertures a a' a^2 a^3 a^4, the air-distribution column E, having the nozzles b', provided with graduating-cocks d, the bars f, arranged in alternating series, the distributing-cylinder A, and the hopper B, substantially as shown and described.

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Witnesses:
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