

Feb. 27, 1934.

A. J. REVELART

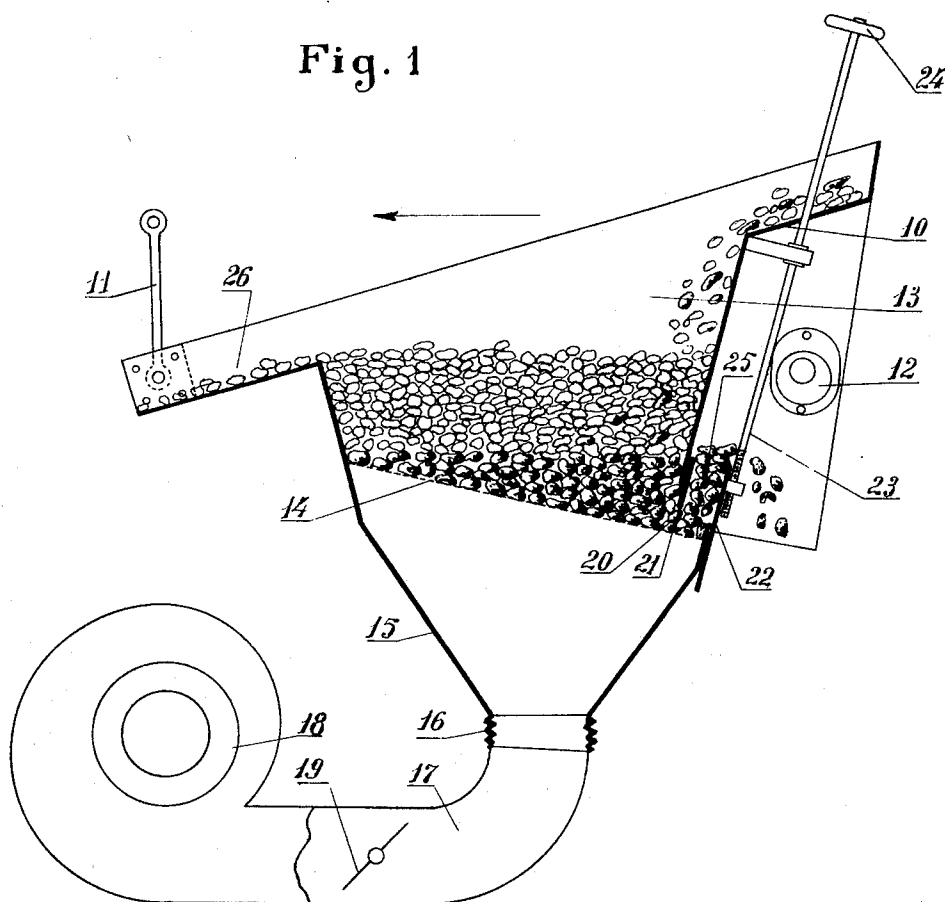
1,948,800

APPARATUS FOR REMOVING STONES FROM COAL

Filed May 27, 1930

2 Sheets-Sheet 1

Fig. 1



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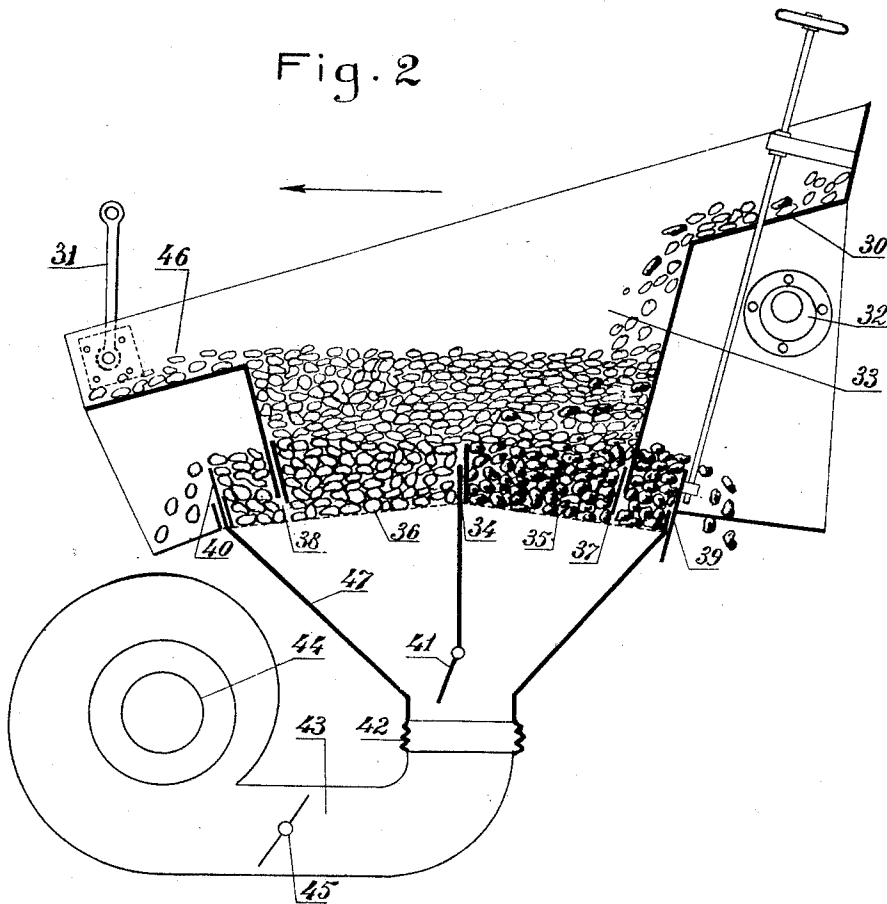
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2 Sheets-Sheet 2

Fig. 2



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UNITED STATES PATENT OFFICE

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APPARATUS FOR REMOVING STONES FROM COAL

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2 Claims. (Cl. 209—467)

The present invention relates to an apparatus for removing from coal the slate and the like which are mixed with the coal, without making it necessary to moisten the coal.

5 The said apparatus consists of a percussion frame comprising one or more chambers into which the coal is dropped, and whose perforated bottom allows the circulation of a strong current of ascending air. An adjustable discharge orifice is provided at the level of the said perforated bottom for the exit of the slate which is heavier than the coal and is hence less affected by the current of air, so that it will gradually descend to the bottom of the said chamber.

15 The accompanying drawings show various embodiments of the invention.

Fig. 1 is a sectional view of an apparatus according to the invention.

Fig. 2 is a like view of an apparatus adapted for double sorting.

Fig. 1 shows at 10 a percussion frame, known per se, which is suitably inclined and is suspended at its lower part by means of links 11, said frame being actuated by one or more mechanically driven eccentrics 12.

At the centre of the frame is disposed a large chamber 13 into which the coal is allowed to drop, and it is provided with a perforated wall 14 which is preferably inclined in the contrary direction to the frame 10. Below the said wall is a tapered funnel 15 whose lower aperture is connected by a flexible sleeve with the delivery conduit 17 of a blower 18 of suitable power. The amount of air delivered by the blower can be regulated by the register 19.

A discharge orifice 20 is provided at the level of the wall 14 and preferably at its lowest point, and it is controlled by a gate 21 whose position can be regulated; at the rear is a plate 22 which can be moved vertically by a rod 23 controlled by a hand wheel 24. The said wall 14 extends as far as the said plate 22.

The operation of the said apparatus is as follows:

45 The coal in the rough state drops upon the frame 10 at its highest part, that is, as shown in Figure 1, at the part opposite the links 11. The mass of coal falls into the chamber 13, whilst the air from the blower, which is regulated by the register 19, traverses the wall 14 and circulates vertically through the chamber 13. During this time, the said eccentrics shake the frame 10 in a continuous manner.

Each shock thus produced will cause a small amount of the coal to fall, and the ascending

current of air in the chamber will reduce the speed of descent of the coal, which is relatively light, but this will have much less effect upon the fall of the slate and other stony substances in the coal. Thus the slate will gradually descend in the mass of coal and will collect upon the perforated wall 14.

The slate which has collected upon the wall 14 proceeds to the lowest part of the same, that is to the right, and it issues through the orifice 20, then entering the space 25 comprised between the said gate 21 and the plate or screen 22. The slate proceeding to the orifice 20 will press upon the slate pieces already in the space 25, and hence these latter will rise, and will be brought upon the said plate, this discharge being facilitated by the action of the current of air traversing the part of the wall 14 situated below the space 25.

The operator uses the wheel 24 and the rod 23 to regulate the height of the screen 22 in such manner that the slate will be discharged during the sorting operation while the coal will not reach the aperture 20.

The coal in the pure state issues from the chamber 13 and is discharged through the conduit 26.

In the modification shown in Figure 2, the percussion frame 30, which is suspended as before by the links 21 and is shaken by the eccentrics 32, comprises a chamber 33 analogous to the chamber 13 shown in Figure 1. The said chamber is herein divided into two spaces by a middle partition 34 whose height is adjustable by suitable means. On either side of said partition, the lower part of the chamber 33 is bounded by two perforated walls 35—36, which are inclined in opposite directions, so that their highest part is adjacent the partition 34. As before, each chamber 35—36 comprises a discharge orifice 37, 38 having in the rear a respective vertically adjustable plate 39, 40.

Below the said walls 35—36 is disposed a tapered recipient 47 which is connected by a flexible sleeve 42 with the discharge conduit 43 of an air fan 44. This conduit comprises a register 45.

Below the partition 34 is a movable plate 41 for regulating the distribution of the air below the walls 35 and 36.

The operation of the apparatus is as follows:

The coal which drops into the chamber 33 is subjected to repeated shocks, and the heavy slate is discharged through the orifice 37. At the same time, the impurities of the coal which are lighter than the slate will remain at the surface of the layer of slate, and will finally

proceed beyond the partition 34. Thus these lighter impurities will collect upon the perforated wall 36 and will be evacuated through the orifice 38. The coal entirely freed from slate and the like will proceed beyond the chamber 33 and will issue through the discharge orifice 46 of the table 30.

It is thus observed that the apparatus shown in Figure 2 permits to remove from the coal not only the slate and other stones, but also the lighter substances which have a certain value.

Obviously, the invention is not limited to the aforesaid construction, and the details may be modified as desired without departing from the principle of the invention.

I claim:

1. An apparatus for the dry removal of stones from coal comprising a chamber adapted to receive the raw material at one end thereof, eccentrics supporting the chamber at this end, links pivoted to a fixed support and connected to the other end of the chamber at substantially the same level as the eccentric for rockably suspending that end of the chamber, said chamber having a perforated bottom positioned below the level of the eccentrics, a vertical partition at the middle of the perforated bottom, a hopper for the discharge of the lighter products provided substantially at the level of the eccentrics but

at the other end of the chamber, said chamber having an opening for the discharge of heavy products provided at the level of the perforated bottom at the end of the chamber supported by the eccentrics, said chamber having a second opening for the discharge of intermediate heavy products provided at the level of the perforated bottom at the end of the chamber opposite the eccentrics, and means for forcing a current of air upwardly through the perforated bottom.

2. An apparatus for the dry removal of stones from coal, comprising a deep chamber adapted to receive the raw material at one end thereof, eccentrics supporting the chamber adjacent this end, links pivoted to a fixed support and connected to the other end of the chamber at substantially the same level as the eccentric for rockably suspending that end of the chamber, said deep chamber having an inclined perforated bottom positioned below the level of the eccentrics and having an opening for the discharge of heavy products at the level of the perforated bottom and at the end adjacent the eccentric, said perforated bottom being inclined downwardly toward the opening for the discharge of heavy products, and means for forcing a current of air upwardly through the perforated bottom.

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