(No Model.) 2 Sheets—Sheet 1.

J. R. RICHARDSON.

COAL SEPARATOR.

No. 555,185. Patented Feb. 25, 1896.

Fig. I.

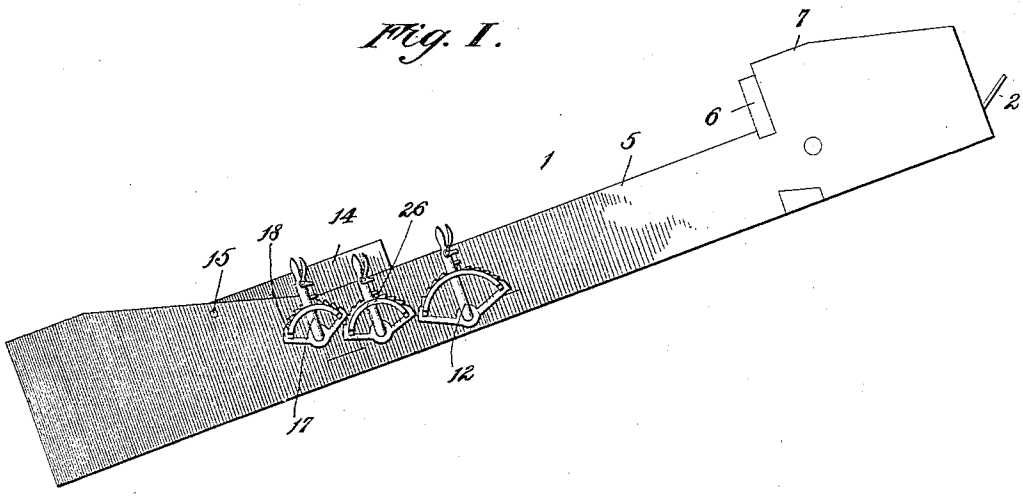
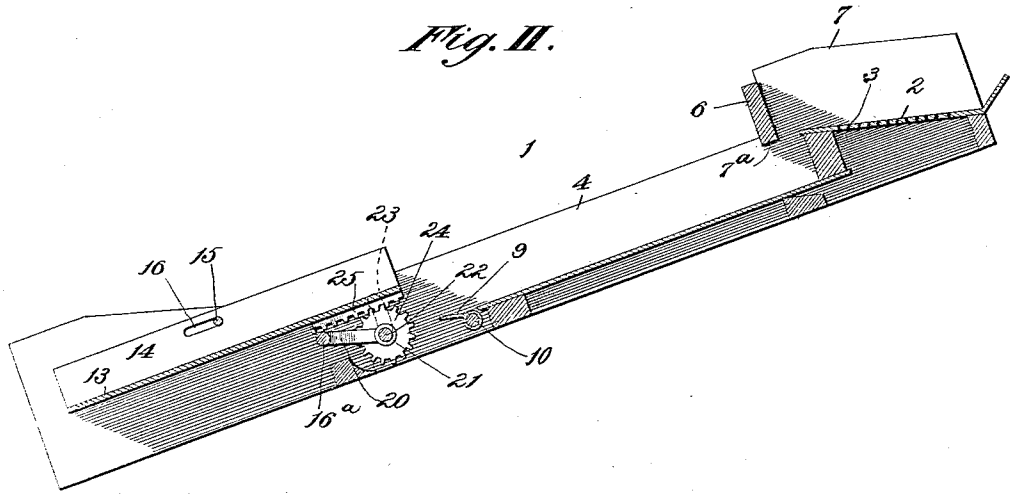


Fig. II.



Attest.
L. Mackey
A. E. Grant.

Inventor
John R. Richardson
By Joseph L. Atkins
Atty

(No Model.)

2 Sheets—Sheet 2.

J. R. RICHARDSON.

COAL SEPARATOR.

No. 555,185. Patented Feb. 25, 1896.

Fig. III.

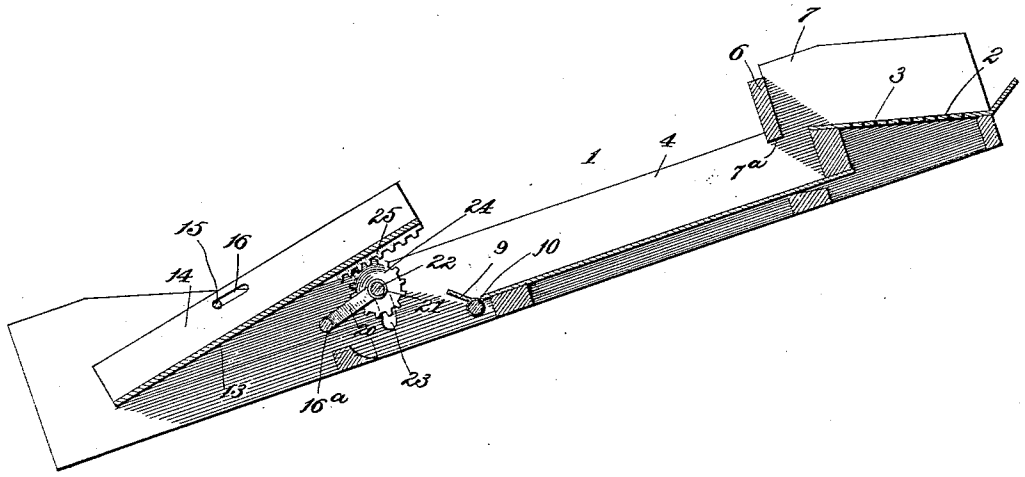
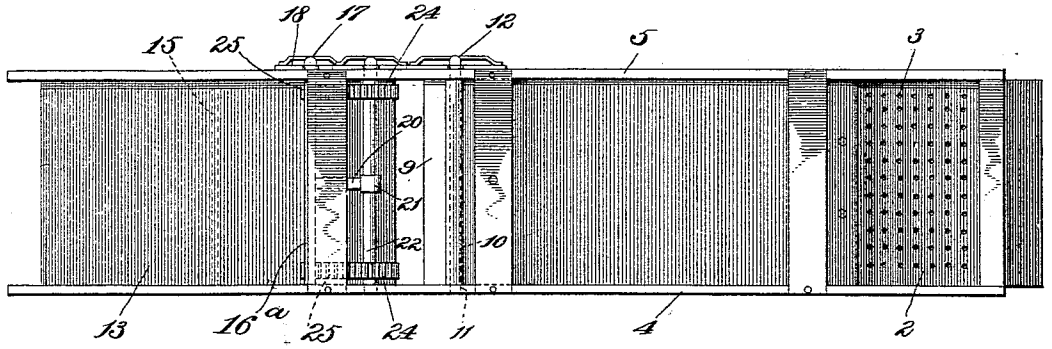


Fig. IV



Attest.
S. Mackey
A. E. Grant.

Inventor.
John R. Richardson.
By Joseph L. Atkinson
Atty.

UNITED STATES PATENT OFFICE.

JOHN R. RICHARDSON, OF SCRANTON, PENNSYLVANIA, ASSIGNOR OF FOUR-FIFTHS TO THOMAS R. HUGHES AND F. H. EMERY, OF SAME PLACE.

COAL-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 555,185, dated February 25, 1896.

Application filed April 26, 1895. Serial No. 547,208. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. RICHARDSON, of Scranton, county of Lackawanna, State of Pennsylvania, have invented certain new and useful Improvements in Coal-Separators, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to produce certain improvements in that class of coal-separators shown in my Patent No. 532,427, issued January 8, 1895, whereby the necessary adjustments are made separately instead of interdependently and certain provisions are introduced for increasing the general efficiency of the device.

In the accompanying drawings, Figure I is a side elevation of my machine. Fig. II is a central longitudinal section thereof in one adjustment. Fig. III is a similar view showing a change of adjustment, illustrating the operation of the parts. Fig. IV is a bottom plan view of my chute.

Referring to the figures on the drawings, 1 indicates a receiving-chute, which may be made of suitable shape and dimensions and of any suitable material—as, for example, sheet-iron. It is preferably provided with an elevated section 2 that is preferably perforated, as indicated at 3.

4 and 5 indicate the sides of the chute, which may be made continuous throughout the entire length of its various sections or parts or which may be made in separate sections. The elevated portion 2 is so constructed as to discharge against a dasher 6, which is held upon lugs or projections 7 that are secured to the sides of the chute. This dasher is located a suitable distance from the bottom of the chute, as indicated at 7^a, and is designed to receive the first impact of coal discharged upon the receiving-chute, so as to regulate the momentum with which it begins its descent through the chute. The chute may be vertically adjustable by any ordinary simple means, if desired, but the occasion for readjustment does not frequently occur in practice. At the lower extremity of the receiving-chute I provide a deflecting-plate 9. It may be carried upon a rock-shaft 10, secured in suitable bearings 11 in the sides of the chute. One end of the rock-shaft may be provided with a right-angled extension 12, which may be conveniently adjusted in any suitable position, as by means of a segmental rack on the side of the chute with which it engages. By this means any required angle of adjustment may be given to the deflecting-plate.

13 indicates a discharge-chute, which may be made of sheet-iron and provided with up-turned sides 14, though the special form illustrated is not essential to its operation. The discharge-chute should be adjustable to and from the receiving-chute and transversely to it, as and for the purpose of adapting the device for different grades of coal, it being well understood in the art that the heavier particles—as, for instance, the coal—will upon striking the deflecting-plate bound into the discharge-chute, the lighter or slaty particles passing under the discharge-chute.

It is apparent that as the coal is more or less slaty the distance between the deflecting-plate and the discharge-chute must be regulated to accomplish the best results.

The object of my present invention is to render such adjustment independent and effectual under all conditions of work which it has to perform.

15 indicates a transverse rod passing through the opposite sides of the chute and through slots 16 in the sides of the discharge-chute. By means of these slots the discharge-chute is made longitudinally movable, but is firmly supported between the sides 4 and 5 of the chute proper.

16^a indicates a crank-shaft pivoted in the sides 4 and 5 of the chute, provided with a right-angled extension 17 that works in a segmental rack 18 to afford the necessary adjustment. Other means of adjustment may, of course, be substituted for that shown.

In the end of the crank-arm 20 of the crank-shaft I provide a bearing 21, within which is mounted a pinion-shaft 22. The ends of the pinion-shaft move in transverse slots 23, preferably slightly curved to accommodate its movement around the crank-shaft 16. The pinion-shaft carries pinions 24 that are firmly secured to it. These work in racks 25 secured to the bottom of the discharge-chute and are adapted to move it backward and forward

upon the rod 15 into any required adjustment to and from the receiving-chute 1.

By actuating the crank-shaft any degree of elevation may be imparted to the upper end of the discharge-chute, and in any degree of elevation preferred the pinion-shaft is adapted to longitudinally actuate and adjust the discharge-chute. The adjustment mechanism indicated at 26, which may correspond to that previously described for the adjustment of other parts, may be employed for fixing the adjustment of the pinion-shaft. It is necessary, however, that some means be employed for holding the segmental rack of the adjustment mechanism 26 in the proper position when the shaft 24 is raised, and for this purpose I prefer to employ a projection upon the rack moving within a slot in the side of the frame, as shown; but any convenient means for properly retaining the rack may be employed.

By my present invention one pair of sides 4 and 5 is adapted to accommodate three different chutes, which are in effect bottom pieces—namely, the elevating-chute, the receiving-chute, and the discharge-chute. At the same time all necessary adjustments are effected in the component parts of the machine.

The operation of my present device will be clearly understood from the description of the general class to which it belongs given in my previous patent.

What I claim is—

1. In a coal-separator, the combination with a receiving-chute and a transversely and longitudinally adjustable discharge-chute in proximity to the lower end thereof, of a rock-shaft and deflecting-plate carried at the lower end of the receiving-chute, and mechanism for adjusting the angle of inclination of the deflecting-plate, substantially as specified.

2. In a coal-separator, the combination with a receiving-chute, of an elevated chute at its upper end, and a dasher located above the receiving-chute and beyond the extremity of the elevated chute, an adjustable deflecting-plate at the lower end of the receiving-chute, and a transversely and longitudinally adjustable discharge-chute adjacent to the lower end of the receiving-chute, substantially as specified.

3. In a coal-separator, the combination with a receiving-chute and discharge-chute, of a rock-shaft located at the lower end of the receiving-chute, and a deflecting-plate carried thereon, a crank-shaft designed to adjust the angle of inclination of the discharge-chute, a pinion-shaft and co-operating mechanism upon the pinion-shaft and discharge-chute, and means for actuating and adjusting the rock-shaft, crank-shaft and pinion-shaft, substantially as specified.

4. In a coal-separator, the combination with a receiving-chute, deflecting-plate, and chute sides, of a discharge-chute in proximity to the end of the receiving-chute, mechanism for elevating the end of the discharge-chute next to the receiving-chute, and mechanism for longitudinally adjusting the same carried on the elevating mechanism, substantially as set forth.

5. The combination with a receiving-chute, deflecting-plate and chute sides, of a discharge-chute longitudinally and pivotally movable between the chute sides, a crank-shaft carried in the chute sides, and mechanism for adjusting the same, a crank-arm thereon, a pinion-shaft pivotally carried by and near the end of the crank-arm, mechanism for adjusting the pinion-shaft, pinions secured to the pinion-shaft, and racks upon the bottom of the discharge-chute with which the pinions mesh, substantially as and for the purpose specified.

In testimony of all which I have hereunto subscribed my name.

JOHN R. RICHARDSON.

Witnesses:
THOMAS R. HUGHES,
FREDERICK H. EMERY.