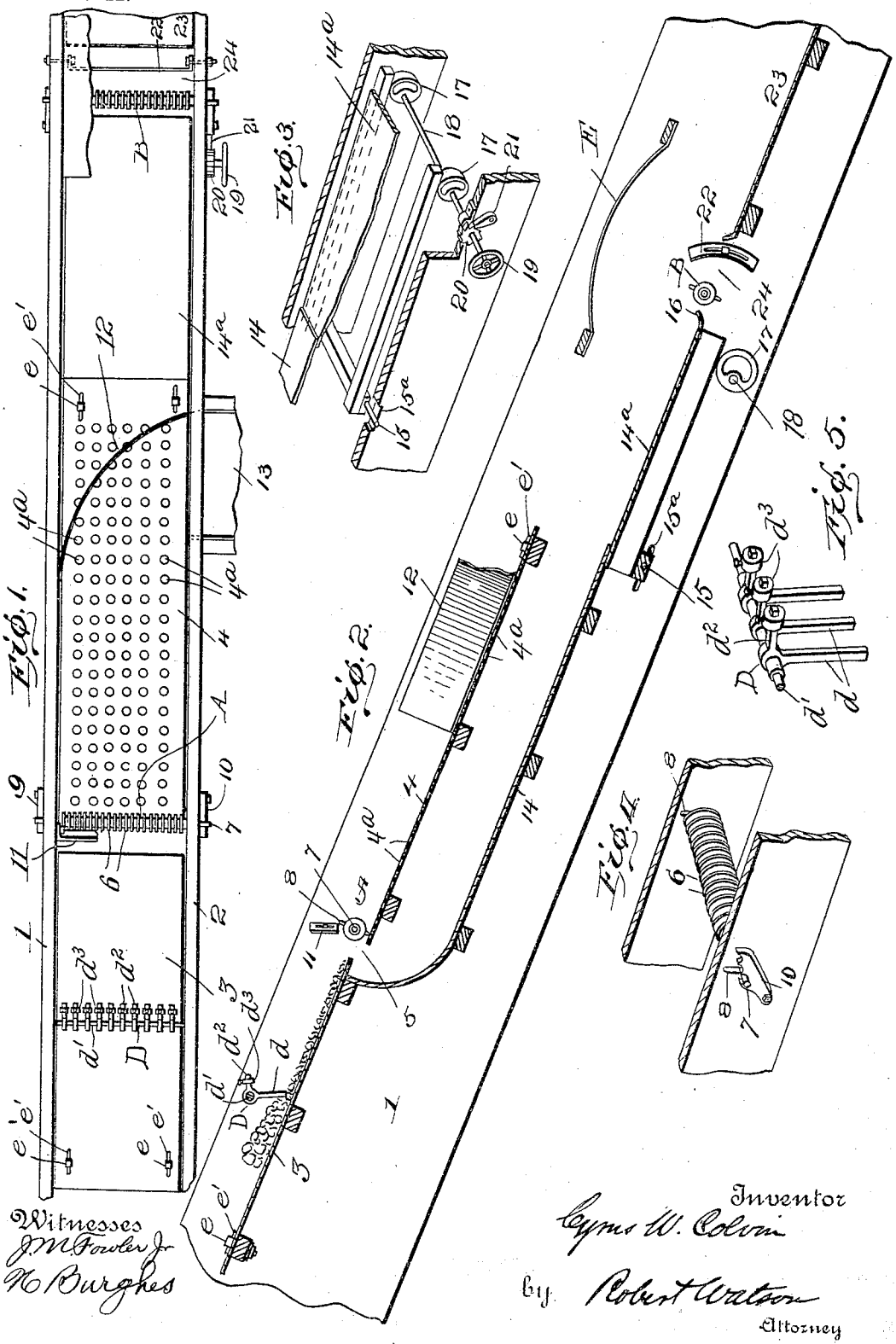
No. 773,928. PATENTED NOV. 1, 1904.

C. W. COLVIN.

SEPARATOR.

APPLICATION FILED FEB. 11, 1904.

NO MODEL.



Witnesses
J. M. Fowler Jr.
H. Burghes

Inventor
Cyrus W. Colvin
By Robert Watson
Attorney

No. 773,928. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

CYRUS W. COLVIN, OF SCRANTON, PENNSYLVANIA.

SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 773,928, dated November 1, 1904.

Application filed February 11, 1904. Serial No. 193,055. (No model.)

To all whom it may concern:

Be it known that I, CYRUS W. COLVIN, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Separators, of which the following is a specification.

My invention relates to separators for removing the slate and rock from coal, the details of which will be pointed out in the following specification, taken in connection with the accompanying drawings, in which—

Figure 1 is a plan view of the separator. Fig. 2 is a view showing the separator in longitudinal vertical section. Figs. 3 and 4 are detail perspective views of portions of the separator, and Fig. 5 is a detail perspective view of a portion of the feeding device.

Referring to the drawings, 1 and 2 indicate the sides of the separator-chute, between which the slides or inclined planes over which the material passes in the process of separation are arranged. A receiving-slide 3 is arranged at the upper end of the machine, and above this receiving-slide is arranged a feed-controlling device D, consisting of a series of metal bars d, loosely suspended from a rod d', which rod is transversely arranged above the slide 3, the ends of said rod being supported by the sides 1 and 2 of the separator-frame. These bars or drags d are spaced a short distance apart from one another, and their lower ends extend downwardly close to the surface of the slide. A short arm d^2 projects laterally from the upper end of each bar, the arm and bar forming a bell-crank lever. The arms d^2 project rearwardly from the bars d, or in the direction in which the coal travels upon the slide, and each arm d^2 is provided with an adjustable weight d^3, which, it will be plain from an inspection of Fig. 2, causes the bars or drags d to resist the movement of the body of coal, &c., upon the slide 3 and to allow only a thin layer of the material to pass downwardly upon the slide. The weights d^3 may be adjusted to vary the resistance of the drags to the movement of the coal as desired. This adjustment is desirable for material of different sizes and conditions. The number of bars and their distance apart will of course be regulated according to the width of the slide and the necessities of the case.

The slide 3 is adjustable longitudinally by means of bolts e, which extend through slots e' in the slide, and a similarly-adjustable slate-separating slide 4 is arranged in a plane a little below that of the slide 3, the upper end of the slide 4 being a short horizontal distance from the lower end of the slide 3 to provide a gap 5 between said slides. The width of this gap may be varied by adjusting either or both of the slides 3 and 4 longitudinally. The slide 4 is perforated, as indicated by the reference character 4^a, forming a sort of screen. Above the slide 4 and adjacent to its upper end is a roller A, arranged in the path of the material flowing from the section 3 and adapted to obstruct the flight of the coal in a horizontal direction and cause it to fall downward through the vertical gap between the lower end of the slide 3 at one side of the gap and the roller A and upper edge of the slide 3 at the opposite side of the gap. This roller, as shown, is conveniently made from a series of iron disks 6, arranged upon a shaft 7, which shaft is adjustable vertically in guide-slots 8, arranged in the side walls 1 and 2 of the chute. The ends of this shaft, as shown, are supported upon adjustable bearings 9 and 10, by means of which the roller may be raised or lowered with relation to the slide 4 to vary the distance or opening between the roller and said slide. An adjustable deflecting-plate 11 is arranged above the roller to prevent coal from passing over the roller onto the slide 4. The slate, which is heavy and mainly flat in form, moves slower than the coal downwardly over the slide 3 and drops from the lower end of said slide onto the upper end of the slide 4 and passing beneath the roller A moves downwardly over the slide 4 and is conducted by the curved guiding-partition 12 into a chute 13, arranged to receive and carry off the refuse. The slide or partition 4 thus divides the stream of material passing through the gap and conducts away the slate. The coal, which travels faster than the slate on the slide 3, is projected from the lower end of the slide

against the roller A or partition 11 and drops downwardly through the opening 5 onto a lower slide 14, arranged beneath the slate-separating slide or chute 4. Pieces of rock or slate which are too large to pass between the roller A and the slide 4 also drop through the opening 5 onto the lower slide 14. The material which strikes the roller A rotates the latter, and this rotation of the roller tends constantly to move the flat pieces of slate downwardly upon the slide 4 and to prevent clogging of the slate between the roller and said slide. Small pieces of coal which may pass beneath the roller A onto the slide 4 will drop through the openings or perforations 4^a onto the slide 14. In this manner a large portion of the slate is taken out by the slate-separating slide 4, and the larger pieces of slate or rock, as stated, pass downwardly on the lower slide 14. The slide 14 has a lower section 14^a, the upper end of which is supported upon a shaft 15, having its ends resting in slots 15^a, extending longitudinally in the sides of the separator-frame, and the section 14^a may therefore be adjusted longitudinally. This slide-section terminates in an upwardly-curved portion or projector 16, which deflects the moving material upwardly and causes it to project or fly farther from the end of the slide than it would if the upwardly-turned portion or projector were omitted. The inclination of the slide-section 14^a may be varied to suit the various sizes and conditions of the material by means of cams 17, mounted upon a cam-shaft 18, having a hand-wheel 19 at its outer end and a ratchet-wheel 20, which is engaged by a pawl 21, the ratchet-wheel and pawl serving to hold the cams in any desired position. A roller B is arranged adjacent to the projector 16, and this roller is constructed the same as the roller A and supported and adjustable vertically in the same manner. A vertically-adjustable separating-partition 22 is arranged a short distance beyond the roller B, leaving a gap 24, and a slide-section 23 is arranged with its upper end adjacent to said partition. The coal in passing downward over the slide 14 acquires a momentum which carries it over the partition 22, while the rock, which travels at a slower speed, strikes the roller B and passes through the gap 24 between the roller B and the partition 22 and is thence conducted to the refuse heap. The roller B is kept in constant rotation by the heavy pieces of rock passing over it, and smaller pieces will be carried over by the rotation of the roller. A guard E is arranged over the projector 16, roller B, and separating-partition to prevent coal from being projected out of the separator. Flat pieces of slate which happen to strike either of the rollers edgewise will of course pass into the spaces between the disks and drop through. The pure coal is carried off on the coal-chute 23.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a coal-separator, an upper or receiving slide, a device arranged transversely of the slide at a short horizontal distance from its lower end, thus providing a vertical gap or opening between said device and slide, said device being arranged to obstruct the flight of the coal passing from said slide and cause the coal to drop downward through the gap, and a slate-separating slide or partition arranged in a plane below said receiving-slide and having its upper end extending beneath said device and into position to divide the stream of material passing through said gap.

2. In a coal-separator, an upper or receiving slide, a shaft arranged tranversely of the slide and having a series of disks thereon arranged in the path of the material passing from said slide, and at a short distance from the lower end of the slide to provide a gap or opening for the material to fall through between said disks and slide, and a slate-separating slide arranged in a plane below said upper slide and having its upper end extending beneath said disks and into position to divide the stream of material passing through said gap.

3. In a coal-separator, an upper or receiving slide, a roller arranged in line with the material passing from said slide, and at a short distance from the lower end of the slide to provide a gap or opening for the material to fall through between said roller and slide, and a slate-separating slide arranged in a plane below said upper slide and having its upper end extending beneath said roller and into position to divide the stream of material passing through said gap.

4. In a coal-separator, an upper or receiving slide, a roller arranged in line with the material passing from said slide, and at a short distance from the lower end of the slide to provide a gap or opening for the material to fall through between said roller and slide, means for adjusting said roller vertically, and a slate-separating slide arranged in a plane below said upper slide and having its upper end extending beneath said roller and into position to divide the stream of material passing through said gap.

5. In a coal-separator, an upper or receiving slide, means for adjusting said slide longitudinally, a roller arranged in line with the material passing from said slide, and at a short distance from the lower end of the slide to provide a gap or opening for the material to fall through between said roller and slide, and a slate-separating slide arranged in a plane below said upper slide and having its upper end extending beneath said roller and into position to divide the stream of material passing through said gap.

6. In a coal-separator, an upper or receiving

slide, a roller arranged in line with the material passing from said slide, and at a short distance from the lower end of the slide to provide a gap or opening for the material to fall through between said roller and slide, a slate-separating slide arranged in a plane below said upper slide and having its upper end extending beneath said roller, and into position to divide the stream of material passing through said gap, and means for adjusting said slate-separating slide longitudinally.

7. In a coal-separator, an upper or receiving slide, a roller arranged in line with the material passing from said slide, and at a short distance from the lower end of the slide to provide a gap or opening for the material to fall through between said roller and slide, a slate-separating slide arranged in a plane below said upper slide and having its upper end extending beneath said roller, and into position to divide the stream of material passing through said gap, and means for adjusting both of said slides longitudinally.

8. In a coal-separator, an upper or receiving slide, a roller arranged in line with the material passing from said slide, and at a short distance from the lower end of the slide to provide a gap or opening for the material to fall through between said roller and slide, a slate-separating slide arranged in a plane below said upper slide and having its upper end extending beneath said roller, and into position to divide the stream of material passing through said gap, a lower slide arranged below the slate-separating slide and having its upper end extending beneath said gap, a projector at the lower end of said lower slide, a roller adjacent to said projector, and a separating-partition adjacent to said roller.

9. In a coal-separator, an upper or receiving slide, a roller arranged in line with the material passing from said slide, and at a short distance from the lower end of the slide to provide a gap or opening for the material to fall through between said roller and slide, a perforated slate-separating slide arranged in a plane below said upper slide and having its upper end extending beneath said roller, and into position to divide the stream of material passing through said gap, a lower slide arranged below the slate-separating slide and having its upper end extending beneath said gap, and a separating-partition adjacent to the lower end of said lower slide.

In testimony whereof I affix my signature in presence of two witnesses.

CYRUS W. COLVIN.

Witnesses:
N. L. REICHARD,
WM. R. JONES.