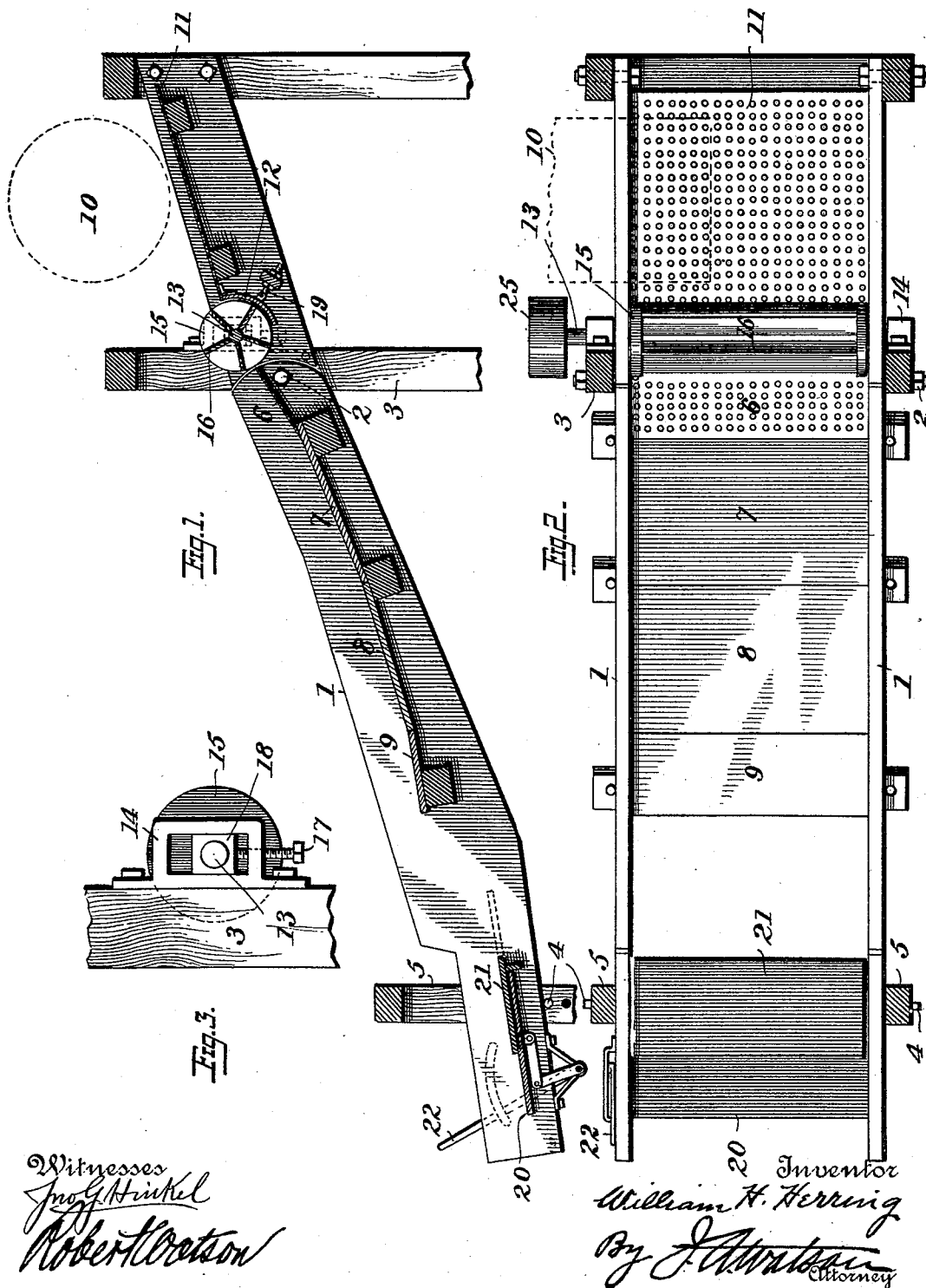


(No Model.)

W. H. HERRING.
COAL SEPARATOR.

No. 520,524.

Patented May 29, 1894.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM H. HERRING, OF WILKES-BARRÉ, PENNSYLVANIA.

COAL-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 520,524, dated May 29, 1894.

Application filed October 6, 1893. Serial No. 487,316. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. HERRING, a citizen of the United States, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Coal-Separators, of which the following is a specification.

My invention relates to dry separators for assorting materials of different structure, and it is particularly designed for separating the slate which occurs with anthracite coal from the coal.

The principle upon which my improved machine operates is based upon the fact that the slate which occurs with coal, when crushed, breaks into more or less flat pieces, while the coal crushes into pieces which are more nearly cubical or round. As a result of this difference in form, when the combined slate and coal is thrown onto an inclined surface, the coal will slide at a comparatively rapid rate, while the slate will slide and be retarded by frictional contact with the bottom of the chute or incline. On leaving the incline the two will separate, the coal, on account of its greater momentum, being deposited at some distance from the incline, and the slate dropping almost vertically from its lower edge. If a partition plate or wall be adjusted at the proper distance from the lower edge of the incline, the coal will pass over it and be deposited upon one side of the partition, while the slate will drop upon the other.

The above outlined mode of operation is well known in the art, and need not be further described.

My present invention consists in an improved machine for separating substances in accordance with this principle.

In the accompanying drawings, in which like reference signs refer to similar parts throughout the several views,—Figure 1. is a longitudinal central section of a machine embodying my invention. Fig. 2. is a plan view of the same, and Fig. 3. is a view of a portion of the machine upon a larger scale.

In the drawings 1 1 indicate the sides of a chute, which sides are pivoted at 2 2 to a framework 3. The lower end of the chute may be adjusted vertically by any suitable means. As shown, it is supported by pins 4

adjustable in a portion 5 of the frame work. The bottom of the main portion of the chute consists of a series of inclines 6, 7, 8 and 9, arranged at different angles with the horizontal. The upper section 6 is preferably made of a perforated plate of sheet steel having a rise or pitch of eight inches, more or less, to the foot. The sections 7, 8 and 9 are preferably composed of cast iron, and each is set with less pitch than the preceding one; that is, the section 7 has a pitch of about five and one-half inches in twelve, while the section 8 has a lower pitch and the section 9 one still less, its rise being about two inches in twelve.

The mixed coal and slate is preferably delivered directly from a screen 10 upon an inclined perforated plate 11, the object of the perforations being to aid in screening the coal. To the lower edge of the plate 11 is connected by a hinged joint, a cylindrically curved plate 12, preferably of cast iron. Between the curved plate 12 and the upper edge of the plate 6, is arranged a feed wheel which transfers coal and slate from the upper perforated plate 11 to the plate 6. This feed wheel is arranged nearly or quite concentric with the curved plate or apron 12, and it consists, as shown, of a shaft 13 adjustably mounted in bearings 14 and provided with spiders or end plates 15, and radial blades or paddles 16, supported by the plates. The feed wheel may be adjusted vertically in any suitable manner, such as by the set-screws 17, which are arranged to vary the height of the bearing blocks 18. As shown it is rotated by means of a pulley 25. The hinged apron 12 is also slightly adjustable to and from the feed wheel, which adjustment may be made in any suitable manner, as, for instance, by means of the hinged bolt and locking nuts shown at 19 in Fig. 1. At some distance horizontally from the lower edge of the plate 9, and eight inches, more or less, below the same, is arranged a plate 20, having an adjustable section 21, which is adapted to be moved toward and away from the plate 9, to vary the opening between them. As shown, the plate 21 is arranged to slide on top of the plate 20, and is adjusted by means of a lever 22 and intermediate connections.

The various adjustments are provided for

in order to adapt the machine for different sizes and qualities of coal.

In operation the coal is deposited upon the upper perforated plate 11, either upon the screen 10, or in any other manner, and it slides down upon the feed wheel. The functions of the feed wheel are to transfer the coal from the upper plate to the separating plate, and to aid in spreading the coal into a thin layer upon the latter plate. By giving the feed wheel the proper speed of rotation, the coal will be thrown with some force upon the upper perforated plate 6, thus shaking some of the adhering dirt from it, which sifts through the plate, and giving the slate and coal an impetus which greatly adds to the efficiency of the separating plate. In practice the wheel throws the coal upon the separating plate and starts it rolling down the incline just as if it were thrown by hand or a shovel, and the velocity thus acquired is sufficient to carry it over the flatter lower sections of the separating incline and onto the lower inclines 21, 22. The slate, however, on account of its flat formation and greater specific gravity, slides along the separating plate and drops through the opening between said plate and the lower incline 21.

For any particular grade of coal the movable plate 21 can be set by the eye after the coal is started, so as to separate out the slate. The larger grades of coal will of course gain greater momentum and jump over a greater opening than the smaller grades, and therefore, for the smaller sizes the opening must be less than for the larger.

It will be evident that various changes in the proportions and minor details of construction may be made without departing from the spirit of my invention. Thus, for

instance, it is not absolutely essential that the feed wheel should have blades, as shown, for it will be evident that any construction having teeth or cavities which will receive and transfer the coal would answer the purpose.

Therefore, without limiting myself to the exact construction and arrangement of parts shown and described, I claim—

1. In a coal separator the combination with the inclined separating plane, of a feeding and starting wheel arranged across the upper end of the plane and having blades or paddles for throwing the coal upon said plane, and means for delivering coal to the feed wheel, substantially as described.

2. In a coal separator the combination with the inclined frictional separating plane of a feeding and starting wheel arranged across the upper end of the plane and having blades or paddles for throwing the coal thereon, of a second chute having its lower end adjacent to the wheel and a curved apron or plate below said lower end and partially surrounding the feed wheel, substantially as described.

3. In a coal separator the combination with the inclined frictional separating plane having its upper section perforated, of a feeding and starting wheel arranged across the upper end of said plane, and having blades or paddles for throwing the coal upon the perforated portion thereof, and means for delivering the coal to the feeding and starting wheel, substantially as described.

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

WM. H. HERRING.

Witnesses:

HARRY C. MASON,
DAVID COTTLE.