

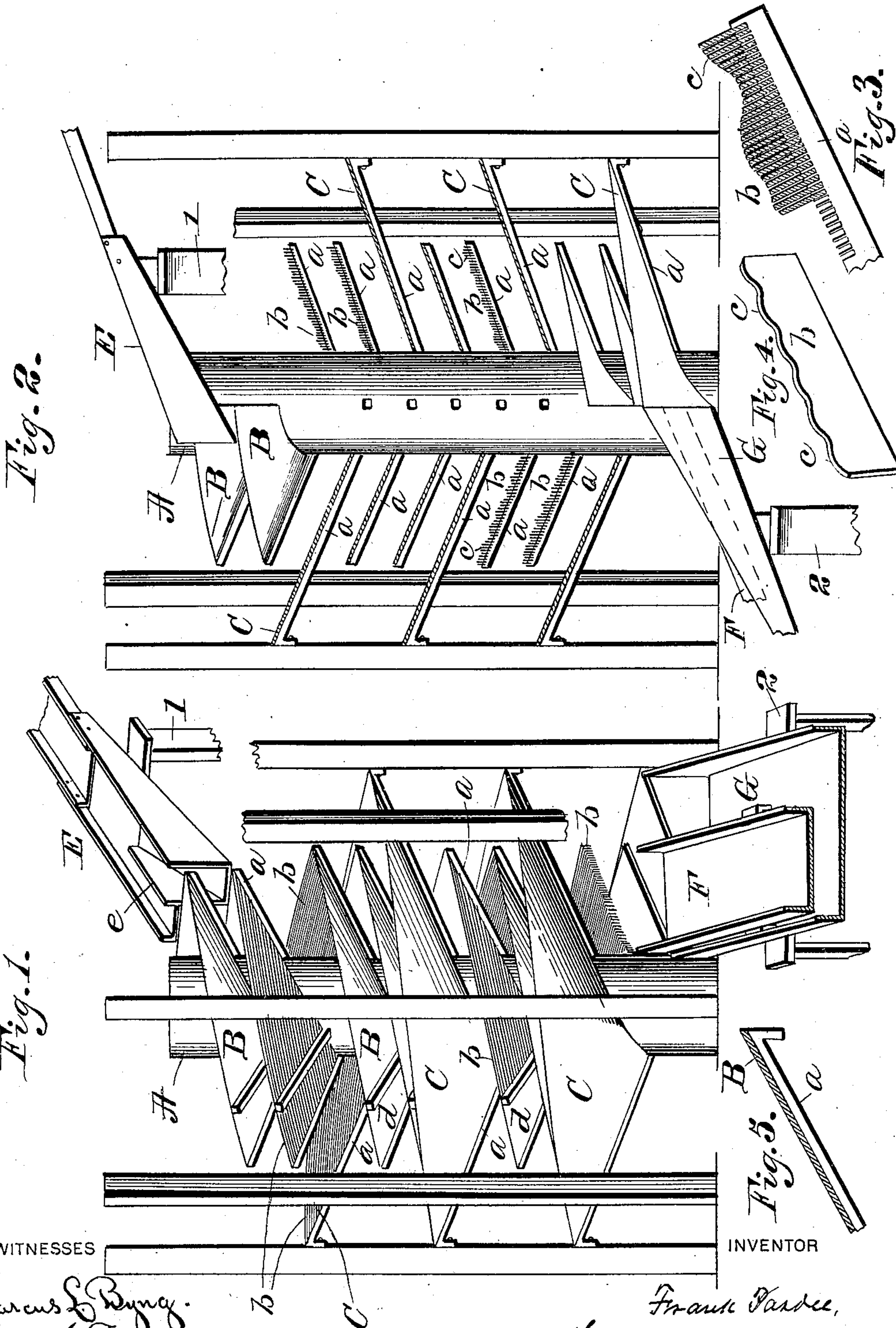
No. 629,594.

Patented July 25, 1899.

F. PARDEE.
SEPARATOR FOR ORE, COAL, &c.

(Application filed Nov. 18, 1898.)

(No Model.)



WITNESSES

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UNITED STATES PATENT OFFICE.

FRANK PARDEE, OF HAZLETON, PENNSYLVANIA.

SEPARATOR FOR ORE, COAL, &c.

SPECIFICATION forming part of Letters Patent No. 629,594, dated July 25, 1899.

Application filed November 18, 1898. Serial No. 696,764. (No model.)

To all whom it may concern:

Be it known that I, FRANK PARDEE, a citizen of the United States, and a resident of Hazleton, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Separators for Ore, Coal, &c., of which the following is a specification.

My invention relates to separators having one or more inclined spiral ways for producing centrifugal motion of the substances requiring separation; and its object is to so construct the spiral way or ways as to insure an advantageous action of the separator.

To this end the invention consists in providing the machine with a spiral or curved way the floor whereof comprises strips of metal set edgewise and secured in place, and in one of its forms the floor of the spiral also comprises sheet metal turned broadside; and the invention further consists in the particular constructions, as hereinafter described, and indicated or pointed out in the claims.

In the drawings, Figure 1 is an elevation of a machine embodying the invention. Fig. 2 is a vertical view of the same, partly in section. Fig. 3 is a detail of the metal strips used in the formation of the floor of the spiral way and of a supporting arm or bracket, showing a portion of the strips in place thereon. Fig. 4 is a side view of a strip having a serpentine edge. Fig. 5 is a detail view of one of the supporting-arms with the impervious bottom thereon in section.

As the invention is designed more especially for the separation of coal from slate and from "bone" or coal containing thin layers of slate, it will be described as applied to such purpose and in connection with a machine having more than one spiral way, although it is applicable to other uses and to various forms of machines or separators having spiral ways for producing centrifugal action.

In the drawings, A represents a central supporting column or post, to which upwardly-inclined arms or brackets *a a* are secured. These arms are preferably made of metal and of sufficient width to admit of spaces being sawed or formed therein, so as to make a comb edge, as shown in Fig. 3. The spaces thus formed receive the metallic strips *b b*, which may be cut from sheet metal of any

length and placed edgewise within the spaces formed on the upper side or edge of the supporting-arms.

The strips *b b* are easily bent to give the proper curves, and when thus arranged in the spaces on the supporting-arms they will require no further fastening. The upper edges of the strips will when they are all in place be sufficiently close to form a floor over which solid substances may pass for separation. As this floor will be somewhat rough and interrupted by the different edges of the strips, the frictional resistance to the different substances passing through the machine will give a better separation than a continuous smooth surface. The coal being subject to less resistance than either the slate or the bone will pass rapidly over the surface or floor of the smaller spirals B and drop on the larger spirals C, while the bone will come near the outer edge of the smaller spiral and the slate will be nearest the center of the same when the several substances emerge from the machine.

The strips *b b* may, if desired, be made to form humps or waves *c c* or other undulating surfaces by having the spaces which receive them on the arms *a a* vary in depth or by having the strips widened or deepened at certain places and so arranged that a raised or depressed surface is formed by the proximity of varying widened parts on the adjoining strips.

In Figs. 1 and 2 the floor of the spiral way is shown as being formed in part of continuous strips and in part of sections of sheet metal D turned broadside, interposed, and secured on some of the supporting-arms, as shown; but the entire floor may, if desired, be composed of strips set edgewise.

The floor of the spiral may be made either with or without waves, humps, or other forms of undulating surfaces; but in making such a surface on a spiral comprising sheet-metal sections turned broadside it is desirable as a matter of economy to make the raised portions on the broadside sections D D, which can be shaped as required prior to being secured in position on the supporting-arms.

In a machine having more than one spiral-way, as shown, it is not essential that the floor of each spiral should be composed in whole

or in part of the strips set edgewise, as the different spirals may vary in construction one from another and yet embody the improvement; neither is it necessary that the details of construction shown by the drawings be adhered to, as variations can readily be made by which the invention is carried into effect.

The drawings illustrate a complete machine connecting with a chute E, divided by a partition e, for admitting the substances to be separated, as mixed coal and slate, at the top of the smaller spirals B, down which it passes in a whirl, the coal being carried by the centrifugal force and less frictional resistance over the outer edge of the same and onto the larger spiral C, while the slate passes toward the central supporting column or post A and the bone on the outer edge of the smaller spiral. The substances thus separated may emerge from the machine by suitable discharging-chutes F G, arranged to receive the materials from the respective spirals. The chute by which the material is conducted to the machine may be supported by any suitable means, as by a bench 1, and the discharge-chutes are similarly supported by a bench 2, as indicated in Figs. 1 and 2 of the drawings.

I do not herein claim the features of construction of spiral separators which are made the subject-matter of the application filed by me on May 17, 1898, Serial No. 680,987, nor do I herein claim the features of such a machine which form the subject-matter of the several applications filed by me on November 18, 1898, Serial Nos. 696,761, 696,762, 696,763, 696,765, 696,766, and 696,767, respectively, to which reference is hereby made; but,

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

1. In a separator for ore, coal, &c., a suitably-supported spiral way, provided with a floor having a retarding-surface composed of strips of metal set on edge and arranged so as to form an undulating floor, whereby part of the material passes over the edge of the spiral way, and the other part which offers greater frictional resistance is retained till discharged at its lower end, substantially as described.

2. In a separator for ore, coal, &c., a suitably-supported spiral way, provided with a floor having a retarding-surface composed of strips of metal set on edge and arranged to form a floor, whereby part of the material passes outwardly on the spiral way, and the other part which offers greater frictional resistance is kept nearer the axis until dis-

charged at the outlet, substantially as described.

3. A separator for ore, coal, &c., having a suitably-supported spiral way the floor of which comprises strips of metal set closely together edgewise and adapted to act as a retarding-surface whereby the material offering the greater frictional resistance will be retained on the spiral way until discharged at the lower end, while the material offering the least resistance will pass across and off the spiral way, substantially as described.

4. A separator for ore, coal, &c., having a suitably-supported spiral way provided with a floor having an undulating retarding-surface composed of metal strips set edgewise, whereby part of the material passes toward the outer edge of the spiral way and the other part which offers greater frictional resistance is retarded on the inner portion thereof until discharged at the outlet of the spiral, substantially as described.

5. A separator for ore, coal, &c., consisting of a suitably-supported spiral way provided with a floor comprising strips of metal set edgewise, and sheets of metal laid broadside over which solid substances may pass for separation, and whereby the substances to which the least frictional resistance is presented will descend along the outer edge of the spiral and the substance to which the greater frictional resistance is offered will be retarded and move closer to the axis of the spiral, substantially as described.

6. A separator for ore, coal, &c., consisting of a suitably-supported spiral way provided with a floor comprising strips of metal set edgewise and sheets of metal laid broadside and provided with undulating surfaces over which solid substances may pass for separation, whereby the substance to which the least frictional resistance is presented will descend along the outer edge of the spiral and the substance to which the greater frictional resistance is offered will be retarded and move closer to the axis of the spiral way, substantially as described.

7. A separator for ore, coal, &c., having a suitably-supported spiral way, the retarding-floor of which comprises strips of metal set edgewise and curved, said floor being provided with a pitch toward the axis and the outlet for substances passing along said spiral way.

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Witnesses:

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