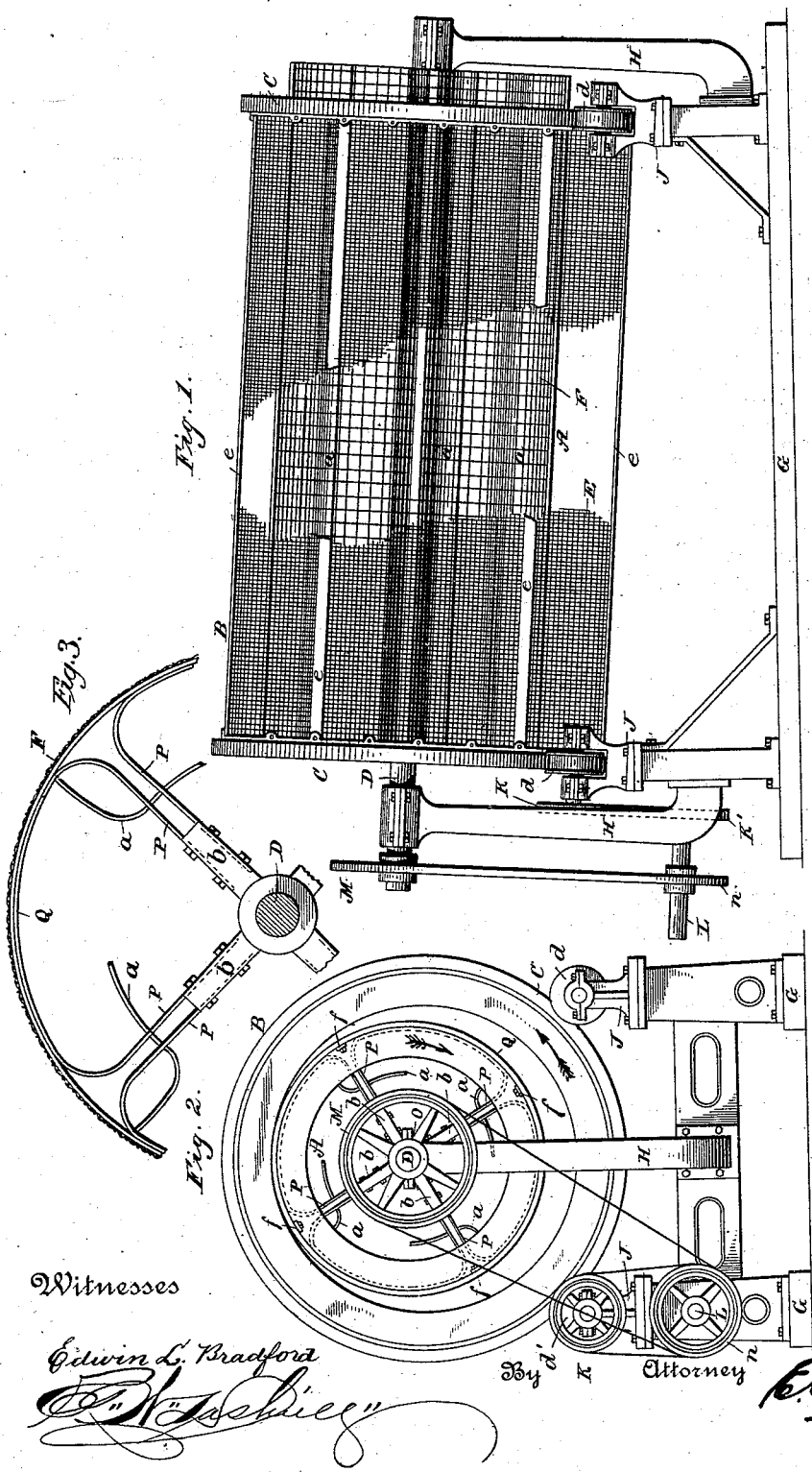
(No Model.)

G. W. PARKER.

SEPARATOR FOR COAL OR OTHER SUBSTANCES.

No. 455,601. Patented July 7, 1891.



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SEPARATOR FOR COAL OR OTHER SUBSTANCES.

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To all whom it may concern:

Be it known that I, GEORGE W. PARKER, a citizen of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented certain new and useful Improvements in Separators for Coal or other Substances; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for separating and grading coal, ore, sand, or similar substances.

The object of the invention is to effect a more perfect separation of the several grades than is accomplished by any similar machine as heretofore constructed, and also to simplify the construction of the parts generally and very materially lessen the cost of manufacture.

A further object of the invention is to provide a greater separating capacity with less separating-surface than is obtained in any former machine for a like purpose, thereby greatly diminishing the space usually occupied by such machines.

Another purpose of the invention is to construct the inner and outer separators in such a manner that each may be free to revolve independently and in opposite directions, thereby causing the substance to be separated to be brought in contact with more separating-surface, thus effecting a further separation of the several grades.

Still another purpose of the invention is to prevent lateral and longitudinal movement of the separator and to have the inner and outer separators eccentrically journaled, the opposing surfaces approaching and being nearest at a point directly over the axis of the said separators.

A further purpose of the invention is to convey the substance to be treated to the highest point of the inner separator and to deliver it from the same to the highest point, as well as to all other points of the outer separator, thereby materially increasing the screening or separating capacity of the machine.

A further purpose of the invention is to provide a machine for the purpose set forth which will be simple, compact, efficient, and perform its work in a rapid and more satisfactory manner with a minimum expenditure of power compared with the capacity and working capabilities of other machines.

The improvement consists of the novel features and the peculiar construction and combination of parts which will be hereinafter more fully described and claimed, and which are shown in the annexed drawings, in which—

Figure 1 is a side view, parts being broken away, of a separator embodying my invention. Fig. 2 is an end view of the machine as seen from the end to which the driving devices are applied. Fig. 3 is an enlarged detail view of certain parts to more clearly indicate construction and arrangement.

In carrying my invention into effect I provide a base and project vertically therefrom at or near each end a double standard, the lower members of which carry supporting-rollers on which is mounted the outer separator, and the higher member of which forms a journal-bearing for the end of the shaft on which the inner of the two separators is mounted. One set of these rollers on one side of the separators is positively driven from a countershaft, thereby transmitting motion to the said separators, and these rollers are flanged, the flanges embracing the annular rims on the said outer separator and that portion between the flanges forming a bearing-support for the said rims to travel on in the rotation of the said outer separator. This outer separator is composed of end rings and intermediate rings, if desired, longitudinal bars secured to the said rings and extending lengthwise of the separator, and wire-cloth stretched over the said longitudinal bars, which bars form a support for the said wire-cloth, being secured at its end to the end rings and intermediate of its ends to the said longitudinal bars and intermediate rings, if the same are provided.

The inner separator is journaled with its shaft eccentric to the outer separator, its axis being directly above the axis of the outer separator, so that the outer surface of the inner separator will be nearer to the inner surface of the outer separator at the upper portion of the same than at any other point. A series of lifting wings or scoops *a* is arranged upon the inner surface of said inner separator for the purpose of carrying

the substance to be treated up upon the rising side of the separator and again discharging it against the descending side of the same by gravity, the substances sliding off from the wings or scoops as they arrive at the uppermost positions and striking the descending side. The two cylinders are driven in opposite directions, and the substance which passes through the descending side of the inner separator will be carried upon the ascending inner surface of the outer separator and thrown back into the inner separator when too coarse to pass through the side of the outer separator, so that the substance or material to be treated will receive a very thorough treatment. By arranging the separators eccentrically, one within the other, and with the inner separator near the upper side of the outer separator the substance carried up upon the ascending side of said outer separator will be crowded between the separators, and thus forced into the inner separator.

The inner separator is composed of hubs or spiders O, having radiating arms *b*, and the converging ends of truncated sector-shaped frames P are secured to said arms. The outer sides of said frames form segments of the circle forming the circumference of the cylinder and have rings secured to them, which form supports for the wire-netting covering the separator and for the wings or scoops *a*.

Referring to the parts of the machine by letter, A represents the inner separator, and B the outer separator; G, the base having the standards H and J. The standards J J are pairs and separated sufficiently to form supports for the outer separator B. These standards are provided at their upper ends with forked bearings, in which the spindles of the rollers *d d* and *d'* are journaled. The rollers *d' d* are keyed on a shaft which extends lengthwise of the separator and which is provided at its outer end with a band-wheel K, which is connected by a belt with a corresponding band-wheel K' on the counter-shaft L. These rollers have flanges which embrace the rims or rings C of the outer separator, and which hold the said separator from longitudinal movement.

e are the slats, which extend lengthwise of the outer separator, and which are secured to the end rings or rims C and to such other rims as may be provided intermediate of the end rims.

E is the wire-cloth, which is secured to the slats *e* and to the rims or rings C. In the event of rings or rims being arranged between the end rings or rims, it has been found expedient to provide standards J in corresponding number and supply the same with rollers to support the said rings.

The shaft D passes through the separator A and is journaled at or near its ends in the standard H and has a band-wheel M on its projected end, which is connected by a belt with a band-wheel *n* on the counter-shaft L. The hub O on the shaft D is provided with a series of radial arms *b*, to which are secured the ends of the truncate sector-shaped frames P, to which the bands or rings Q are secured to form supports for the longitudinal bars *f*, to which the netting F is secured.

a are the wings, which are secured to the slats *f*. These rings or bands Q, with the frames P and the arms *b*, form supports between the shaft D and the slats *f* and may be provided in sufficient number to give stability to the inner separator.

The wire covering of the inner separator is of coarser net than the covering of the outer separator, and both separators are journaled with their axes slightly inclined to one end. The substance to be treated is fed into the inner separator at the higher end through any suitable chute or hopper.

In practice the substance to be treated as it is fed into the inner separator will be carried upward by the wings or scoops *a* and screened through the side of the inner separator. When the wings or scoops arrive at their uppermost position, they will dump the substance against the descending side of the inner separator, and the finer substance will pass through said side and will strike the ascending side of the outer separator, which will carry the particles which do not pass through it upward and throw them back through the sides of the inner separator. In this manner, it is obvious, the substance to be treated will be thrown forward and back and thoroughly screened.

Having thus described my invention, what I claim as new is—

1. In a separator for coal or similar substances, the combination of an outer cylindrical separator provided with a fine wire covering, an inner cylindrical separator provided with a coarser wire covering journaled eccentric to said outer separator, and with its axis above the axis of the same, and provided with wings or scoops upon its inner side, open in the direction of its revolution, and means, substantially as described, for revolving said separators in opposite directions, substantially as shown, and for the purpose set forth.

2. In a separator for coal or similar substances, a separating-cylinder consisting of hubs or spiders having radiating arms, truncate sector-shaped frames having their inwardly-converging ends secured to said arms, bands or rings secured to the segmental sides of said frames, and a wire covering secured over said bands or rings, substantially as described.

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

GEO. W. PARKER.

Witnesses:
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