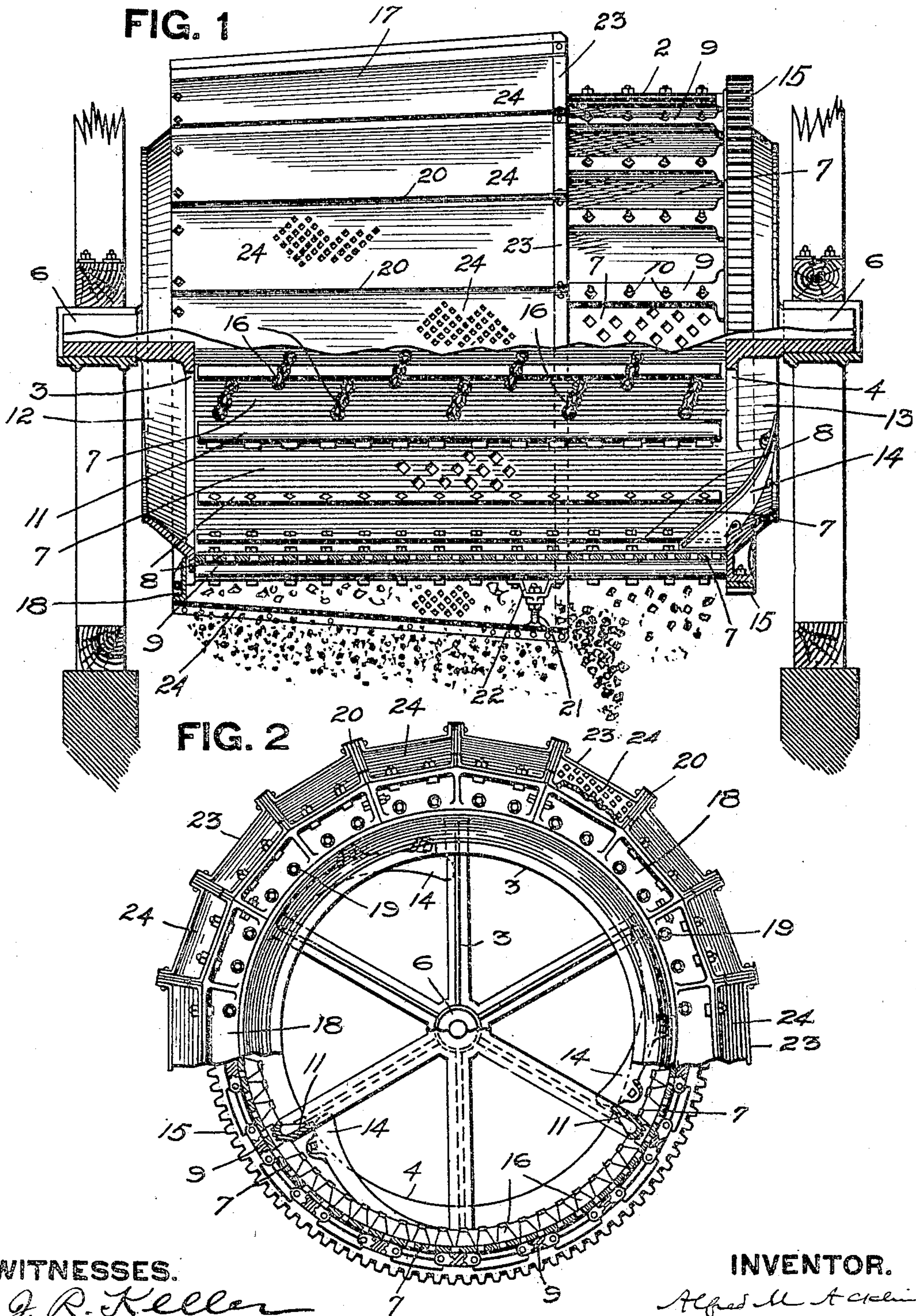


No. 787,885.

PATENTED APR. 25, 1905.

A. M. ACKLIN.
COAL BREAKER.

APPLICATION FILED MAR. 28, 1904.



WITNESSES.

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ALFRED M. ACKLIN, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HEYL AND PATTERSON, OF PITTSBURG, PENNSYLVANIA, A COPARTNERSHIP OF PENNSYLVANIA.

COAL-BREAKER.

SPECIFICATION forming part of Letters Patent No. 787,885, dated April 25, 1905.

Application filed March 28, 1904. Serial No. 200,302.

To all whom it may concern:

Be it known that I, ALFRED M. ACKLIN, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Coal-Breakers; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to coal-breakers, and more especially to that style of breaker which comprises a rotary perforated cylinder with shelves arranged therein longitudinally thereof adapted to lift the coal and drop the same as the cylinder is rotated. The coal is fed to one end of the cylinder and by an arrangement of spiral arms is gradually fed toward the opposite or discharge end of the cylinder, the broken coal passing through the perforations, while the harder slate and sulfur balls will be discharged from the opposite end of the cylinder. The coal which has been broken up by the rotation of the cylinder passes through the perforations in the walls of the cylinder and is conveyed to suitable bins or further reduced, if necessary. Some of the coal fed to the breaker is sufficiently fine as it comes from the mine to pass through the perforations without further reduction, and as the breaker revolves this fine coal passes from the breaker and is mingled with that of a coarser quality, so that a further screening of the product of the breaker is necessary to separate these different sizes. Furthermore, in breaking up the coal to the required size to pass through the perforations there is a certain quantity broken up much finer than necessary, and this, too, is mixed with the larger size as it passes from the breaker.

The object of my invention is to provide a coal-breaker of the character described in which provision is made for separating the different grades of coal by the breaker itself.

To these ends my invention comprises, generally stated, a rotary perforated cylinder, having an inlet at one end and a discharge-outlet at the opposite end, with means therein for lifting and dropping the coal and for discharging the refuse from the discharge-

outlet and a perforated jacket inclosing said cylinder and secured thereto, said jacket extending from the receiving end of said cylinder to a point beyond the mid-point thereof and outwardly flaring and entirely open at its outer end, whereby the coal from the cylinder drops into said jacket and that which is fine enough passes through the perforations of said jacket, while the coarser coal is discharged from the end of the jacket.

To enable others skilled in the art to make and use my invention, I will refer to the accompanying drawings, in which—

Figure 1 is a front elevation of my improved coal-breaker with the cylinder and perforated jacket partly broken away and partly in section; and Fig. 2 is an end view, partly broken away and in section.

Like numerals indicate like parts in each view.

The numeral 2 designates a rotary cylinder comprising the spiders 3 and 4, with the journals 6 adapted to be supported within bearings in a suitable frame. The perforate plates 7 form the walls of the cylinder, and said plates are connected by means of the inner and outer strips 8 and 9, joined by bolts 10. Within the cylinder and extending lengthwise thereof are the shelves 11, which may be secured in any suitable manner and at proper intervals apart. The cylinder is provided with the receiving end 12 and the discharge end 13, said discharge end being provided with spiral guides 14, which act to carry the slate and sulfur balls out the discharge end. The discharge end is further provided with the gear 15, adapted to mesh with a suitable power-driven gear for rotating the cylinder at the proper speed. Within the cylinder are the spirally-arranged arms 16, which act to feed the coal gradually from one end of the cylinder to the other.

All the parts thus far described constitute a well-known form of coal-breaker and form no part of my invention, wherefore further detailed description of same is not deemed necessary.

Surrounding the cylinder 2 for a portion of its length is the perforated jacket 17. This

jacket consists of the polygonal frame 18, bolted to the receiving end of the cylinder by bolts 19. The frame 18 is provided with the conically-diverging ribs or bars 20, which extend to a point preferably beyond the mid-portion of said cylinder. The outer ends of the ribs 20 are secured, by means of bolts 21, to the brackets 22 on the cylinder. A band or strip 23 connects the outer ends of the ribs 20, so as to strengthen the frame 18. Between the ribs 20 of the frame 18 are the plates 24, provided with perforations of the proper size, but smaller than those of the cylinder 2. The jacket 17 therefore incloses the cylinder 2 for the greater portion of its length and is supported at a distance from the periphery thereof to leave the necessary space between the jacket and cylinder.

The coal is dumped into the receiving end of the cylinder 2, and as the said cylinder rotates the coal is lifted by the shelves 11 and dropped therefrom, so as to be broken by the fall. That portion of the coal introduced to the cylinder which is already fine enough will pass directly through the perforations in the plates 7 into the jacket 17. With this coal will be a quantity of finer grade, which will sift through the smaller perforations of the jacket and will fall into a suitable receptacle below. That which is too coarse to pass through the perforations of the jacket will be carried to the discharge end of said jacket, owing to the flaring construction of said jacket. The coal discharged from the end of the jacket will drop into a suitable receptacle below. As the cylinder continues to rotate this separation of the grades of coal continues, while the coal within the cylinder is gradually carried toward the discharge end of the cylinder, and by the time it has passed beyond the point where the jacket extends all the fine coal will practically have passed from the cylinder, so that what passes through beyond that point will pass directly from the cylinder to the receptacle below. This coal which is discharged from the end of the jacket, as well as any which falls from the cylinder beyond said jacket, is conveyed to suitable crushing-rolls, where it may be re-

duced to the proper size. By the use of the perforated jacket that which has been reduced to a sufficient degree of fineness passes through the perforated jacket and is ready to go directly to the washers, whereas without the use of such a perforated jacket all the coal discharged directly from the breaker would have to pass through the crushers in order to reduce that which was not sufficiently reduced by the breaker, or else the entire product of the breaker would have to be rehandled and screened in order to separate the coarser particles from the finer, so that the coarser particles might be passed through suitable rolls for reducing it to the desired degree. The slate and sulfur balls are not, as a rule, reduced sufficiently to pass through the perforations of the cylinder and are accordingly carried to the end of said cylinder, where they are carried out by the action of the spiral guides 14.

What I claim is—

1. In a coal-breaker, the combination of a rotary perforated cylinder of uniform diameter having an inlet at one end and a discharge-outlet at the opposite end, with means for conveying the refuse out the discharge end, means therein for lifting and dropping the coal, and a perforated jacket extending from the receiving end of said cylinder to a point beyond the mid-point thereof, said jacket having its outer end entirely open.

2. In a coal-breaker, the combination of a rotary perforated cylinder of uniform diameter having an inlet at one end and a discharge-outlet at the opposite end, with means for conveying the refuse out the discharge end, means therein for lifting and dropping the coal, and an outwardly-flaring perforated jacket extending from the receiving end of said cylinder for a portion of the length of said cylinder, said perforated jacket having its outer end entirely open.

In testimony whereof I, the said ALFRED M. ACKLIN, have hereunto set my hand.

ALFRED M. ACKLIN.

Witnesses:

ROBERT C. TOTTEN,
G. KREMER.