

No. 770,819.

PATENTED SEPT. 27, 1904.

W. J. PATTERSON.  
COAL BREAKER.

NO MODEL.

APPLICATION FILED DEC. 19, 1903.

3 SHEETS—SHEET 1.

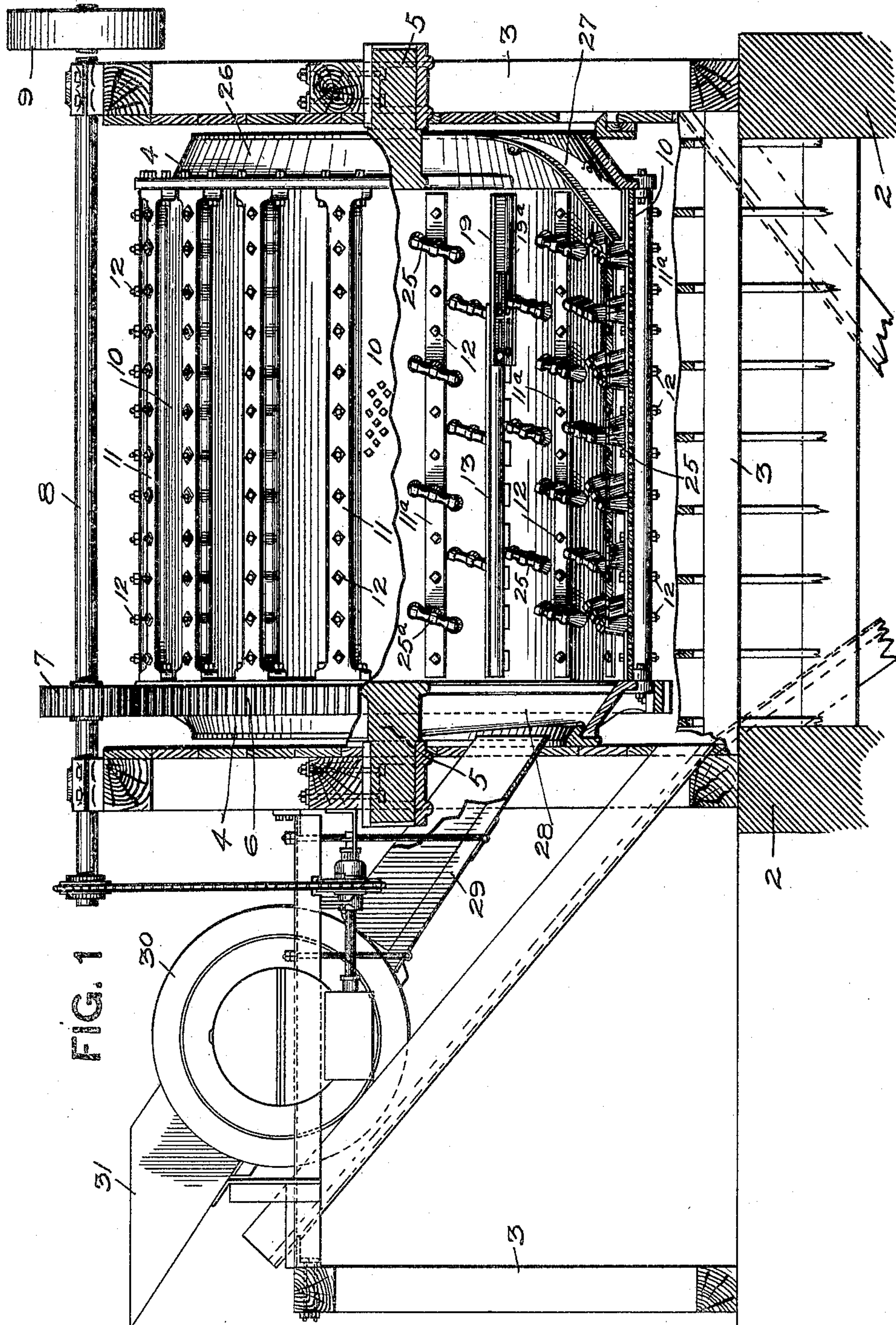


FIG. 1

WITNESSES.

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*Robert C. Lott*

INVENTOR.

*William J. Patterson*  
*By Kay Lott & Winter*  
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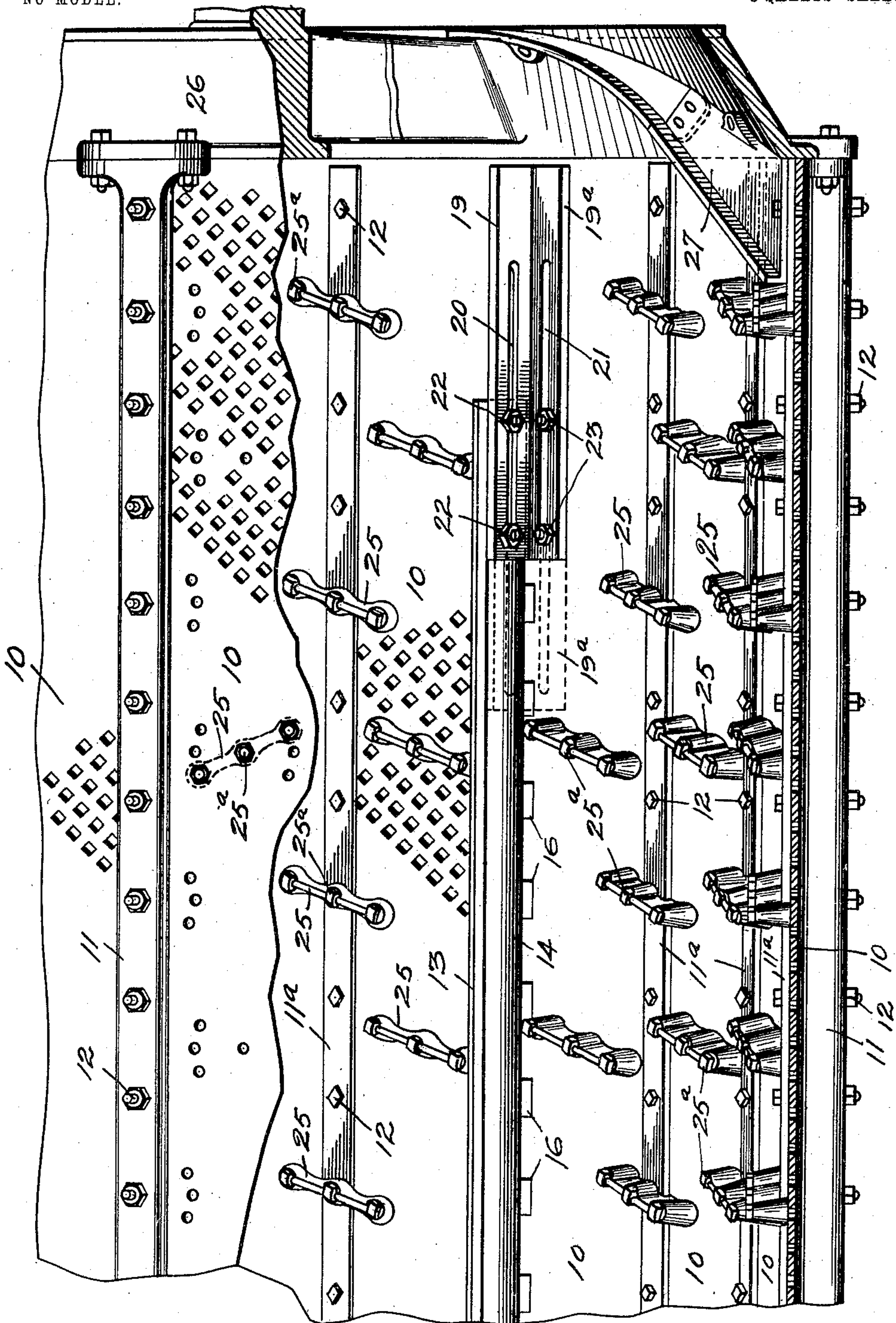
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3 SHEETS—SHEET 2.



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FIG. 2

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3 SHEETS—SHEET 3.

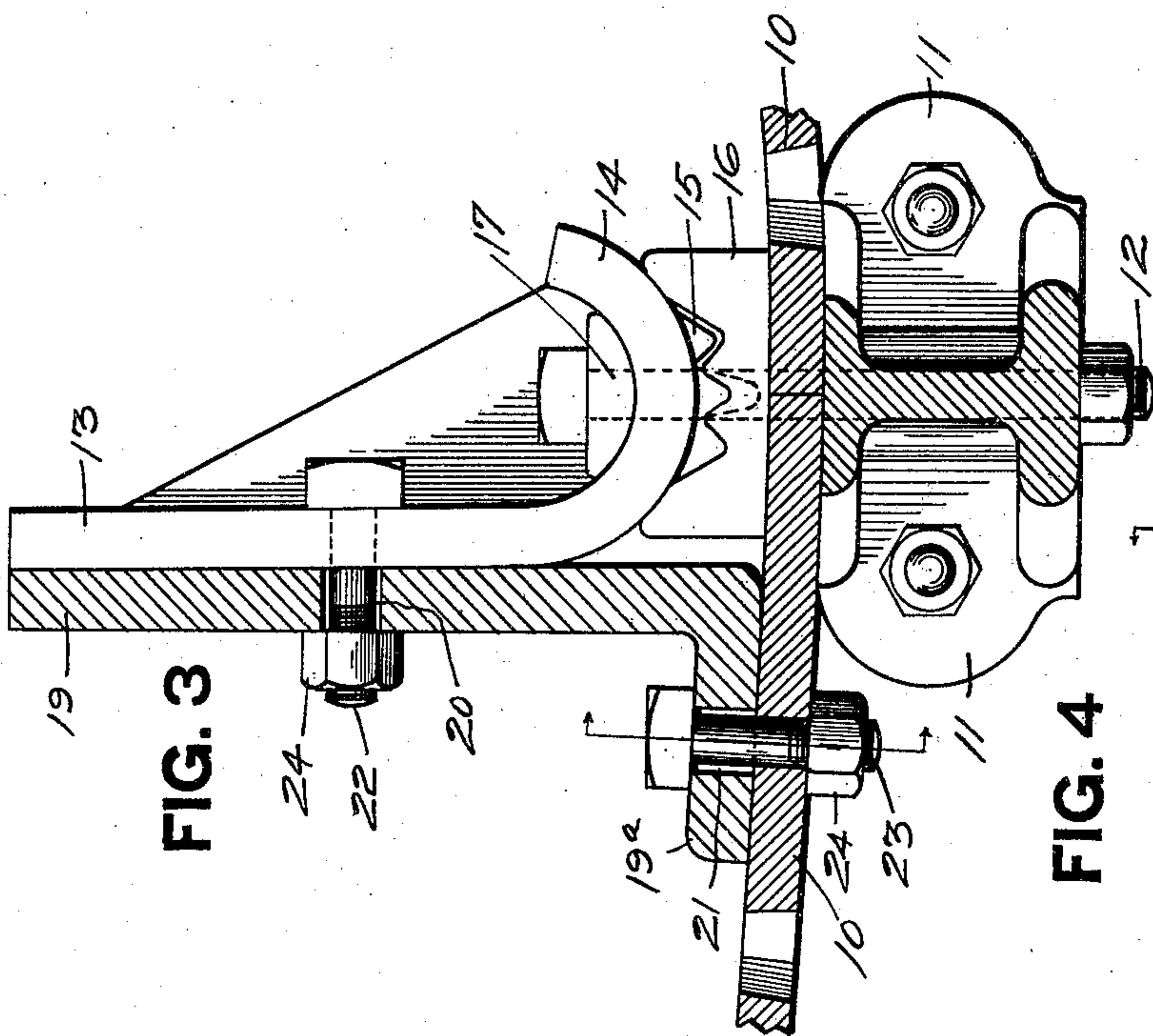


FIG. 3

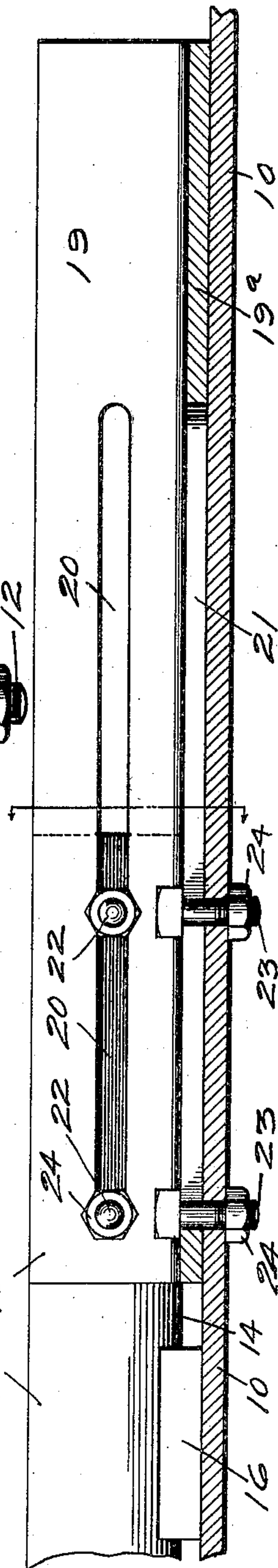


FIG. 4

WITNESSES.

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# UNITED STATES PATENT OFFICE.

WILLIAM J. PATTERSON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO  
HEYL & PATTERSON, OF PITTSBURG, PENNSYLVANIA, A PARTNERSHIP  
OF PENNSYLVANIA.

## COAL-BREAKER.

SPECIFICATION forming part of Letters Patent No. 770,819, dated September 27, 1904.

Application filed December 19, 1903. Serial No. 185,812. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. PATTERSON, 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 particularly to that class of coal-breakers comprising a rotary cylinder having shelves therein which are adapted to lift the coal and drop it as the cylinder revolves, so that the coal is broken and that which is of the proper degree of fineness falls through perforations in said cylinder, while the slate, sulfur balls, or harder substances are discharged from one end of the cylinder, so as not to mix with the screened coal.

The object of my invention is to provide a coal-breaker like the above in which the breaking up of the slate, sulfur balls, or other harder substances to the same degree of fineness as the coal is prevented, so that such impurities will not pass through the perforations and be mixed with the coal so broken.

To these ends my invention consists, generally stated, in a coal-breaker having a shelf extending longitudinally thereof adapted to lift the coal and other substances within the breaker and means for varying the length of said shelf according to the requirements of the substances to be separated.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a front elevation of my improved breaker, partly in section. Fig. 2 is an enlarged front view of the cylinder, partly broken away and in section. Fig. 3 is an enlarged cross-section of the shelf of my improved breaker, the extension and cylinder being shown in section; and Fig. 4 is a longitudinal rear view of the shelf, partly in section.

Like numerals indicate like parts in each view.

As stated above, my invention relates to that class of coal-breakers in which a cylinder is employed with shelves adapted to lift

the coal and drop the same, so as to be broken, the coal passing through perforations in said cylinder and the impurities being carried to and discharged at the end of said cylinder. I have accordingly illustrated my invention in connection with such a breaker, and as my invention relates particularly to the shelf construction it will only be necessary to describe in general the construction of the breaker illustrated.

The numeral 2 designates a suitable support for the breaker-frame 3. The cylinder 4 is provided with the journals 5, supported in the frame 3, said cylinder having the cog-wheel 6, with which the pinion 7 on the shaft 8 meshes. This shaft 8 has the pulley 9, which may be connected up to any suitable source of power. In this manner a rotary movement is imparted to the cylinder 4. The cylinder 4 is made up of the circular perforated plates 10, which are connected by the inner and outer strips 11 11<sup>a</sup>, respectively, secured by the bolts 12.

Within the cylinder 4 are the shelves 13, said shelves having the curved portion 14, with the lugs 15, adapted to enter corresponding seats in the blocks 16. The shelves 14 are secured in place by means of the bolts 17 passing through the curved portion 14, the blocks 16; and through the perforated plates 10 of the cylinder. These bolts also pass through the outer strips 11. These shelves secured in this manner extend with their main portion substantially the length of the cylinder and are provided with the lengthwise-adjustable extension 19. This extension 19 is provided with the slots 20 21 and is secured to the main portion of the shelf by means of the bolts 22 and 23, the bolts 22 passing through the slot 20 and the bolts 23 through the slot 21 in the flange 19<sup>a</sup>. By tightening up the nuts 24 on said bolts the extension 19 is securely attached to the shelf proper. These shelves may be arranged at suitable intervals within the cylinder as may be found necessary.

Secured within the cylinder at proper intervals are the guiding-blocks 25, said guiding-blocks being arranged with reference to



each other so as to form spiral grooves within the cylinder, so that in the rotation of the cylinder these grooves will tend to carry the coal from the feeding end of the cylinder to the discharge end. These guiding-blocks 25 are held in place by means of bolts 25<sup>a</sup>, and the angle of these blocks may be varied according as it is desired to feed the coal more rapidly from the feed end to the discharge end of the cylinder. The cylinder is provided with the discharge-head 26, and in order to direct the impurities or refuse to this discharge the spiral chute 27 is employed.

Connected to the feed end 28 of the breaker is the chute 29, which is connected with the feeder 30. This feeder may be of ordinary construction and as it forms no part of my invention needs no further description.

A hopper 31 is connected to the feeder 30. The coal to be broken is fed to the hopper 31 and passing through the feeder 30 is discharged into the chute 29, whence it passes into the cylinder 4. As the cylinder rotates the coal is carried up by the shelves 13, and when the shelf passes beyond a certain point the coal is dropped into the cylinder and by the force of its fall is broken. That portion of the coal which is of the proper degree of fineness passes through the perforations, while the larger pieces are again lifted by the next succeeding shelf and dropped in the same manner. In the meantime the coal has been fed toward the discharge end of the machine by the action of the spirally-arranged guiding-blocks 25, and by the time the coal has reached the discharge end all will have been broken to the proper degree of fineness to pass through the perforations, with the exception of the slate and sulfur balls, which are of a harder quality, and these will pass out through the spiral chute 27 to be discharged from the discharge end 26 of the cylinder.

If in the operation of the machine it is found that the harder substances are being reduced to such degree of fineness as to pass through the perforations with the coal and it is desired to prevent this, the bolts 22 and 23 are loosened and the extension 19 of the shelf is moved

back a proper distance to reduce the length of the shelf. The bolts are now adjusted and the machine put in operation, when it will be apparent that by the shortening of the shelf the substances will not be lifted so often by the shelves, and consequently not subjected to so many falls. The material instead of being lifted by the shelf after it passes beyond the same will merely be given a tumbling-barrel action throughout the last portion of the cylinder. By my improvement, therefore, it is possible to regulate the machine to a nicety, and the same machine may be used for coal of different quality, so that the mixing of the impurities with the coal is prevented.

What I claim is—

1. In a coal-breaker, the combination of a rotary cylinder, a shelf extending longitudinally thereof, and means for varying the length of said shelf.
2. In a coal-breaker, the combination of a rotary cylinder, a shelf extending longitudinally thereof, and a movable section on said shelf.
3. In a coal-breaker, the combination of a rotary cylinder, a shelf extending longitudinally thereof, a movable section on said shelf, and means for securing said section in place at different positions on said shelf.
4. In a coal-breaker, the combination of a rotary cylinder, a shelf extending longitudinally thereof having a slot formed therein, a section having a slot, and bolts passing through said slots.
5. In a coal-breaker, the combination of a rotary cylinder, a shelf extending longitudinally thereof having a slot formed therein, a section having a slot, bolts passing through said slots, said section having a flange having a slot therein coinciding with an opening formed in said cylinder, and bolts securing said flange to said cylinder.

In testimony whereof I, the said WILLIAM J. PATTERSON, have hereunto set my hand.

WILLIAM J. PATTERSON.

Witnesses:

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G. C. RAYMOND.