

942,461.

3 SHEETS—SHEET 1.

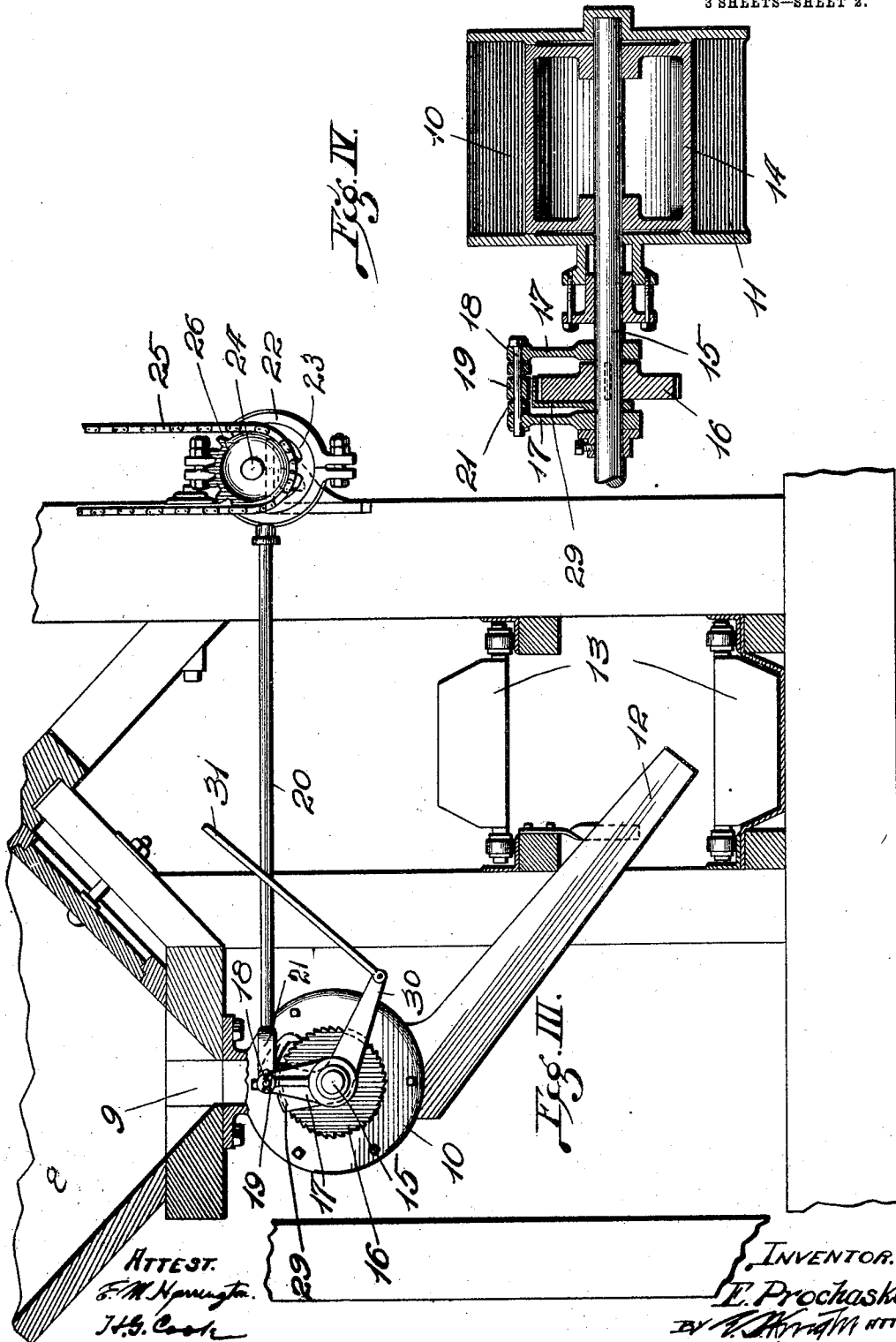


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COAL OR ORE WASHER.
APPLICATION FILED JAN. 23, 1909.

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Patented Dec. 7, 1909.

3 SHEETS—SHEET 2.

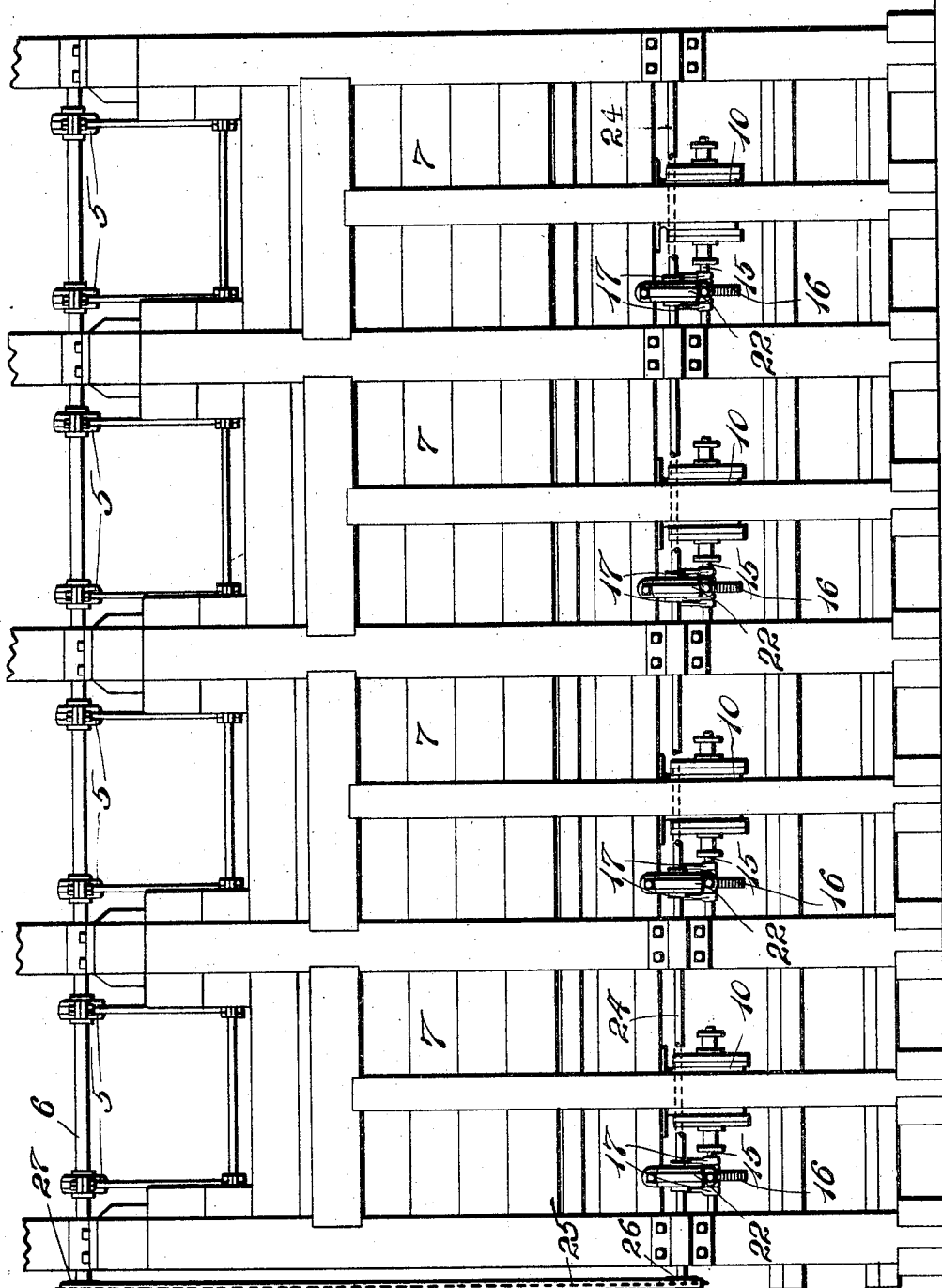


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3 SHEETS—SHEET 3.



ATTEST.

F. M. Harrington.
E. B. Kimm.

Fig. 1.

INVENTOR.

ERNEST PROCHASKA.
BY *[Signature]*

UNITED STATES PATENT OFFICE.

ERNST PROCHASKA, OF ALTON, ILLINOIS.

COAL OR ORE WASHER.

942,461.

Specification of Letters Patent.

Patented Dec. 7, 1909.

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To all whom it may concern:

Be it known that I, ERNST PROCHASKA, a citizen of the United States of America, residing at Alton, in the county of Madison and State of Illinois, have invented certain new and useful Improvements in Coal or Ore Washers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to means for controlling the discharge of slate, ore, or other relatively heavy matters from the washing tanks of coal or ore washers after they have been deposited in said washing tanks from the jigs of the washers, the object of the invention being to provide means whereby said heavy matters may be discharged separately from each of a battery or series of washers assembled with each other, and operable in a manner to provide for each outlet being continually in a closed condition.

A further object of the invention is to provide for the separate discharge of heavy matters from the several washing tanks independent of each other, with the object in view of permitting examination of the heavy matters delivered from each tank without mixture of the matters discharged from the several tanks.

Figure I. is a vertical cross section through a washer equipped with my device. Fig. II. is a front elevation of the end washer of a battery of washers. Fig. III. is in part an enlarged vertical section of the lower portion of a washer and in part an elevation of my device. Fig. IV. is a longitudinal section through the gate of my device, its shaft, and an operating means upon said shaft. Fig. V is a front elevation of my device showing a battery of washers.

In the accompanying drawings:—1 designates the jig of the washer having an impurities outlet 2 that is controlled by a gate 3. The jig is supported and reciprocated vertically in any usual manner, such as by the employment of hangers 4 that are actuated by eccentrics 5 upon eccentric shafts 6. The jig operating means and the means for controlling the impurities outlet 3 of the jig may be that illustrated in the drawings, for which no invention is herein claimed, or any other suitable mechanism.

7 designates the washing tank of the washer in which the jig 1 operates and which is provided with a converging hopper

bottom 8. At the bottom of the washing tank is an outlet 9.

10 designates a gate housing of a discharge valve suitably supported at the bottom of the washing tank and which has an inlet in communication with the outlet 9 of said tank, (as seen in Fig. I.) and is provided with an escape opening 11 at the bottom. 12 is a chute located beneath the escape opening of the gate housing and into which the material that passes through said gate housing may descend to be delivered into a conveyer 13 that may be of any preferred construction.

The body of the gate housing 10 is of approximately cylindrical shape in cross section and within said gate housing is a closely fitting chambered controller or segmental gate 14, (see Figs. I and IV,) that is adapted to be rotated in the gate housing by means to be next described. 15 is a gate shaft that extends longitudinally in the gate housing and to which the heads of the segmental gate 14 are fixed. This shaft is horizontally arranged and has fixed to it, exteriorly of the gate housing, a ratchet wheel 16. 17 are rocker arms loosely fitted to the shaft 15 on opposite sides of and adjacent to the ratchet wheel thereon and in the outer ends of which is mounted a rod 18. 19 is a pawl loosely fitted to the rod 18 and adapted to engage the teeth of the ratchet wheel 16, (as seen in Fig. III.) 20 is a reciprocating operating rod having a fork at its inner end that embraces the pawl 19 and is pivoted to the rod 18 of the rocker arms 17, and through the medium of which said rocker arms are moved backwardly and forwardly to cause the pawl 19 to impart rotation to the ratchet wheel 16, the shaft 15 on which it is fixedly mounted, and the segmental gate 14. The operating rod 20 is connected at its outer end to an eccentric strap 22 that surrounds an eccentric 23 upon a driven shaft 24.

It will be seen that upon rotation of the shaft 24 and the eccentric thereon, reciprocatory movement is imparted to the operating rod 20, and as a consequence of said movement of the operating rod, the rocker arms 17 are moved to and fro to perform their office. The driven shaft 24 by which the eccentric 23 is carried is operated by connection to one of the jig operating eccentric shafts 6, the means employed for this connection being preferably a sprocket chain

25 that operates upon a lower sprocket wheel
26 on the shaft 24, and an upper sprocket
wheel 27 upon a jig operating eccentric shaft.

In the practical use of a washer having
5 my improvement incorporated therein, the
jig of the washer is operated in the usual
manner with the result of causing the heavy
matters that are discharged from the jig to
escape therefrom and to descend into the
10 washing tank. These heavy matters fall in
the washing tank to the outlet 9 in which
they accumulate to be discharged by opening
the segmental gate 14. During the operation
of the jig, the segmental gate 14 is
15 gradually rotated due to the actuation of
the mechanism provided for such rotation,
and the opening or chamber in the segmental
gate is at intervals brought into registra-
tion with the inlet to the gate housing 10
20 which is in constant communication with
the outlet 9, so that the matter accumulated
at such outlet may enter through said inlet
into the segmental gate. The continued
movement of the segmental gate causes its
25 opening or chamber to be moved away from
the inlet and carried to the escape opening
11 of the gate housing for communication
therewith, with the result that the matter
gathered in the segmental gate is discharged
30 therefrom and permitted to descend into the
conveyer and be removed from the washer.
The segmental gate 14 is snugly fitted in the
gate housing 10 and as a consequence there
is slight opportunity for the escape of water
35 through said gate housing from the water
tank, the only material discharge of water
through the gate housing being that incident
to the filling of the segmental gate, and
its loss of water may be compensated for by
40 the consequent delivery of a small amount
of water into the washing tank through a
supply pipe, (as seen at 28 Fig. I.)

29 designates a shield loosely mounted
upon the shaft 15 and which extends across
45 the ratchet wheel 16. This shield is adapted
to be moved toward the point of the pawl
19 by suitable means, such as an arm 30
fixed to the shield and having connected to
it an operating rod 31. When the shield
50 is moved toward the point of the pawl, its
portion extending across the ratchet wheel
acts to restrict the degree to which the pawl
may operate with effective stroke upon the
ratchet wheel and consequently the degree of
55 actuation of the ratchet wheel, the shaft 15,
and the segmental gate 14 in order that the
segmental gate will be rotated more gradu-
ally than otherwise for the discharge of
material from the washing tank through its
60 outlet 9 and the gate housing.

I claim:—

1. The combination of a washing tank
provided with a converging hopper bottom
having an outlet at the bottom, a discharge
65 valve consisting of a gate housing formed

with a cylindrical body having a vertical in-
let at the top registering with the hopper
outlet and also having an escape opening at
the bottom, a gate shaft extending longitu-
dinally through the cylindrical body, and a
segmental gate fixed to the gate shaft and
providing a receiving chamber closely fitting
the cylindrical body and adapted to open
and close the vertical inlet and the escape
opening of the gate housing alternately, a
70 ratchet wheel fixed to the gate shaft, rocker
arms loosely fitted to the gate shaft, on op-
posite sides of and adjacent to the ratchet
wheel, a rod mounted in the inner ends of
the rocker arms, a pawl mounted on the rod
80 between the rocker arms, and a reciprocating
operating rod having a fork pivoted to the
rod of the rocker arms and embracing the
pawl.

2. The combination of a washing tank 85
provided with a converging hopper bottom
having an outlet at the bottom, a discharge
valve consisting of a gate housing formed
with a cylindrical body, having a vertical
inlet at the top registering with the hopper
90 outlet and also having an escape opening at
the bottom, a gate shaft extending longitu-
dinally through the cylindrical body, and a
segmental gate fixed to the gate shaft and
providing a receiving chamber closely fitting
95 the cylindrical body and adapted to open
and close the vertical inlet and the escape
opening of the gate housing alternately, a
ratchet wheel fixed to the gate shaft, rocker
arms loosely fitted to the gate shaft on op-
100 posite sides of and adjacent to the ratchet
wheel, a rod mounted in the outer ends of
the rocker arms, a pawl mounted on the rod
between the rocker arms, a reciprocating
operating rod having a fork pivoted to the
105 rod of the rocker arms and embracing the
pawl, a shield loosely mounted upon the gate
shaft and extending across the ratchet wheel
beneath the pawl and having an arm and
operating rod.

3. The combination of a washing tank 110
provided with a converging hopper bottom
having an outlet at the bottom, a discharge
valve consisting of a gate housing formed
with a cylindrical body having a vertical
115 inlet at the top registering with the hopper
outlet and also having an escape opening at
the bottom, and a gate shaft extending
longitudinally through the cylindrical body,
a segmental gate fixed to the gate shaft and
120 providing a receiving chamber closely fitting
the cylindrical body and adapted to open
and close the vertical inlet and the escape
opening of the gate housing alternately, a
ratchet wheel fixed to the gate shaft, rocker
125 arms loosely fitted to the gate shaft on op-
posite sides of and adjacent to the ratchet
wheel, a rod mounted in the outer ends of
the rocker arms, a pawl mounted on the
rod between the rocker arms, a reciprocating
130

ing operating rod having a fork pivoted to the rod of the rocker arms and embracing the pawl, at its inner end and an eccentric strap at its outer end, a driven shaft having an eccentric surrounded by the eccentric strap, a jig operating eccentric shaft, wheels upon the driven shaft and eccentric shaft and a flexible connection between the wheels.

4. The combination of a washing tank provided with a converging hopper bottom having an outlet at the bottom, a discharge valve consisting of a gate housing formed with a cylindrical body having a vertical inlet at the top registering with the hopper outlet and also having an escape opening at the bottom, a gate shaft extending longitudinally through the cylindrical body, a segmental gate fixed to the gate shaft and providing a receiving chamber closely fitting the cylindrical body and adapted to open and close the vertical inlet and the escape opening of the gate housing alternately, a

ratchet wheel fixed to the gate shaft, rocker arms loosely fitted to the gate shaft on opposite sides of and adjacent to the ratchet wheel, a rod mounted in the outer ends of the rocker arms, a pawl mounted on the rod between the rocker arms, a reciprocating operating rod having a fork pivoted to the rod of the rocker arms and embracing the pawl, at its inner end, and an eccentric strap at its outer end, a driven shaft having an eccentric surrounded by the eccentric strap, a jig operating eccentric shaft, wheels upon the driven shaft and eccentric shaft, a flexible connection between the wheels, and a shield loosely mounted upon the gate shaft and extending across the ratchet wheel beneath the pawl and having an arm and operating rod.

ERNST PROCHASKA.

In the presence of—
HENRY S. BAKER,
H. F. LANG.