

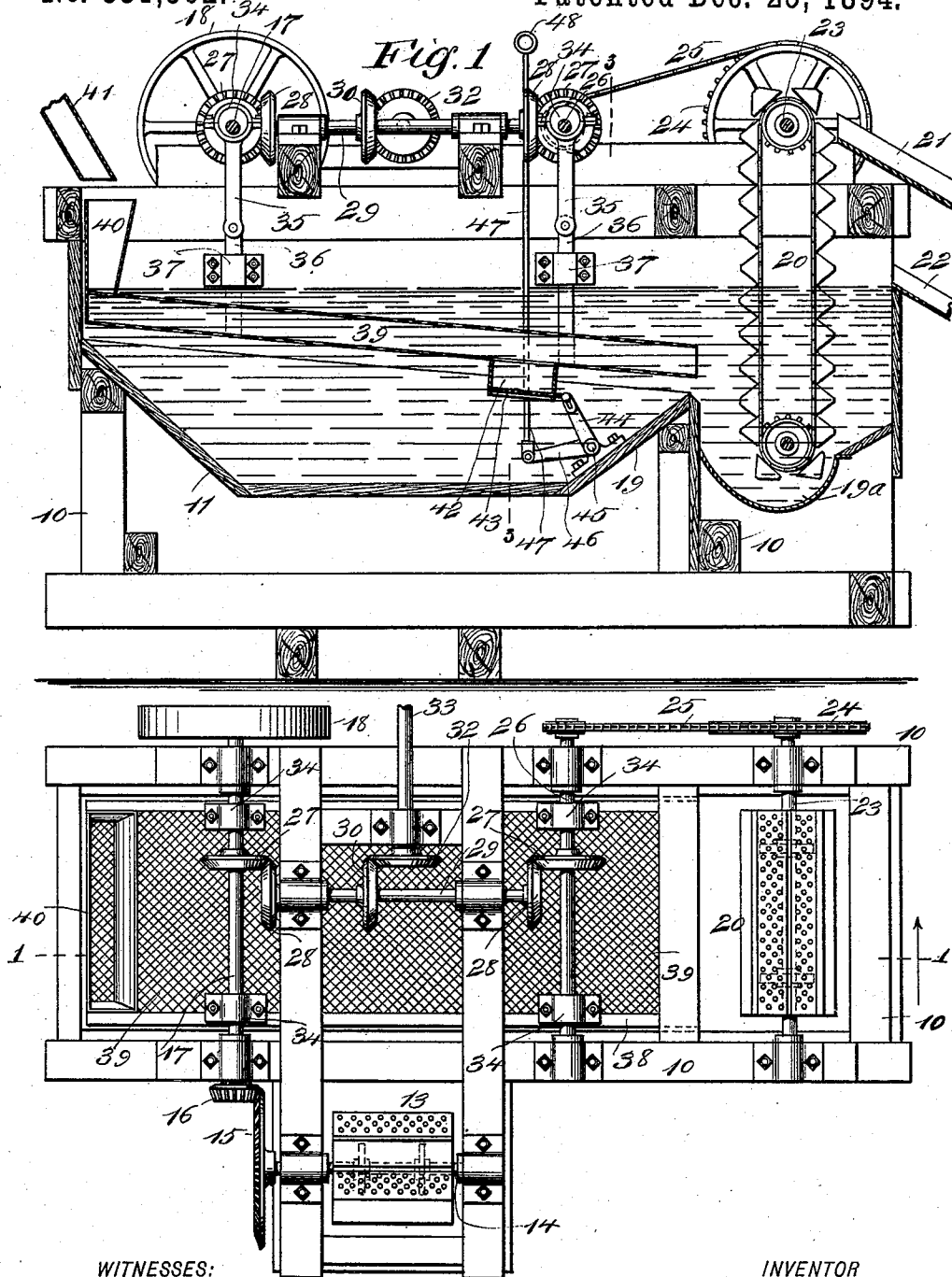
(No Model.)

2 Sheets—Sheet 1.

T. M. RIGHTER.
COAL WASHER AND SEPARATOR.

No. 531,562.

Patented Dec. 25, 1894.



WITNESSES:

John A. Beeson
W. P. Hutchinson

Fig. 2

INVENTOR

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ATTORNEYS.

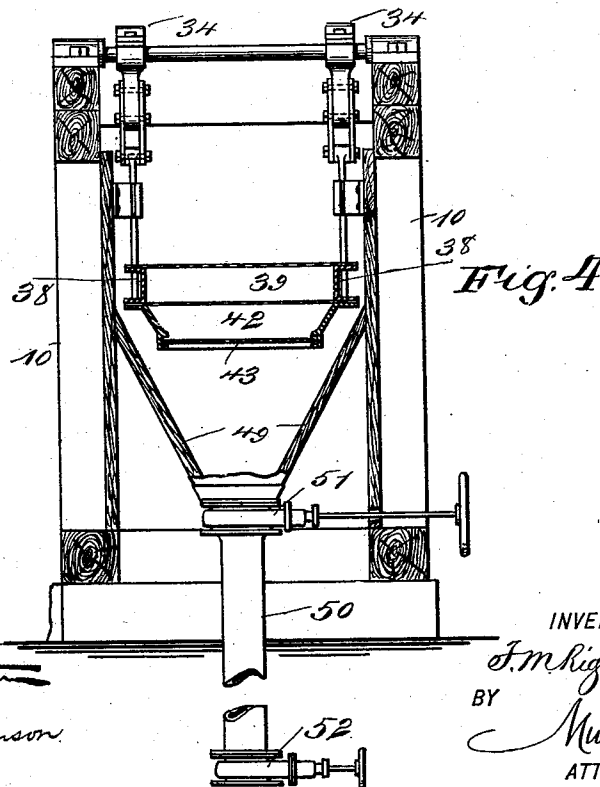
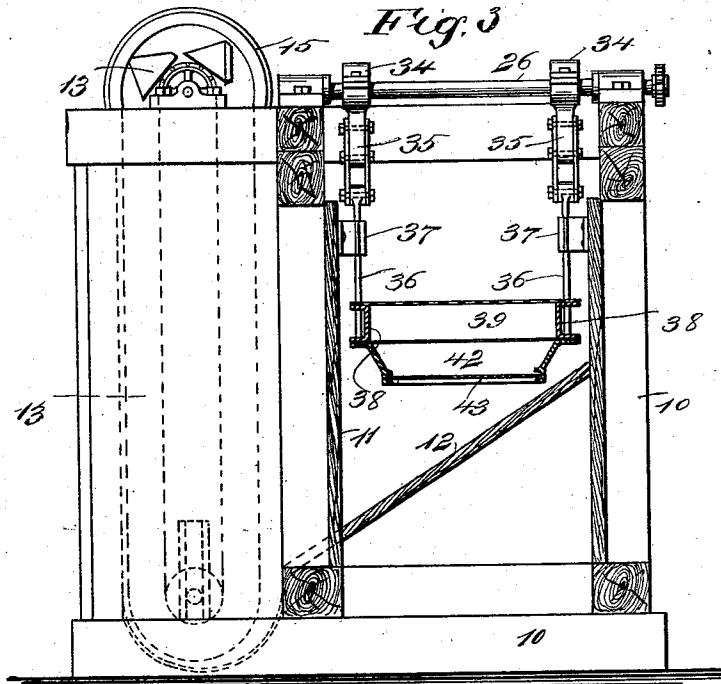
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UNITED STATES PATENT OFFICE.

THOMAS M. RIGHTER, OF MOUNT CARMEL, PENNSYLVANIA.

COAL WASHER AND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 531,562, dated December 25, 1894.

Application filed May 3, 1894. Serial No. 509,929. (No model.)

To all whom it may concern:

Be it known that I, THOMAS M. RIGHTER, of Mount Carmel, in the county of Northumberland and State of Pennsylvania, have invented a new and Improved Coal Washer and Separator, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of devices which are used for washing coal and separating from it the slate, dirt, and other refuse.

The object of my invention is to produce a simple and efficient machine of this character which enables the coal to be very rapidly and thoroughly washed, which entirely separates the slate and other refuse from it, which carries on the entire operation of washing and separating under water, which has a convenient means of discharging the refuse and coal at different points, and which in general is adapted to perform the operation of washing and separating in a very rapid and cheap manner.

To these ends my invention consists of certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a central vertical longitudinal section, on the line 1—1 of Fig. 2, of the machine embodying my invention. Fig. 2 is a plan view of the machine. Fig. 3 is a vertical cross section on the line 3—3 of Fig. 1, and Fig. 4 is a similar cross section, but showing a modified means of cleaning out the washing tub.

The machine is provided with a suitable substantial frame 10, in which is mounted a tub 11 which is preferably constructed so as to incline to one side, as shown at 12 in Fig. 3, and the inclined bottom delivers into an elevator 13 which is of common construction and is arranged vertically in the machine so as to raise and discharge the slate and other refuse sliding into it from the tub bottom. The elevator may be driven in any suitable manner, but as illustrated, its top shaft is

connected by gear wheels 15 and 16 with a transverse shaft 17 on the top of the frame 10, which shaft is provided with a fly wheel 18 and this, if desired, may be used as a pulley, although as illustrated the shaft is driven by other means.

The tub 11 is inclined upward near the rear end, as shown at 19 in Fig. 1, and is then provided with a pocket 19^a in which is placed a second vertical elevator 20 similar to the elevator 13, both being provided with lifting buckets which are perforated to permit water to run from them, and the elevator 20 discharges coal, which has been washed, into a chute 21. See Fig. 1. Below the chute 21 is a spout 22 through which the dirty water from the tub runs, and the tub may be supplied with water in any convenient manner.

The upper shaft 23 of the elevator 20 is arranged transversely on the top of the frame 10 and, as illustrated, is driven by a sprocket wheel 24 which connects by a belt 25 with a sprocket wheel on the shaft 26, which is parallel with the shaft 17, and the shaft 26 connects by gears 27 and 28 with a longitudinal shaft 29 on the machine frame, which shaft connects also with the shaft 17 by gear wheels 27 and 28, similar to those just described. The shaft 29 is connected also by gear wheels 30 and 32 with a driving shaft 33 which serves to drive the machine and, while the arrangement of shafts described is a convenient one, it will be understood that the shafts 17 and 26 as well as the elevator shafts may be driven in any other convenient manner.

The shafts 17 and 26 are provided with eccentrics 34, see Fig. 1, from which extend depending connecting rods 35 which connect with the slide rods 36 held to move in slide-ways 37 on the sides of the tub, and these rods 37 connect with the frame 38 of the screen chute 39, this structure comprising a supporting side frame, as best shown in Fig. 3, and a screen top and bottom, as shown in the same figure. The chute is held at an inclination and extends nearly the length of the tub, its lower end discharging into the pocket 19^a. Its upper end is provided with a hopper 40 into which the unwashed and unseparated coal is delivered from a feed chute 41. It will be

seen that the eccentrics, when the shafts are in motion, will keep the screen chute shaking, and if desired the eccentrics may be given unequal throw so that the material in the chute may be more thoroughly agitated.

Near the lower end of the chute and on the under side thereof is an open topped pocket 42, which has a slide bottom 43, this being connected with a crank 44 which is fulcrumed, as shown at 45, in the tub and has connection with another crank arm 46 to which is pivoted the rod 47, this extending upward above the machine where it terminates in a handle 48, by lifting which the rod and cranks are actuated and the slide 43 pulled open so as to permit the material in the pocket 42 to drop out into the tub.

The coal is fed into the hopper 40 together with the slate and dirt, which are mixed with it, and the motion of the screen chute 39, together with the inclination of the chute, causes the coal and coarser particles of slate to tumble toward the lower end of the screen, while the fine matter drops through the screen. The coal and slate drop into the pocket 42 and the coal, being lighter, rolls out and is finally tumbled into the pocket 19^a while the slate being heavier is retained in the pocket 42. The rod 47 is occasionally lifted so as to permit the accumulated slate to drop out into the tub. The slate and mud slide to one side and are discharged by the elevator 13, while the coal is received and discharged by the elevator 20 and thus the operation is carried on constantly and a large quantity of coal may be washed and thoroughly separated from the slate.

Instead of providing the tub with the single inclined bottom 12, as shown in Fig. 3, it may be provided with a hopper-like bottom 49 from which leads a discharge pipe 50 which is provided with valves 51 and 52, see Fig. 4, and, by opening these valves the dirty water, slate, &c., may be drawn off.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

1. A washer and separator comprising the tank having two compartments in its bottom, endless elevators for removing the contents of said compartments, transverse shafts 17, 26 geared together and to elevator shafts, and provided with eccentrics, pitmen depending from said eccentrics, a tubular screen rectangular in cross section perforated at top and bottom and operatively connected with the pitmen, the lower open end of the screen discharging into one of said compartments and its upper end having an inlet hopper, secured thereto and discharging into the interior of the screen and a pocket opening upwardly into the bottom of the screen between the ends thereof and discharging into the other compartment, a valve closing the bottom of the compartment and a lever mechanism wholly exterior to the tubular screen and connected with said valve and having an operating rod or handle extending to the upper edge of the tank, and a drive shaft, substantially as described.

2. A coal washer and separator comprising the water tank having two compartments in its bottom, an inclined tubular screen rectangular in cross section, perforated at top and bottom and extending at its lower open end over one of said compartments, a feed hopper carried by the upper end of the screen and discharging into its interior, a slate pocket extending transversely across the lower side of the screen and opening at its upper end into the interior of the screen, a valve in the bottom of the slate pocket for discharging its contents into the other compartment, mechanism for operating the valve, and an operating mechanism suspending the screen below the water level and imparting an up and down motion to it, substantially as described.

THOMAS M. RIGHTER.

Witnesses:

RALPH W. MONTELIUS,
FREDERICK W. MAGRADY.