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R. L. MARTIN, JR. & H. CORY.

COAL WASHING APPARATUS.

APPLICATION FILED OCT. 5, 1905.

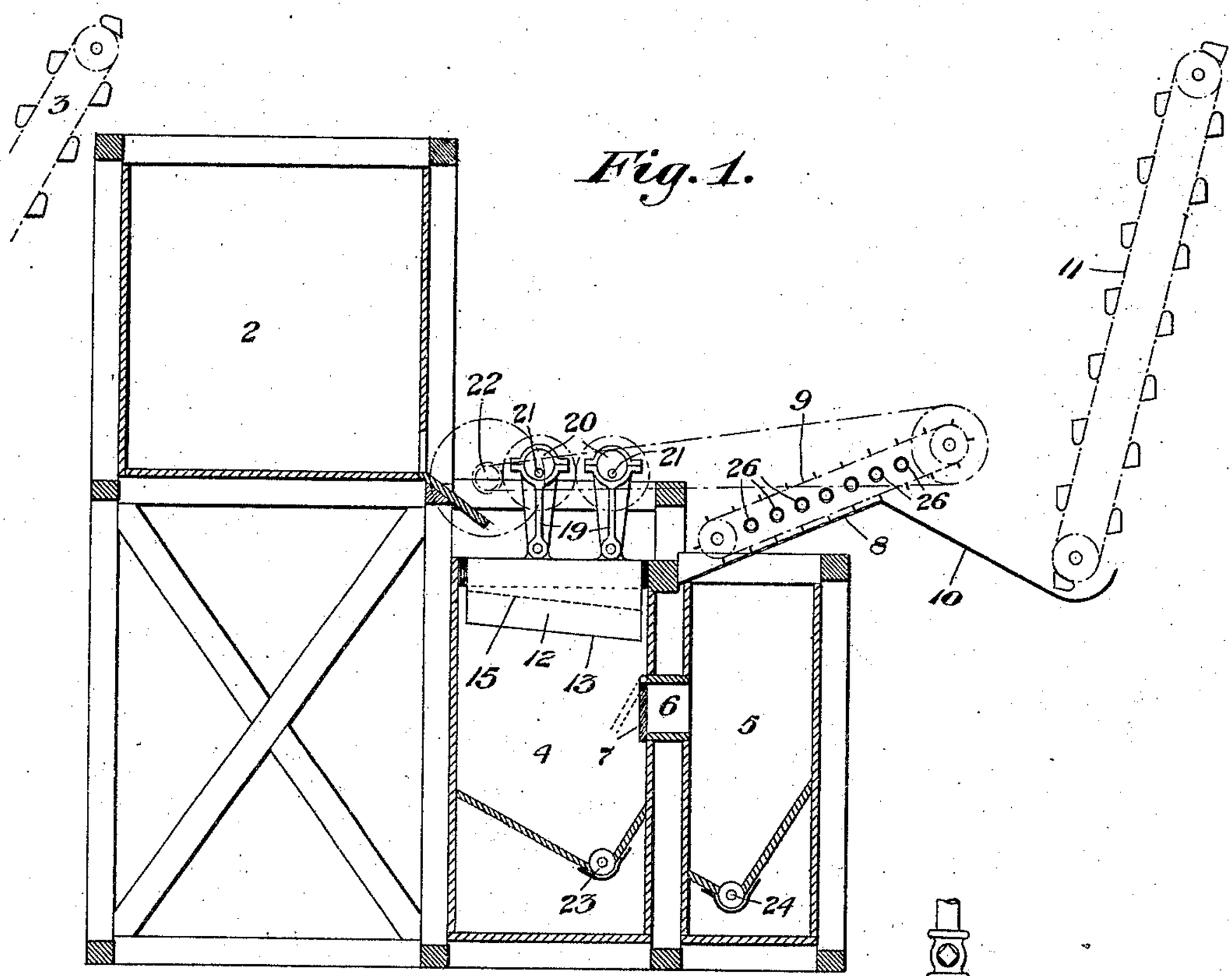

Fig. 1.

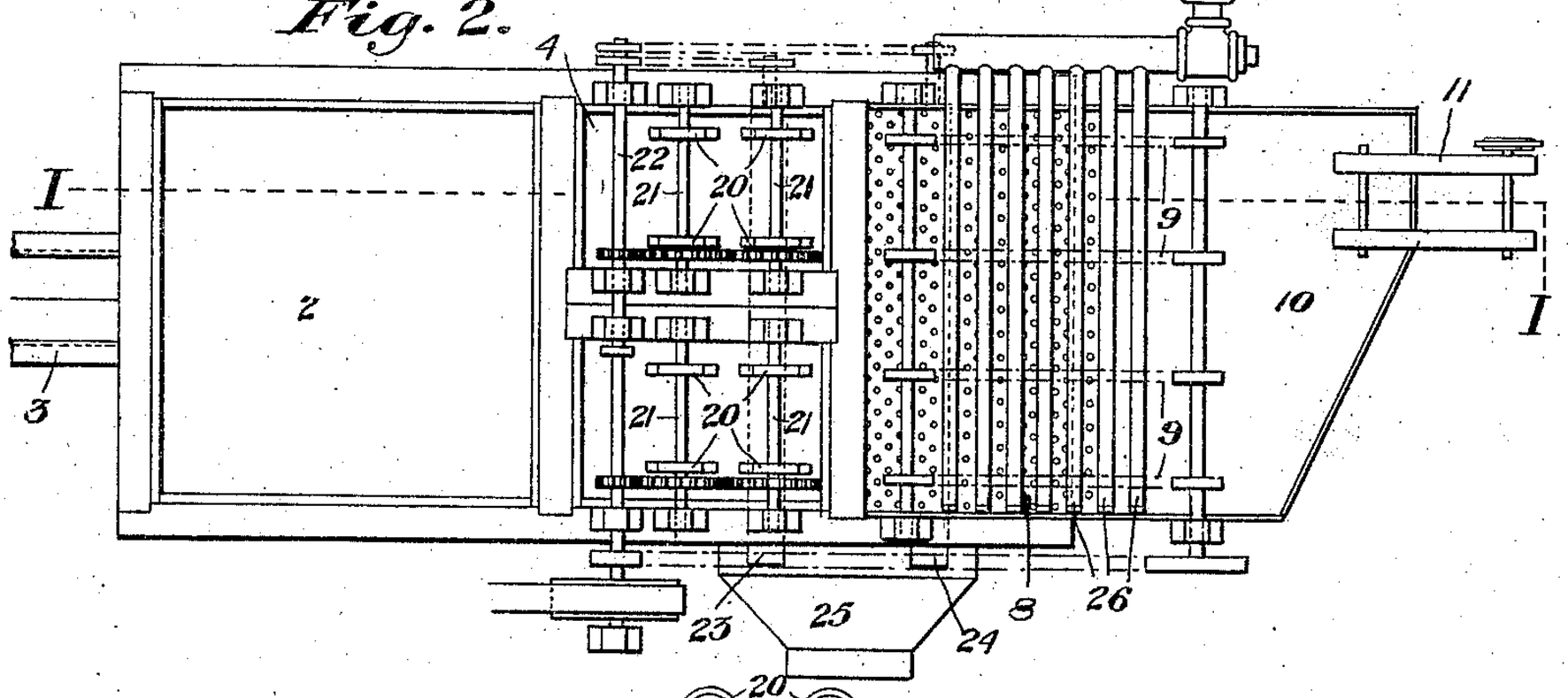

Fig. 2.

Fig. 3.

Witnesses:
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UNITED STATES PATENT OFFICE.

ROBERT L. MARTIN, JR., AND HARVEY CORY, OF PITTSBURG, PENNSYLVANIA, ASSIGNORS TO PITTSBURGH COAL WASHER COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

COAL-WASHING APPARATUS.

No. 850,594. Specification of Letters Patent. Patented April 16, 1907.

Application filed October 5, 1905. Serial No. 281,374.

To all whom it may concern:

Be it known that we, ROBERT L. MARTIN, Jr., and HARVEY CORY, citizens of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Coal-Washing Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings, forming part of the specification, in which—

Figure 1 is a longitudinal vertical sectional view through our improved coal-washing apparatus, indicated by the line I I of Fig. 2. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a detail view of the reciprocating suction-jig.

Our invention refers to improvements in coal-washing apparatus and is designed to provide a compact economical plant wherein the coal or other minerals to be washed may be operated upon by a circulating body of water, the circulation being provided by the operation of a reciprocating valved-bottom jig, together with means for draining the washed coal, recovering the water therefrom, conveying the coal, &c., as shall be more fully hereinafter described.

Referring now to the drawings, 2 is the coal-bin, to which coal is conveyed by elevator 3 from a crusher located at any suitable position, it being understood that the best results are secured by previously crushing or reducing the coal to small particles. Adjacent to the coal-bin 2 is a jig-tank 4, beyond which and adjacent thereto is located the drain-tank 5, said tanks being connected by an intervening passage-way or port 6, leading from the drain-tank into the jig-tank and provided with a hinged valve-door 7. The object of this arrangement and construction is to permit the water from the drain-tank to flow into the jig-tank upon upward movement of the jig, but to prevent its return flow, whereby the water in the jig-tank will remain *in statu quo*, so that upon downward travel of the jig it will be forced through such water, the effect of which will be to buoy up the contained coal, producing separation of the heavier impurities therefrom and floating the washed coal over from the jig into the receiving-screen. Said screen 8 is located above the drain-tank, inclining upwardly away therefrom, and serves as a drain-floor to receive the washed coal, being provided with a series of minute perforations, as clearly shown in Fig. 2, whereby the excess water will drain away into the drain-tank.

The washed coal delivered upon screen 8 is conveyed away therefrom by means of conveying-chains 9, provided with suitable drag extensions, driven in any convenient manner, whereby the coal is carried upwardly to the top of the screen 8 and is delivered therefrom by gravity to an inclined chute 10, leading to an elevator-boot, from whence the washed coal is carried away to any suitable point of discharge by means of an elevator 11.

Vertically mounted in the jig-tank 4 is the reciprocating jig, (shown in detail in Fig. 3,) consisting of a rectangular framework 12, fitting in the interior of the jig-tank with suitable intervening guide-plates adapted to provide a practically water-tight bearing. Across the lower portion of the jig is an inclined floor 13, of plate metal or other suitable material, provided with a series of upwardly-opening valves 14, adapted to admit water upwardly upon downward motion of the jig, but to close upon upward movement thereof, preventing return circulation of the water. Somewhat higher above the valve-bottom 13 is a similarly-inclined plate 15, of perforated metal or woven wire, adapted to support the body of coal to be washed. At the lower end of such inclined plates 13 and 15 are opening and closing valves 16 17, connected with levers 18, by which they are operated, the purpose of said valves being to allow the sludge, sulfur, slate, and other impurities to be drawn off from time to time and to be delivered into the bottom of the jig-tank. The jig is reciprocated or oscillated vertically by means of pitmen 19, connected with cams or eccentrics 20, mounted on shafts 21, said shafts being driven by suitable gearing from a main shaft 22, as indicated in Fig. 2. Such specific mechanism for actuating the jig is not, however, essential, and any means which will impart suitable reciprocations to it will give the desired results.

23 24 are screw conveyers located in the bottom of the jig-tank and drain-tank, respectively, adapted to convey the sludge, slate, sulfur, and any small coal remaining therein outwardly away from said tanks and to deliver it into a hopper 25, leading to the

boot of the sludge-elevator, of any suitable construction, located outside of the tank, by which the said material may be carried away to any point of discharge. For the purpose of washing off the sulfur or any adhering foreign matter before finally removing the coal I employ a series of sprinkler-pipes 26, located above the conveying-drags, as shown, provided with a supply pipe, valve, &c., under the control of the operator and capable of washing all such impurities downwardly into the drain-tank.

The operation of the apparatus will be readily understood from the foregoing description. The entire plant is simple in construction and continuous in operation. It is very economical of water, results in very thorough washing of the coal, and has given excellent results in practice.

Various changes and modifications may be made in the design, proportions, or various details of the construction without departing from our invention, but all such are to be considered as within the scope of the following claims.

What we claim is—

1. In a coal-washing apparatus, the combination of a coal-bin, an adjacent tank adapted to contain water, a jig fitting snugly therein and provided with means for sustaining the contents and for permitting an upward flow of water on downward movement of the jig and for preventing downward flow on upward movement of the jig, means for reciprocating said jig in said tank, a screen arranged adjacent to and adapted to receive the overflow contents from the jig, a separate drain-tank beneath said screen, a suction-valve permitting the flow of water from said drain-tank to the jig-tank, and means for removing the coal from said screen, substantially as set forth.

2. In a coal-washing apparatus, the combination of a tank adapted to contain water, a jig fitting snugly in said tank and provided with means for sustaining the contents and for permitting an upward flow of water on downward movement of the jig and for preventing downward flow on upward movement of the jig, means for reciprocating said jig in said tank, a screen arranged adjacent to and adapted to receive the overflow contents from the jig, a separate drain-tank beneath said screen, and a valve-controlled passage permitting a flow of water from said drain-tank to the jig-tank, substantially as set forth.

3. In a coal-washing apparatus, the combination of a tank adapted to contain water, a jig fitting snugly in said tank and provided with means for sustaining the contents and for permitting an upward flow of water on downward movement of the jig and for preventing downward flow on upward movement of the jig, means for reciprocating said jig in said tank, means for receiving the washed coal from the jig, a tank arranged to receive the overflow water from the jig-tank, and a valve-controlled passage therefrom to the jig-tank, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

ROBERT L. MARTIN, Jr.
HARVEY CORY.

Witnesses:
C. M. Clarke,
Chas. S. Lepley.