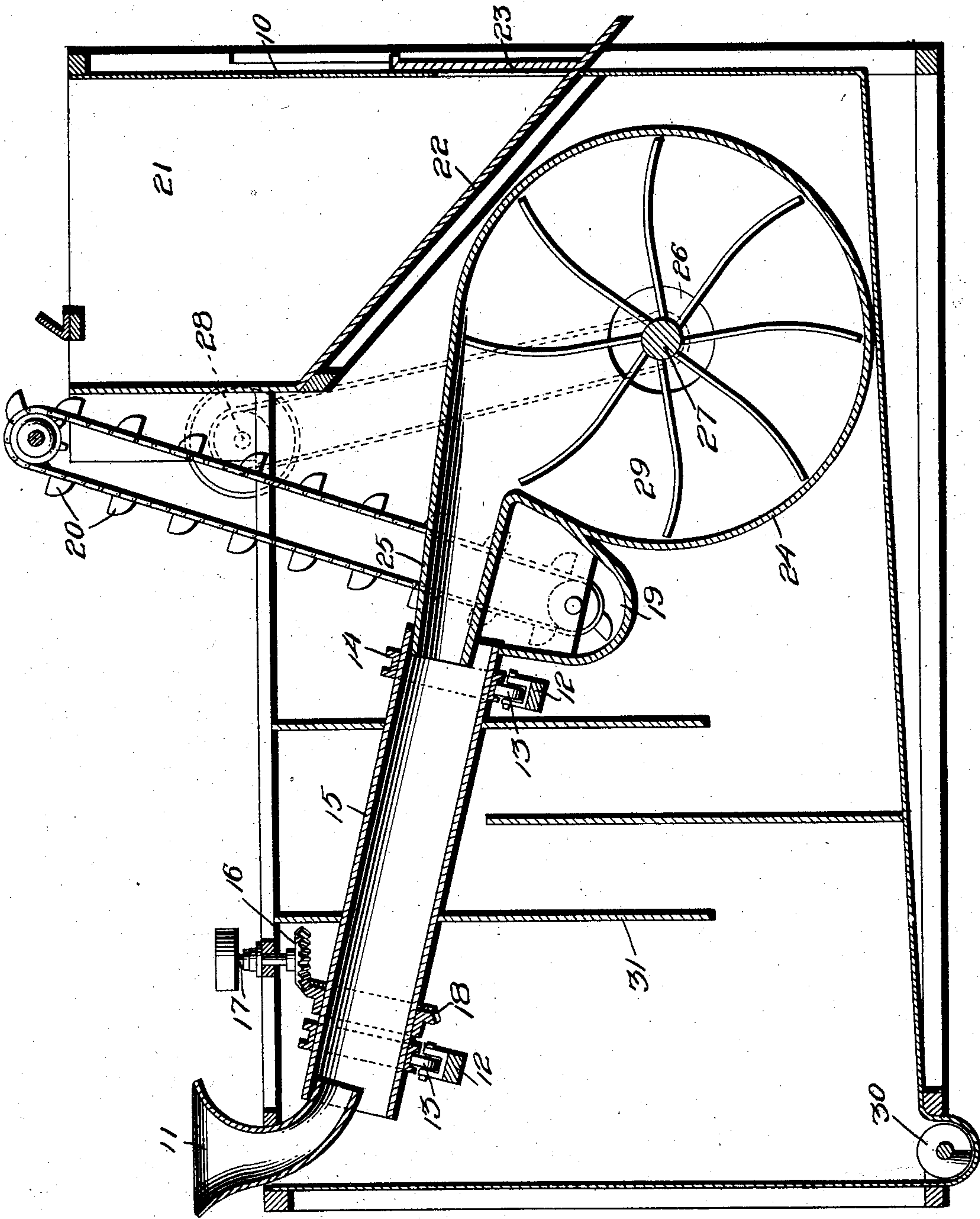


No. 721,103.

PATENTED FEB. 17, 1903.

N. A. SMITH.
ORE OR COAL WASHER.
APPLICATION FILED MAY 27, 1902.

NO MODEL.



Witnesses
E. J. Hewab
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UNITED STATES PATENT OFFICE.

NEWTON A. SMITH, OF JOHNSTON CITY, ILLINOIS, ASSIGNOR OF ONE-HALF
TO BENJAMIN PERRINE, OF LAKECREEK, ILLINOIS.

ORE OR COAL WASHER.

SPECIFICATION forming part of Letters Patent No. 721,103, dated February 17, 1903.

Application filed May 27, 1902. Serial No. 109,219. (No model.)

To all whom it may concern:

Be it known that I, NEWTON A. SMITH, a citizen of the United States, residing at Johnston City, in the county of Williamson and State of Illinois, have invented a new and useful Ore or Coal Washer, of which the following is a specification.

This invention relates to certain improvements in devices for washing ore or coal to separate dirt and fine material from the larger particles or to separate particles of different specific gravity, and has for its principal object to provide a device in which the body of material to be washed is caused to travel through and against a body of water moving in an opposite direction, the velocity and volume of the water being in proportion to the size and specific gravity of the material to be treated.

A further object of the invention is to provide a mechanism of this class in which the same water may be used continuously for the purpose of washing a large quantity of ore or coal, this being especially valuable in the separation of fine particles of gold from the large boulders and rocks in placer-mining, where there is usually a scarcity of water.

A still further object of the invention is to provide for the separation of the dirt and other material from the water in order to prevent the return thereof, with the water, to the pumping or other device employed in connection with the apparatus.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawing, and particularly pointed out in the appended claims.

The accompanying drawing represents in sectional elevation an ore and coal washing apparatus constructed in accordance with my invention.

The tank or casing 10 is of a size and shape depending on the character and quantity of material to be handled and is provided at one end with a hopper 11, into which the coal or ore to be treated is delivered. In the tank are a pair of supports 12, having rollers 13 adapted to annular grooves formed in collars 14 on the periphery of an inclined cylinder

15, said cylinder being opened at both ends and its upper end being in communication with the discharge end of the hopper 11. The cylinder is revolved in any suitable manner, in the present instance by a beveled gear 16, mounted on a power-shaft 17 and intermeshing with a bevel-gear 18 on the drum. The coal or ore is deposited in the upper end of the cylinder and as the latter is turned travels by gravity toward the lower end of said cylinder and is discharged into a receiving-compartment 19, from which it is constantly removed by an endless-chain conveyer 20 and deposited in a suitable storage-bin 21, arranged partly above the tank, said bin being preferably provided with an inclined bottom 22 and a discharge-opening which may be closed by a suitable door 23. In one end of the tank, at a point below the water-line, is a cylindrical pump-casing 24, having a discharge-pipe 25 leading into the lower end of the cylinder, the diameter of the pipe being less than the internal diameter of the cylinder, so as to leave a space below the pipe for the coal or ore to pass to the receptacle 19. The sides of the pump-casing are provided with openings 26 in order to place said casing in communication with the water in the tank and to permit the passage of the transversely-disposed pump-shaft 27, which receives power from a driving-shaft 28 through intervening belt-wheels or other power-transmitting devices. To the shaft are secured a number of slightly-curved blades 29, by which the water is forced through the tube 25 and from thence up through the cylinder 15 in a direction opposite the direction of travel of the ore or coal, the lighter material being caught by the water and carried up to the upper end of the cylinder and discharged into the tank, while the heavier particles travel by gravity to the lower end of the cylinder and fall into the receptacle 19. The upward flow of water in the cylinder impedes the travel of the coal or ore therethrough, so that all dirt or other fine material is removed, and the constant revolution of the cylinder brings the particles of ore or coal into contact with each other, dislodging any dust or other material which may be clinging thereto. The comparatively slow feed of the material is

of considerable advantage in the treatment of placer deposits where the fine gold is embedded in gangue, which will not yield to ordinary washing. In many localities where placer deposits occur there is also a scarcity of water, necessitating the building of expensive chutes or pipe-lines for conveying water from a source of supply. The bottom of the tank is inclined toward the hopper end, at which point a screw or other conveyer 30 may be placed to remove the dirt and other fine material either continuously or at intervals, and in order to prevent such dirt from being carried back to the pump by the returning current of water I employ baffle-plates 31, which compel the water to travel in a tortuous course and permit the dirt to settle to the bottom of the tank.

While the construction herein described and illustrated in the accompanying drawing is the preferred form of the device, it is obvious that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described the invention, what I claim is—

1. The combination of the water-containing tank, a pump disposed in said tank and adapted to maintain a continuous circulation of water therein, an inclined cylinder adapted to receive the material to be washed at one end and to discharge the same at the opposite end, a pump discharge-pipe leading into the lower end of the cylinder, and baffle-plates arranged in the tank at points between the opposite ends of the cylinder.

2. The combination of the water-containing tank, an inclined cylinder, means for revolving the cylinder, a pump having a discharge-pipe leading into the lower end of the cylinder and adapted to force a body of water therethrough in a direction opposite to the direction of movement of the material being treated, said pump being in free com-

munication with the tank and maintaining a continuous circulation of water therein, and baffle-plates arranged within the tank at points between the opposite ends of the cylinder.

3. The combination of the water-containing tank, an inclined cylinder disposed within the tank and open at both its upper and lower ends, a feed-hopper leading to the upper portion of the cylinder, a receiving-compartment at the discharge end of the cylinder, means for revolving the cylinder to assist in the movement of the material therethrough, and a pump adapted to maintain the circulation of water in the tank and having a discharge-outlet leading into the lower end of the cylinder and adapted to force a current of water through the cylinder in a direction opposite to the direction of movement of the material being treated, to thereby discharge the waste material from the entrance end of the cylinder.

4. The combination of the water-containing tank having an inclined bottom, baffle-plates arranged in said tank, an inclined cylinder extending across the baffle-plates, means for feeding the material to be treated into and through the cylinder, means for revolving said cylinder, a pump-casing situated within the tank and in free communication with the water-space of said tank, a discharge-tube leading from the pump-casing to the lower end of the cylinder, revolving pump-blades disposed in said cylinder, a receiving-compartment arranged below the discharge end of the cylinder, a storage-bin, and an endless-chain conveyer for removing the material from the receiving-compartment and discharging the same into said storage-bin.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

NEWTON A. SMITH.

Witnesses:

HENRY GLIDEWELL,
J. M. TALLIS.