





# UNITED STATES PATENT OFFICE.

JOHN H. DAVIS, OF GLENS FALLS, NEW YORK, ASSIGNOR TO UNITED STATES GRAPHITE COMPANY, OF SAME PLACE.

## GRAPHITE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 679,473, dated July 30, 1901.

Application filed September 14, 1900. Serial No. 30,037. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. DAVIS, a citizen of the United States, residing at Glens Falls, in the county of Warren and State of New York, have made a new and useful Invention in Graphite-Separators, of which the following is a specification.

My invention is directed particularly to an improvement in that type of graphite-separators in which the separation of the graphite proper from the tailings or waste is effected through the agency of water by allowing the ground or crushed material to settle upon the surface of a body of water in such manner that the graphite passes off with the water in one direction, while the tailings or waste pass downward by the action of gravity; and it has for its object to provide a separator of this type which is practically continuous in its operation and in such manner that it will not be necessary to clean or otherwise disturb it at any time after it is once put in operation, thus making it possible to run it for an indefinite length of time with a minimum amount of attention.

The invention will be fully understood by referring to the accompanying drawings, in which—

Figure 1 is a perspective view of the entire machine; and Fig. 2 is a longitudinal sectional view taken therethrough on the line 3 3, Fig. 3, and as seen looking thereat from left to right in the direction of the arrows. Fig. 3 is a side elevational view as seen looking at Fig. 2 from the right to the left hand side of the drawings.

Referring now to the drawings in detail for a full and clear understanding of the invention, such as will enable others skilled in the art to construct and use the same, A represents the body of the machine, of trough-like construction, having a downwardly-extending chamber B, to the bottom of which is secured one or more tailings-conveying pipes P and nozzles N, S being a graphite-conveying spout at the extreme right-hand end of the machine and E an upwardly-extending partition, upon which rests one end of a horizontally-disposed partition or plate C, secured to the inner sides and extreme right-

hand end of the machine, said plate C being provided with a large number of perforations or holes H H. It is the function of this perforated partition or plate to act as a means for preventing, in so far as possible, any suction effect upon the floating graphite on the surface of the water by that portion of the water which passes out through the downwardly-extending chamber B, tailings-conveying pipe or pipes P, and nozzle or nozzles N.

F is a ledge or inward extension of the plate C over the partition E, and J is a similar ledge or inward extension over the extreme right-hand end of the plate C, said extensions constituting, in effect, means for preventing undue currents or eddies as the water flows through the machine.

D D are riffles located crosswise on the plate C and also producing a similar effect as is produced by the extensions F and J.

I is an inlet-pipe for allowing the water to flow into the machine, said inlet-pipe being connected at its inner end to a cylinder I', which is provided with an indefinite number of fine perforations H', the function of which is to aid in the equal distribution of the water without establishing undue currents or eddies in the machine.

The operation is as follows: The machine is filled with water by a continuously-flowing stream thereof through the pipe I and perforated cylinder H', the flow thereof being such as to provide a continuous surface flow of a definite depth in the direction of the arrows over the extension J and through the graphite-conveying spout S, and also a continuous flow through the tailings-conveying pipe or pipes P and nozzle or nozzles N. The crushed or ground material is now supplied by a sieve or any other distributing means over the entire surface of the plate C, and by reason of the fact that the graphite is of lighter specific gravity than water it will float gently away, passing outward in the direction of the arrows through the spout S, while the tailings being of greater specific gravity than the water will pass downward through the numerous openings or holes H and thence outward through the tailings-conveying pipe or pipes P and nozzle or nozzles N. It will be appar-



ent that by reason of the peculiar perforated construction of the cylinder I' the admission of water into the machine after it is once filled to its working capacity will be of a very gentle nature and that little or no disturbing currents or eddies will be produced, also that any tendency to the production of such currents or eddies will be further prevented by the extension F over the partition E. The extension J prevents any possibility of any of the tailings being carried outward by the discharge-current through the spout S, and the riffles D D also prevent currents or eddies and tend to cause the tailings to pass downward, while the horizontally-disposed perforated partition or plate C prevents the out-flowing water which conveys the tailings to the exterior of the machine from acting upon the floating graphite carried upon the surface of the water.

Such a machine I am enabled to operate continuously and with it to effect the most perfect separation of graphite from its tailings and without the necessity of stoppage thereof at any time for cleaning or repairing, and by reason of the freedom from currents and eddies in the machine there will be no tendency to the sinking of any of the graphite or to the movement of tailings in the direction of the graphite-conveying spout.

I am aware that it is not broadly new with me to separate graphite from its tailings by the action of water, and I make no claim hereinafter broad enough to include such a structure. I believe, however, that it is broadly new with me to devise a graphite-separator dependent upon the action of water, in which the currents or eddies are avoided and by which the most perfect separation is effected without requiring more than a minimum amount of attention, and my claims are generic as to this feature.

I do not limit the use of my invention to the separation of graphite from its tailings, as it obviously may be used in any place where powdered material is composed of two elements, one of which is lighter and the other heavier than the water, and my claims are designed to include all such uses.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A water graphite-separator of trough-like construction provided with means at one end and near the bottom of the trough for admitting water thereto, and means at the other end for conveying away a portion of the water and the graphite floating thereon; in combination with tailings-conveying pipe or pipes located beneath the trough-like structure and intermediate the ends thereof together with a horizontally-disposed perforated partition located above the tailings-conveying means, the arrangement being such that the entire supply of water is admitted at one end of the machine, while one portion passes out at the other end thereof carrying with it the sepa-

rated graphite, the remaining portion of the water passing downward and carrying with it the tailings, substantially as described.

2. A water graphite-separator of trough-like construction provided with means located at the bottom and near one end thereof for admitting the water thereto; a graphite-conveying spout located at the other end for conveying away the separated graphite; tailings-conveying means located beneath and intermediate the ends of the machine for conveying away the tailings and the remaining portion of the water; together with a horizontally-disposed perforated partition and crosswise riffles sustained thereby for preventing, in so far as possible, any disturbing suction effect upon the floating graphite as the water passes through the machine, substantially as described.

3. A water graphite-separator of trough-like construction provided with means near the bottom of the trough for admitting water to the interior thereof; a conveying-spout for carrying a portion of the water and the graphite floating thereon in one direction and one or more tailings-conveying pipes for conveying another portion of the water and the tailings in a different direction by the action of gravity; in combination with a horizontally-disposed perforated partition located above the tailings-conveying means, substantially as described.

4. A water graphite-separator of trough-like construction provided with means near the bottom of the trough for distributing the inflowing water to the machine; in combination with means for conveying the water and the graphite on the surface thereof in one direction and additional means for conveying the tailings in a different direction by the action of gravity and a part of the water; together with a horizontally-disposed perforated partition located above the tailings-conveying means, substantially as described.

5. A water graphite-separator provided with an inlet-pipe and a perforated cylinder for effecting the gentle admission of the water into the machine; a horizontally-disposed perforated plate having riffles secured to its upper surface; in combination with inward extensions for preventing disturbing currents or eddies; a graphite-conveying spout for conveying the graphite in one direction and a waste-pipe for conveying the tailings in a different direction, substantially as described.

6. A graphite-separator of trough-like construction, having a depression at one end, means for admitting water to said depression, located at the bottom thereof, a screen on a higher level and a discharge-spout on a still higher level, forming a stepped construction, said separator being provided with a tailings-discharge outlet beneath said screen, substantially as described.

7. A graphite-separator of trough-like construction divided into three levels, forming steps of increasing height from the inlet to



the discharge, means for admitting water at the bottom of the lowest level, a screen covering the second level, said separator being contracted and provided with a discharge-  
5 pipe below said screen, and a discharge spout or chute for the separated graphite on the highest level, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN H. DAVIS.

Witnesses:

JOHN LAVERY,

DANIEL S. CHINTEN.