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PATENTED DEC. 18, 1906.

R. H. POSTLETHWAITE.
SEPARATING CYLINDER FOR GOLD DREDGERS.

APPLICATION FILED MAY 15, 1905.

Fig. 1.

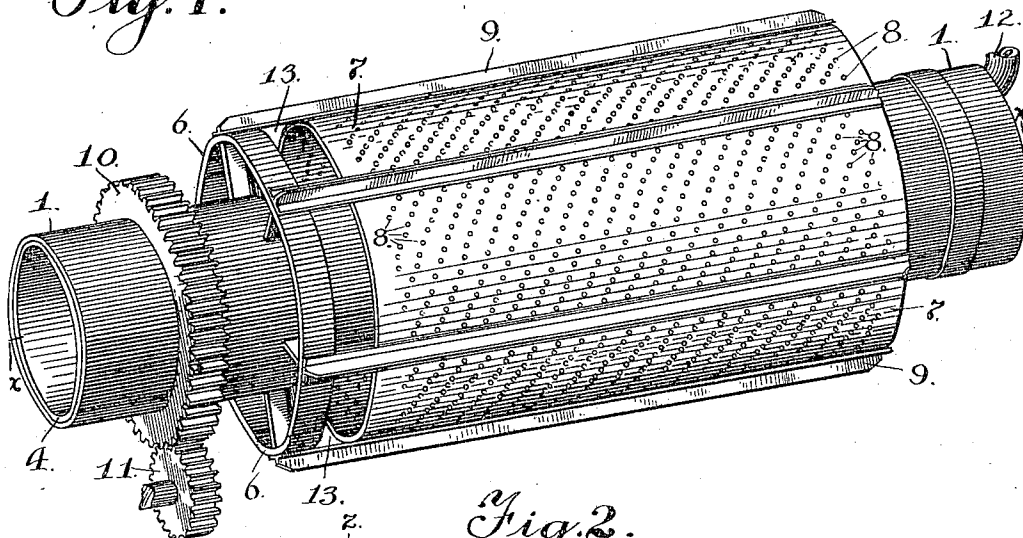


Fig. 2.

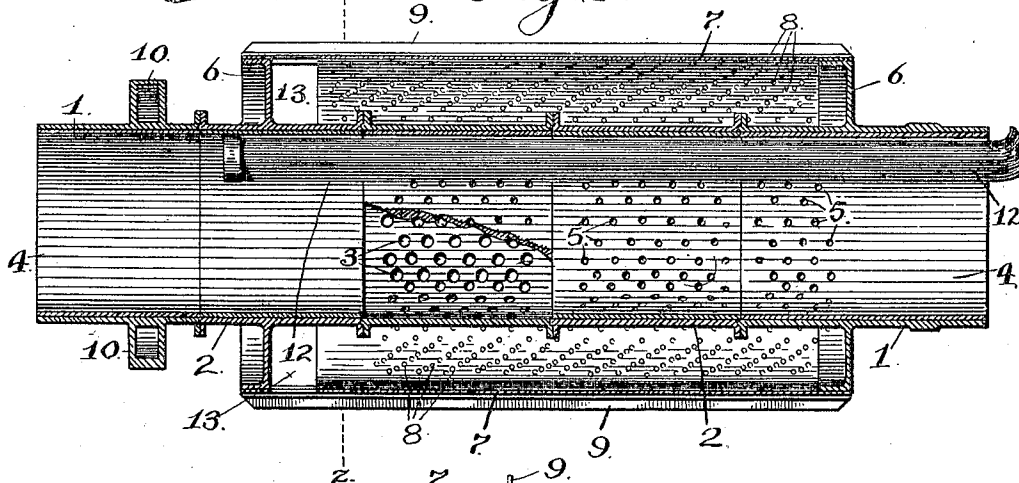
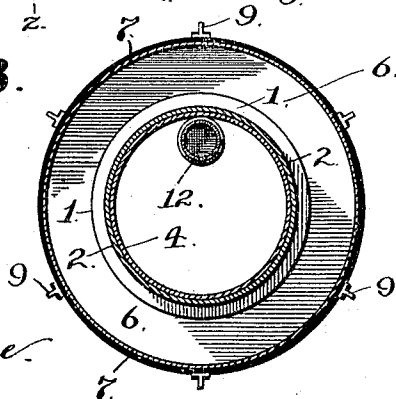


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SEPARATING-CYLINDER FOR GOLD-DREDGERS.

No. 838,579.

Specification of Letters Patent.

Patented Dec. 18, 1906.

Application filed May 15, 1905. Serial No. 260,510.

To all whom it may concern:

Be it known that I, ROBERT H. POSTLETHWAITE, a subject of the King of Great Britain, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Separating-Cylinders for Gold-Dredgers; and I hereby declare the following to be a full, clear, and exact description of the same.

The present invention is designed more particularly for use in connection with that type of gold-dredgers fully set forth and described in Letters Patent of the United States No. 622,532, granted me for an improved gold-dredging apparatus on the 4th day of April, 1899, or to that class of dredger used for the recovery of gold wherein the excavated material is dumped or discharged from the excavating device into the upper end of a rotary separator or "grizzly," the precious metal contained in the material discharged therein escaping through the openings or perforations in the wall of the separator or grizzly onto collecting-tables arranged beneath the same.

The capacity of the machines used for the dredging of gold-containing material is mainly controlled by the capacity of the rotary separator or grizzly used to treat the material delivered thereto. It is obvious that if material is fed into the separator in such quantity that the same cannot be thoroughly worked therein the separator becomes clogged, so to speak, and much of the values of the material will be lost by passing off with the tailings or worthless portions discharged from the lower open end of the separator or grizzly. The excavating means of the dredger is capable of delivering a greater quantity of material to the separator or grizzly than can be treated therein as at present constructed. This defect it has been sought to remedy by increasing the length and diameter of the rotary separator or grizzly; but the employment of such enlarged separators has only partially solved the difficulty. It is apparent that the diameter and length of the separator has confines which it cannot exceed and be operated with any practical success. For instance, if the diameter be increased beyond a certain size the interior wall-surface thereof becomes flattened to such an extent that the material

to be worked will simply slide over such surface, and in due time the perforations will become clogged or filled up. On the other hand, the length of the cylinder-separator cannot exceed approximately twenty feet, else too much power is required to practically work the said separator. Besides, the size of the dredger, with its working mechanism, will not allow for a larger cylinder-separator.

The best result is obtained by the use of a cylinder about four feet in diameter with a length of working surface of approximately twenty feet.

The object of the present invention is to substantially double the capacity of the cylinder-separator, which is accomplished by so constructing the same as to permit of an initial separation therein to separate such portion of the material as will not pass through openings ranging in diameter from two and one-half inches to three inches, the material passing through such size openings being treated to a second working of the separator, which final working eliminates the precious metal from the washed material, the greater portion of base or worthless material being discharged from the lower open end of the cylinder-separator.

To comprehend the invention, reference should be had to the accompanying sheet of drawings, wherein—

Figure 1 is a perspective view of the improved cylinder-separator. Fig. 2 is a longitudinal sectional view in elevation taken on the line *xx*, Fig. 1, of the drawings; and Fig. 3 is a sectional end view in elevation of the separator.

In the drawings the numeral 1 is used to indicate the inner cylinder of the separator, which preferably consists of a series of cylindrical sections 2, united end to end. These sections are preferably composed of cast-steel, each section being formed with a series of perforations or outlet-openings 3 of about three inches in diameter. The entire inner surface of the said cylinder is protected by a lining 4, composed of steel sections, which lining when worn may be removed and replaced by new sections. The inner surface of the cylinder 1 is thus fully protected against the excessive wear to which cylinder-separators are subjected. The said interior lining 4 is pro-

vided with a series of circumferentially-disposed perforations or outlet-openings 5, which register with the perforations or outlet-openings 3 of the inner cylinder 1. These
 5 perforations or outlet-openings of the said lining are slightly less in diameter than the outlet 3, the same being about two and one-half inches in diameter. The reason for this variance is due to the fact that the openings
 10 of the lining gradually enlarge from wear.

The two end sections of the inner cylinder are provided with a circular web or flange 6, which projects outwardly to a distance of approximately twelve inches. These circular
 15 webs or flanges are encircled by a shell or cylinder 7. This outer shell or cylinder, which is composed of a series of cylindrical cast-steel sections, is formed with a series of perforations or outlet-openings 8, the size of
 20 which openings or perforations is approximately three-eighths of an inch in diameter or of such diameter as will permit of only fine material escaping therethrough, said cylinder or shell being held in place and strengthened
 25 by means of a series of spaced longitudinally-disposed T-shaped bars 9, which bars at each end are properly united to the circular webs or flanges 6 of the inner cylinder, which webs or flanges 6 hold the outer cylinder or shell 7
 30 at a given distance away from the inner shell or cylinder 1.

To one of the projecting ends of the inner cylinder or shell 1 is secured an encircling cog-ring 10, which meshes with a drive-cog 11.
 35 This cog is driven by any suitable mechanism (not shown) for imparting rotation to the rotary separator.

Into the inner cylinder or shell 1 leads a perforated spray-pipe 12, the outer end of
 40 which is presumed to connect with a suitable force-pump (not shown) for delivering water under pressure through the perforated spray-pipe 12 to the interior of the inner cylinder or shell. This pipe is arranged near the upper
 45 surface of the said inner cylinder or shell, the size thereof being approximately ten inches in diameter. Said spray-pipe extends substantially the length of the rotary separator, the water ejected under pressure from its perforations being ejected onto the material
 50 being worked therein.

When situated for work in connection with a dredger, the separator is arranged so as to have a downward inclination.

55 The material to be worked is delivered within the inner shell or cylinder 1 at its upper open end, said material as it travels toward the lower open end thereof being thoroughly broken up and separated by the rotary motion of the cylinder and the action of
 60 the water discharged thereon from the spray-pipe. Such portions of the material as will pass through the openings or perforations of the inner cylinder escape therethrough into
 65 the outer shell or cylinder, while the material

too coarse to pass through said openings or perforations is gradually carried the length of the said inner cylinder or shell and discharged from the lower open end thereof. A
 70 primary or initial separation thus takes place in the inner cylinder or shell, the coarse particles being separated from such as will pass through given-size outlet-openings.

The material which enters from the inner cylinder or shell into the outer cylinder or
 75 shell receives the same treatment as in the said inner shell or cylinder. However, it having been freed of the large-size stones and foreign substances the material is much
 80 easier to work and separate. The rotary action of the separator and the water flowing through the perforations of the inner cylinder or shell is sufficient to thoroughly break up and separate such material. The finer portion
 85 thereof, together with the gold carried thereby, escape through the comparatively small outlet-openings or perforations of the outer shell or cylinder and fall onto collecting-tables arranged below the rotating separator, while the stones and material too
 90 coarse to pass through said openings or perforations gradually work toward the tail of the separator and discharge from the lower open portion 13 of the outer shell or cylinder.

By the use of the described separator there
 95 is secured approximately double the working surface of an ordinary rotary separator, the initial or primary separation given the material preventing clogging and permitting a
 100 greater quantity of material being treated and handled than possible by the use of a single-cylinder separator.

It will be understood that the mentioned size of the perforations for the inner and
 105 outer cylinders or shells may be increased, decreased, or varied at will, and it will also be understood that the lining described for the inner shell or cylinder may be entirely omitted, if so desired.

Having thus described the invention, what
 110 is claimed as new, and desired to be protected by Letters Patent, is—

1. A rotary grizzly or separator, the same comprising an inner shell or cylinder, a lining
 115 therefor, the cylinder and lining having a series of outlet-openings in the walls thereof, and an outer shell or cylinder surrounding the inner shell or cylinder, the wall of said
 120 outer shell or cylinder being provided with a series of outlet-openings of less diameter than those of the inner shell or cylinder.

2. A rotary grizzly or separator, the same comprising an inner shell or cylinder, a series of outlet-openings in the wall thereof, a water-
 125 supply pipe extending therein, circular webs connected to the outer face of the inner shell or cylinder, an outer shell or cylinder arranged intermediate said webs and being slightly less in length than the space between
 130 said webs whereby an outlet-opening is

formed at one end of the cylinder, means for connecting said outer cylinder to the inner cylinder, and a series of outlet-openings in the wall of said shell or cylinder, which outlet-openings are of less diameter than those of the wall of the inner shell or cylinder.

3. A rotary grizzly or separator, the same comprising an inner shell or cylinder, a series of outlet-openings in the wall thereof, a water-supply pipe extending therein, circular webs connected to the outer face of the inner shell or cylinder, an outer shell or cylinder arranged intermediate said webs, and being slightly less in length than the space between said webs whereby an outlet-opening is formed at one end of the cylinder, the inner shell or cylinder extending at one end beyond the adjacent webs and having connected directly thereto an operating-gear, the said gear, means for connecting the outer cylinder to the inner cylinder, and a series of outlet-openings in the wall of said outer shell or cylinder, which openings are of less diameter than those of the wall of the inner shell or cylinder.

4. A rotary grizzly or separator, the same comprising an inner shell or cylinder, a series of outlet-openings in the wall thereof, a water-supply pipe extending therein, circular webs connected to the outer face of the inner shell or cylinder, an outer shell or cylinder arranged intermediate said webs, the inner shell or cylinder extending at one end beyond the adjacent webs and having connected directly thereto an operating-gear, the said gear, a series of spaced longitudinally-disposed bars connecting the outer shell to said webs, and a series of outlet-openings in the wall of said outer shell or cylinder, which outlet-openings are of less diameter than those of the wall of the inner shell or cylinder.

5. A rotary cylinder or separator comprising a cylinder into which the material to be worked is delivered, the same having a series of outlet-openings in the wall thereof, and an inner lining for the cylinder, the lining having a series of openings in its wall arranged to register with the openings in the cylinder and being slightly smaller than said openings in the cylinder.

6. A rotary separator comprising a cylinder into which the material to be worked is delivered, the same having a series of outlet-openings in the wall thereof, a water-supply pipe extending into the said cylinder for de-

livering the requisite water to the material while being worked, and an inner lining for the cylinder, the lining having a series of openings in its wall arranged to register with the openings in the cylinder and being slightly smaller than said openings in the cylinder.

7. A rotary grizzly or separator, the same comprising an inner shell or cylinder into which the material to be worked is delivered, a lining therefor, a series of outlet-openings in the wall of the lining and in the wall of the shell or cylinder, a water-supply pipe extending into the said shell or cylinder for delivering the requisite water to the material while being worked, and an outer shell or cylinder secured to and surrounding the inner shell or cylinder, the wall of said outer shell or cylinder being provided with a series of outlet-openings of less diameter than those of the inner shell or cylinder.

8. A rotary grizzly or separator, the same comprising an inner shell or cylinder, a series of outlet-openings in the wall thereof, a water-supply pipe extending therein, circular webs connected to the outer face of the inner shell or cylinder, an outer shell or cylinder arranged intermediate said webs, and being slightly less in length than the space between said webs whereby an outlet-opening is formed at one end of the cylinder, a series of spaced longitudinally-disposed bars connecting the outer shell to the said webs and extending over said outlet-opening and a series of outlet-openings in the wall of said shell or cylinder, which outlet-openings are of less diameter than those of the wall of the inner shell or cylinder.

9. In a rotary grizzly or separator, a rotary cylinder having a series of openings therein, and an inner lining for said screen having a series of openings therein of lesser diameter than those of the cylinder and arranged to register therewith at all times, whereby no portion of the wall surrounding said openings is subjected to the direct action of the material being operated upon within said cylinder.

In testimony whereof I have hereunto affixed my signature in the presence of witnesses.

ROBERT H. POSTLETHWAITE.

Witnesses:

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D. B. RICHARDS.