No. 843,466. PATENTED FEB. 5, 1907.

W. M. KRICKBAUM.

ROTARY CLEANING CYLINDER.

APPLICATION FILED JULY 31, 1902.

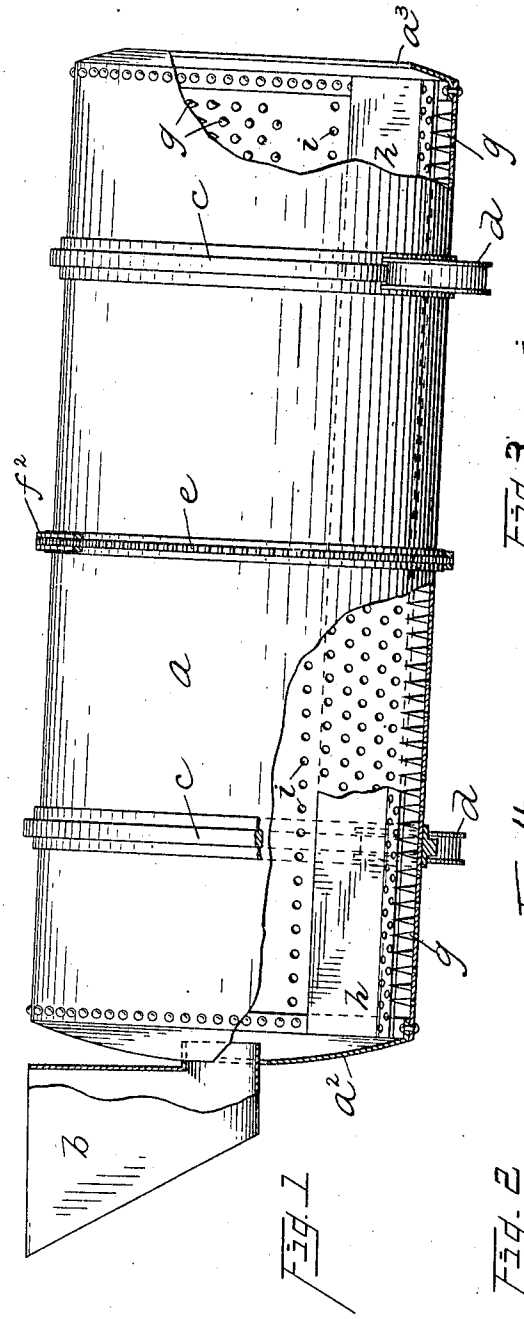


Fig. 1

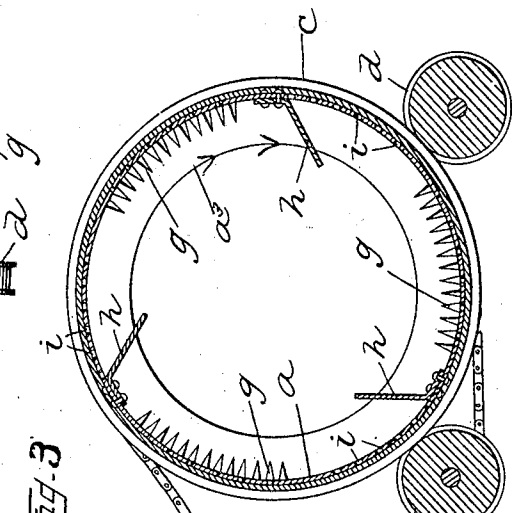


Fig. 3

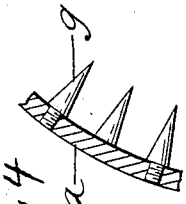


Fig. 4

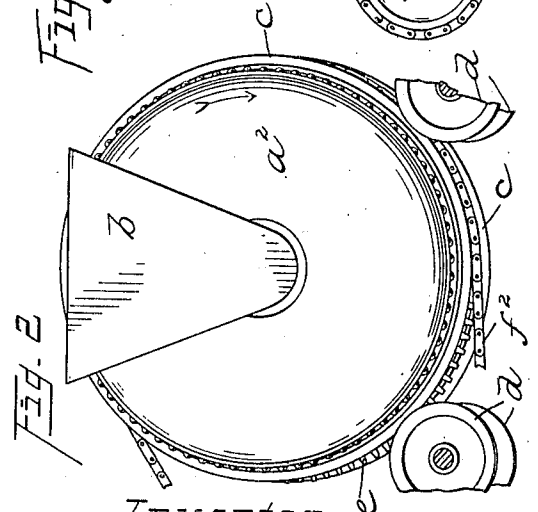


Fig. 2

Witnesses:-

A. L. Lord

Carl W. Schaefer.

Inventor:-

William M Krickbaum.

by his Attorney

Albert G. Davis & Co.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM M. KRICKBAUM, OF CLEVELAND, OHIO, ASSIGNOR TO THE GRASSELLI CHEMICAL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

ROTARY CLEANING-CYLINDER.

No. 843,466. Specification of Letters Patent. Patented Feb. 5, 1907.

Application filed July 31, 1902. Serial No. 117,872.

To all whom it may concern:

Be it known that I, WILLIAM M. KRICKBAUM, a citizen of the United States of America, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Rotary Cleaning-Cylinders, (Case No. 1,) of which the following is a specification.

My invention relates to improvements in rotary cleaning-cylinders for pyrite, coal, ores, &c., and has for its object the provision of simple and efficient means for acting upon and for cleaning continuously relatively large quantities of coarse materials, such as those named. For example, pyrite or native iron disulfid in its natural state is commonly found with adhering strata of foreign material which must be chipped or broken off and separated therefrom in order that the pyrite may be employed in the arts.

The device of my invention is admirably adapted for acting upon this and other minerals, the same consisting, in brief, of a rotating containing-cylinder provided with a multitude of interiorly-disposed abrading or sharpened parts against which the mineral is repeatedly dashed by the rotation of said cylinder, perforations or screen-like openings in the shell of the said cylinder affording exit for the smaller particles which are to be sifted out. Within this cylinder or drum there are preferably mounted a plurality of semipartitions or carrying-aprons for raising the mineral under treatment some distance before dropping it upon the sharpened parts. A driving-chain serves to rotate the drum, which is supported in a substantially horizontal position by means of carrying rolls or wheels, permitting its ready axial rotation. The details both of construction and operation will be more easily appreciated by referring to the accompanying drawings in connection with the following portions of the specification, in which drawings—

Figure 1 is a side view of my improved device partially in elevation and partially broken away and in section, while Fig. 2 is an end view of the device in elevation, showing the feed or hopper. Fig. 3 shows the device in vertical section, together with its driving mechanism. Fig. 4 is merely a fragmentary view showing the preferred form of spike for insertion in the shell of the cylinder.

The same letter or character of reference is employed therein to designate similar parts.

At the left of the drum or cylinder *a*, which is formed of boiler-plate and provided with partial heads a^2 a^3, riveted in at its ends is shown the feed or hopper *b* for containing the pyrite, ore, or other mineral to be acted upon. Rigid encircling rails *c* rotatably support the cylinder upon the four flanged wheels *d*, while a central toothed rail *e* is engaged by the driving-chain f^2, which passes over the sprocket-wheel f^3, mounted on the driving-shaft *f*.

In order to secure sufficient flexibility in the driving mechanism and permit the cylinder the necessary freedom or independence of movement, a laterally-disposed driving-wheel and shaft are employed connected with the central toothed rail on said cylinder by a relatively long driving-chain, which serves positively to rotate the cylinder with ease even when angularly disposed with respect to the driving-shaft or at varying distances therefrom.

Screwed into the shell of the cylinder are a large number of sharp spikes *g*, interiorly studding three sections of the said cylinder. These spikes are of conical form at their upper ends and terminate below in threaded base portions which engage tapped holes in the cylinder.

Adjacent to the spike-studded sections are three inclined aprons or longitudinal semipartitions *h*, riveted to the shell of the cylinder in position to carry the material within the drum by reason of its rotation from the bottom portion to the upper portion thereof, whence it falls upon the series of sharp spikes then immediately below the same, thereby flaking or chipping off the foreign material from the pyrite under treatment, or, if the drum be constructed of sufficiently large proportions, breaking the contained mineral upon the spikes.

The flaked-off material or smaller particles will find exit from the drum through the holes *i*, perforating the shell in corresponding sections or areas between the several sections of spikes and their carrying-aprons.

The cylinder or drum shown preferably is rotated upon its axis in a clockwise direction through the medium of the sprocket-wheel and driving-chain. Supporting-wheels *d* carry

the drum upon the rigid bands or rails *c* and permit of its ready rotation.

Mineral is constantly admitted from the feed or hopper at the left-hand end of said cylinder, which in practice is slightly raised or blocked up to secure the desired fall toward the other or discharging end thereof. The said mineral is successively engaged by the aprons and carried to a position near the top portion of the drum, from which it falls upon the sharp-pointed spikes immediately beneath, thus chipping or breaking off portions thereof or the adhering foreign material, the mineral being again and again carried up and dropped from the aprons until through the fall toward the right-hand end of the cylinder it reaches a position from which it can be shoveled or otherwise removed from the drum.

While shifted about within the drum or cylinder the smaller particles of the mineral fall through the openings in the shell. Also during the drop from the aprons, these particles, being of less weight, tend to fall upon the perforated areas positioned in the rotating drum somewhat beyond the breaking-points or spikes, thereby assisting in sifting out the same, which material collects beneath the drum, whence it may easily be removed. Accordingly the screening areas preferably are situated beyond the spike-studded portions and adjacent to the aprons, not only upon this account, but in order to leave the shell of the cylinder stronger than it otherwise would be were it drilled to provide the perforations for the screen over the same areas tapped out to receive the spikes. With the screens positioned thus, too, the refuse is sifted out each time just before the material is carried up in the succeeding apron.

By reason of the employment of a driving-chain the fall toward the right-hand end of the cylinder may be altered and adjusted as required merely by blocking up the supporting parts of the left-hand end in a manner it is not necessary to show without making a corresponding change in the driving mechanism, which feature is found to be of material advantage. The described manner of carrying the drum upon exterior supporting-wheels not only makes the interior much more accessible, but is a more desirable mounting therefor than a shaft.

The spikes being rigidly secured in the shell near the periphery of the drum afford a very effective means for flaking off or reducing the material to be treated and when dull or broken may very easily be replaced.

It is self-evident that the position and angle of the aprons, the size of the drum, and the disposition of its effective parts may be altered as desired to effect the various operations of cleaning, separating, breaking, or otherwise treating minerals.

Having now described the preferred embodiment of my invention, I claim as new, and desire to secure by Letters Patent, the following:

1. In a rotary cleaning-cylinder, the combination with the rotatably-mounted drum wherein the treated material is acted upon, the same being inclined as desired, of a plurality of spike-studded sections therein, corresponding carrying-aprons adapted to convey and direct the treated material against the latter, screens or perforated areas for separating out the refuse, means for supporting the drum rotatably, a central toothed driving-rail, a stationarily-mounted driving-sprocket, and a driving-chain flexibly connecting the driving rail and sprocket, substantially as set forth.

2. In a device of the class described, the combination with a drum or cylinder wherein the material is acted upon, of supporting bands or rails encircling the same, supporting-wheels rotatably mounting the drum, and flexible driving mechanism comprising a laterally-disposed gear-wheel, a toothed driving-rail upon the cylinder and a loose and relatively long driving-chain connecting the same for rotating said drum upon its supporting-wheels, substantially as set forth.

3. In a device of the class described, the combination with a rotatably-mounted metal shell or cylinder, of a plurality of sections therein studded with sharpened parts, a plurality of carrying parts or aprons adapted to convey and direct the treated material against the same, and a screen or perforated section provided in said drum or cylinder, beyond each of the studded sections, and immediately before the carrying-aprons, for separating out the smaller particles of the treated material, as broken therefrom, substantially as set forth.

4. In a device of the class described, the combination with a rotatably-mounted drum wherein the material is acted upon, of a plurality of spike-studded sections therein, corresponding carrying-aprons adapted to convey and direct the treated material against the same, and corresponding screens or perforated sections extending over different displaced areas, for separating out the smaller particles of the treated material, substantially as set forth.

5. In a device of the class described, the combination with a drum wherein the material is acted upon, the same being inclined from end to end as desired, of a plurality of sharpened parts disposed therein, means comprising a conveying-apron for directing the material against the same, a screen or perforated section for separating the smaller particles, supporting-wheels rotatably mounting the drum, and flexible driving mechanism comprising a laterally-disposed gear-wheel, a toothed driving-rail upon the cylinder and a loose and relatively long driving-chain con-

necting the same for rotating said drum upon the wheels, substantially as set forth.

6. In a device of the class described, the combination with a rotatably-mounted drum or cylinder wherein the treated material is acted upon, of a plurality of spike-studded sections within the drum, corresponding carrying-aprons adapted to convey and direct the treated material against the same, screens or perforated sections for separating out the smaller particles of said material, supporting bands or rails encircling the drum, supporting-wheels engaging the same and rotatably mounting said drum, and flexible driving mechanism for rotating the drum upon said wheels, substantially as set forth.

Signed at Cleveland, Ohio, this 24th day of July, 1902, in the presence of two subscribing witnesses.

WILLIAM M. KRICKBAUM.

Witnesses:
T. J. Ross,
Albert Lynn Lawrence.