H. K. BURCH.

REVOLVING SCREEN OR GRIZZLY.

APPLICATION FILED MAY 16, 1921.

1,420,685.

Patented June 27, 1922.

3 SHEETS—SHEET 1.

Fig. 1.

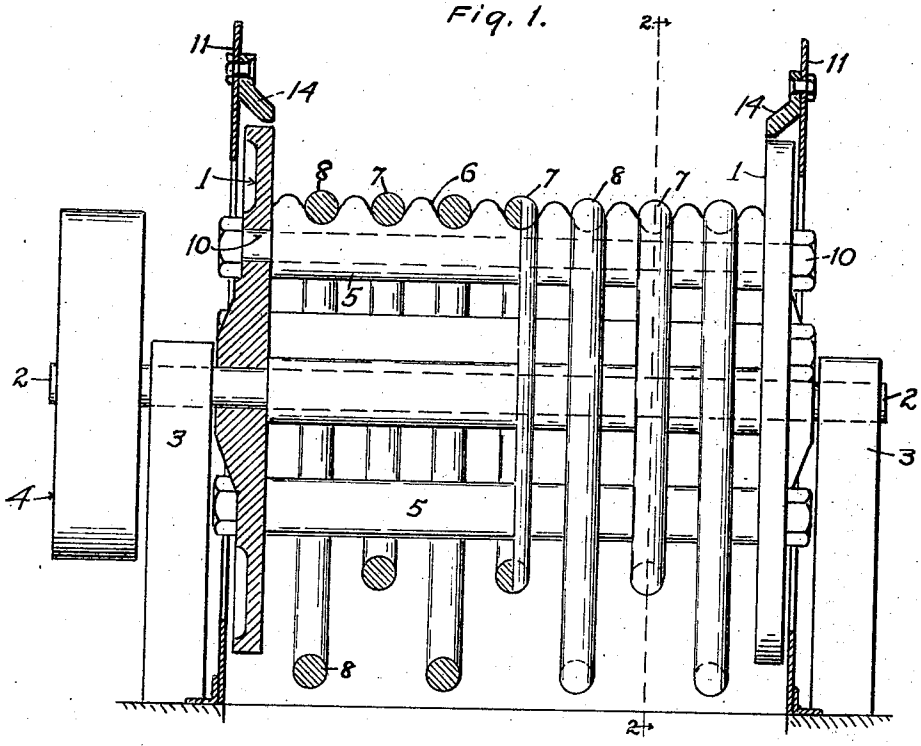
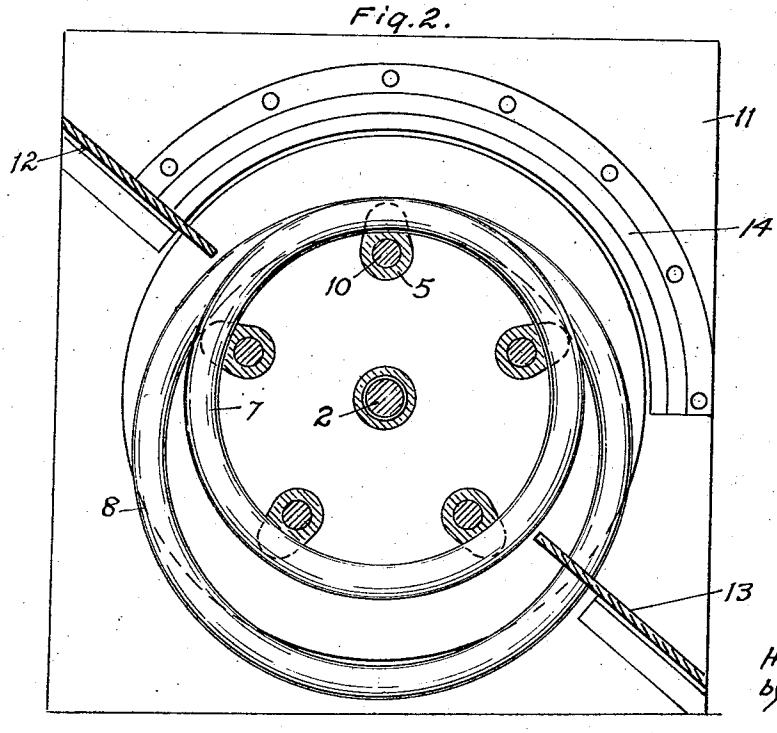


Fig. 2.



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Fig. 3.

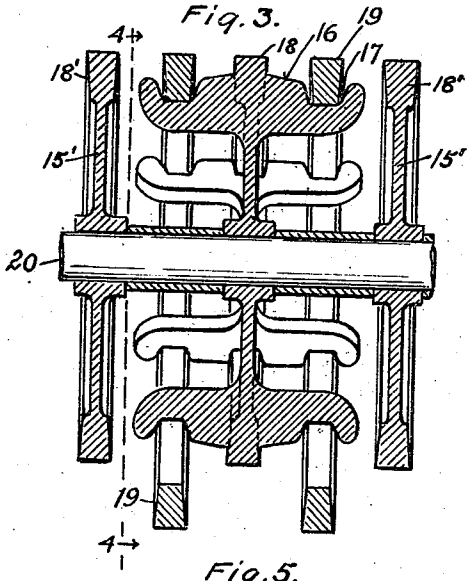


Fig. 4.

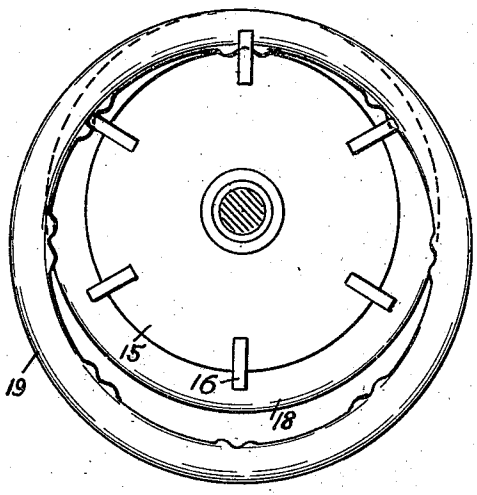


Fig. 5.

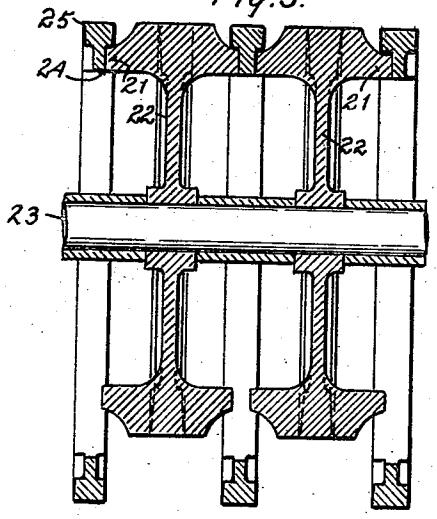


Fig. 6.

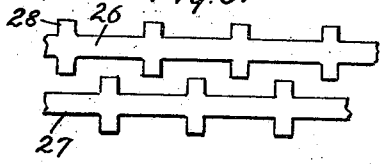


Fig. 7.

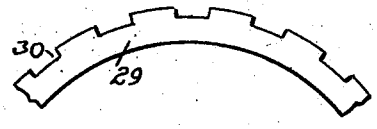
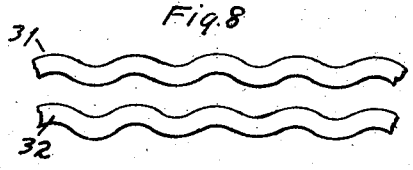


Fig. 8



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3 SHEETS—SHEET 3.

Fig. 9.

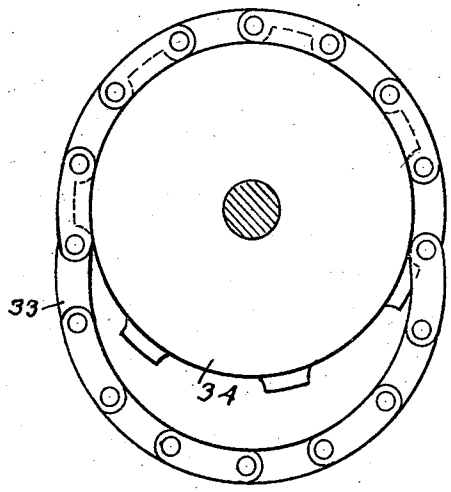


Fig. 10.

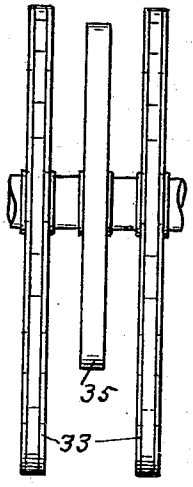


Fig. 11.

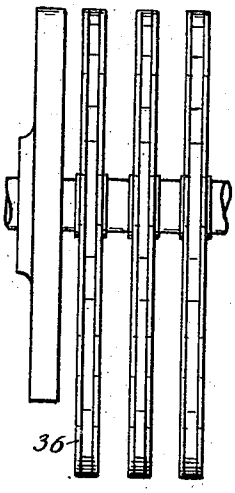
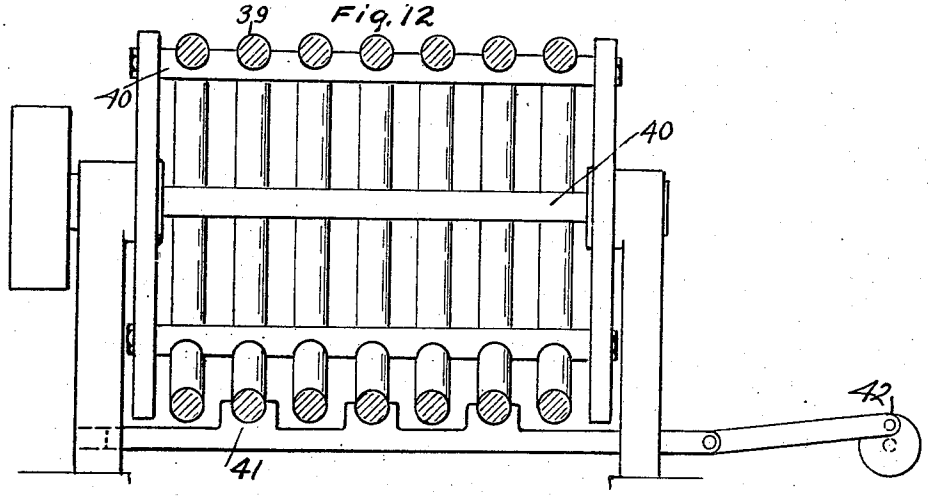


Fig. 12.



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UNITED STATES PATENT OFFICE.

HENRY KENYON BURCH, OF WARREN, ARIZONA.

REVOLVING SCREEN OR GRIZZLY.

1,420,685. Specification of Letters Patent. Patented June 27, 1922.

Application filed May 16, 1921. Serial No. 469,867.

To all whom it may concern:

Be it known that I, HENRY KENYON BURCH, a citizen of the United States, residing at Warren, in the county of Cochise and State of Arizona, have invented a new and useful Improvement in Revolving Screens or Grizzlies, of which the following is a specification.

This invention relates to a screen or grizzly for removing the finer particles or pieces ("undersize") of ore, rock, gravel, coal, etc., from the coarser pieces ("oversize") of such material.

The main object of the present invention is to provide a rotary screen or grizzly for this purpose which will be simple and cheap in construction and economical and effective in operation.

Further objects of the invention are as follows:

To provide a machine for this purpose requiring only a small power to operate;

To provide for the stated purpose a machine which will be self-cleaning and will not become choked with material lodging within it;

To so construct the machine that the necessary repairs and replacements can be made readily and without the attention of skilled mechanics;

To reduce the wear on the machine to a minimum by so constructing the machine that the revolving rings, disks or screening elements travel in the direction of the heaviest and coarsest material and offer the least possible interference to the travel of the material.

The accompanying drawings illustrate embodiments of my invention, and referring thereto:

Figure 1 is a partly sectional side elevation of one form of the invention;

Fig. 2 is a section on line 2—2 in Fig. 1;

Fig. 3 is a longitudinal section showing another form of the invention;

Fig. 4 is a section on line 4—4 in Fig. 3;

Fig. 5 is a longitudinal section of another modification;

Fig. 6 is a developed plan view of a modified form of screening element;

Fig. 7 is a side elevation of another modified form of screening element for use with the invention;

Fig. 8 is a plan view of another modification of the screening element;

Fig. 9 is a transverse section of another form of the invention in which a chain or flexible member is used as a screening element;

Fig. 10 is a partial side elevation of the construction shown in Fig. 9;

Fig. 11 is a partial side elevation of another modification;

Fig. 12 is a longitudinal section of a further modification.

My invention comprises, for example, as shown in Figs. 1 and 2, a plurality of screen elements mounted on rotating supporting means, said screen elements comprising, for example, a series of circular rings mounted on a revolving frame or carrier. Said revolving frame may comprise heads or disks 1 mounted by trunnions or shaft means 2 in bearings 3 and driven by operating means such as a driving wheel 4; and bars 5 rigidly connected to said disks or heads and carrying the screen elements.

The bars 5 are provided with notches or saddles 6 to receive and support the screen elements which are formed as rings seated in said saddles or notches. Alternate rings, indicated at 7, are or may be rigidly mounted in said seats in the bars 5 and the intervening rings 8 may be loosely mounted in their seats in said bars and are preferably larger than the rings 7 so that the lower portions of the loose rings 8 will extend below the lower portions of the fast rings 7 to provide for clearance for "undersize" material passing through the screen. The upper portions of the respective rings 7 and 8 may be of substantially the same height, or, if desired, the rings 8 may be somewhat lower or somewhat higher than the rings 7 at the upper portion thereof. The bars 5 for mounting the respective rings 7 and 8 may be secured to the heads 1 in any suitable manner, for example, by bolts 10, said bars and heads constituting a rigid rotary frame. With this construction it is not necessary that the shaft means 2 should extend through the frame, and the portion of said shaft means between the heads of the frame may, therefore, be omitted.

Side plates 11 may be provided having

deflector flanges 14 for guiding the material onto the screen or grizzly and upper and lower guide plates or chute means 12 and 13 may be provided for supplying material to the screen and conveying away the "oversize."

The operation of the apparatus is as follows:

The material to be screened (ore, rock, gravel or coal) is supplied to the grizzly by chute means 12 and passes down onto and over the screen elements 7 and 8, which are caused to revolve or travel forward in the direction of motion of the material by operation of the shaft means 2. The supporting means for the loose rings 8 maintains them in proper position parallel to and spaced from the alternate fast rings 7 so as to always maintain a suitable spacing for the operation of the screen or grizzly, but the mounting of the loose rings is such as to permit a slight yielding thereof in case there is any tendency to bind or clog. The "undersize" will pass between the rings or disks and fall through the grizzly directly to an "undersize" chute, while the "oversize" will be carried over and out of the stream by the rotation of the grizzly, and will fall into the "oversize" chute. The rotation of the framework not only will give a rotating motion to the loose rings which will carry forward the coarse ore, but also a slight up and down and oscillating motion, which will further tend to break up the ore stream and release the undersized particles, so that they will fall through the grizzly. The increased clearance between the adjacent rings at their lower edges which constitute the discharge portion of the screen will prevent any wedging of the undersized particles in the grizzly, with the result that it will be self-cleaning and thus operate at maximum efficiency. The fact that the screen elements extend and travel in the direction of travel of the "oversize" tends to reduce to a minimum the wear on these parts. "Undersize" material passing through the upper portions of the rings 7 and 8 has a free exit at the bottom portion of said rings by reason of the relatively larger opening at such portion, due to the fact that the loose rings 8 are larger than the fast rings 7. The described arrangement, in which the material is fed on top of the screen and travels circumferentially of the screen, gives a width of screening surface equal to the length of the screen, whereas, in screens of the trommel type, in which the material is fed into the interior of the screen and travels longitudinally or parallel to the rotative axis of the screen, the width of screening surface is limited to a relatively narrow zone at the concave lower part of the screen. Moreover in screens of the trommel type having circumferential screen bars, the axial travel of the material causes excessive wear and expenditure of power, due to the long path of travel of the material over and transverse to said bars, as compared with the short travel of the material parallel to the bars and over the top of the screen in the construction herein described.

With the larger openings at the discharge part of the screen at the bottom thereof and with the feed on top of and over the screen as herein described, there is no liability of the material entering between converging surfaces of the screen in the rotation thereof, and being crushed or subjecting the parts to undue strains.

Furthermore, the construction described is advantageous in that it requires no machine work aside from the bearings and the mounting of the frame bars in the heads; the parts being otherwise assembled in rough condition and at minimum expense.

In the form of the invention shown in Figs. 3 and 4 the rigid or fast screen members are formed as annular flanges 18 on disks 15 carried by the shaft of the rotating frame, said disks having lateral projections or lugs 16 provided with notches 17 in which the loose rings 19 are seated. These disks 15 alternate with disks 15′ having flanges 18′ acting as screen elements, all the disks 15 and 15′ being rigidly mounted on the carrying shaft 20 and being so spaced from one another and from the loose rings as to permit free passage of the "undersize" which it is desired to separate.

A similar construction is shown in Fig. 5, except that the lateral lugs or arms 21 on the disks 22 carried by the rotating shaft 23 engage with lateral notches 24 in the loose rings 25 to support said rings.

As shown in Fig. 6, the rings or screen elements, indicated at 26 and 27, may be provided with lateral lugs or projections 28 in staggered relation on adjacent rings to form the sizing screen. The rings or screen elements may be smooth, or, as shown in Fig. 7, the rings, indicated at 29, may be provided with peripheral notches 30. In some cases it may be desirable to form the rings or screen elements as shown at 31 and 32 in Fig. 8, with wavy undulating contour.

The screen elements may be formed as chains or flexible members, thus, as shown in Fig. 9, a series of chains 33 may be mounted on rotating carrier disks or wheels 34 spaced apart to provide for passage of the "undersize" therebetween. These chain members may alternate with rigid members, as shown at 35 in Fig. 10, or, as shown in Fig. 11, all of the screening elements may consist of chains 36 suspended from the rotating carrier wheels 27 and extending sufficiently below said carrier wheels to provide for lateral displacement of the chains at the lower portions thereof, so as to prevent any

choking of such portions by descending "undersize" material. The screen elements may all be at the same level at their upper portions, or, as shown in Fig. 10, certain of said elements, for example, the rigid elements, may be at a different level from the intervening screen elements.

In the place of making the rings of different diameter, they may all be made of the same diameter, as shown in Fig. 12, said rings 39 being mounted on rotating carrier means 40 and certain of said rings may be loose and may be operated by reciprocating means 41 driven by crank or other driving devices 42, so as to move the lower portions of such loose rings back and forth to free any material which might tend to choke the lower portions of the revolving screen. Or, if desired, such reciprocating means may be omitted and the rings may, in some cases, be left free to move laterally at their lower portions, under the weight of the descending material, to allow such material to pass through. As shown in this figure all of the rings may be loose. The rings as shown in this figure are of larger diameter than the rotating carrier means, 20, as to rest on said carrier means at their upper portions, but to hang below and free of said carrier means at their lower portions.

The entire mechanism exposed to the stream of ore, rock, or gravel, will be made of materials that will resist abrasion, and those parts especially subject to wear may be made renewable.

What I claim is:

1. A revolving screen comprising a rotating supporting means, a plurality of screen elements extending in the direction of rotation of said supporting means, and supported at their upper ends on said means, said screen elements extending at substantially the same level at their upper parts to form a receiving portion, and extending at different levels at their lower parts forming a discharging portion with relatively larger discharge openings.

2. A construction as set forth in claim 1 and comprising in addition, means for feeding material to the top of the screen over said receiving portion.

3. A revolving screen comprising a rotatably mounted frame and a plurality of screen elements mounted on said frame to revolve therewith and extending in the direction of motion of the frame, said screen elements being supported at their upper portions on said frame, and certain of said screen elements being loosely mounted on the frame and being free at their lower portions to permit movement thereof transverse to the direction of motion of the rotating frame.

4. A rotating screen comprising a rotating frame, a plurality of screen elements mounted on said frame to revolve therewith, certain of said screen elements being rigidly mounted on the frame and alternate screen elements being loosely mounted on the frame and extending below the screen elements rigidly mounted on the frame to provide increased spacing at the lower portions of such screen elements.

5. A revolving screen comprising a rotating member, a plurality of rings rigidly mounted thereon, loose rings alternating with the aforesaid rings and mounted on the said frame, so as to be suspended from their upper portions and to be loose at the lower portions.

6. A construction, as set forth in claim 5, in which said loose rings are of larger diameter than the other rings to provide for increased spacing at the lower portions of the revolving screen.

In testimony whereof I have hereunto subscribed my name this 3rd day of May 1921.

HENRY KENYON BURCH.