June 24, 1930. M. A. KENDALL 1,766,340

ROLLER GRIZZLY

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Fig. 1

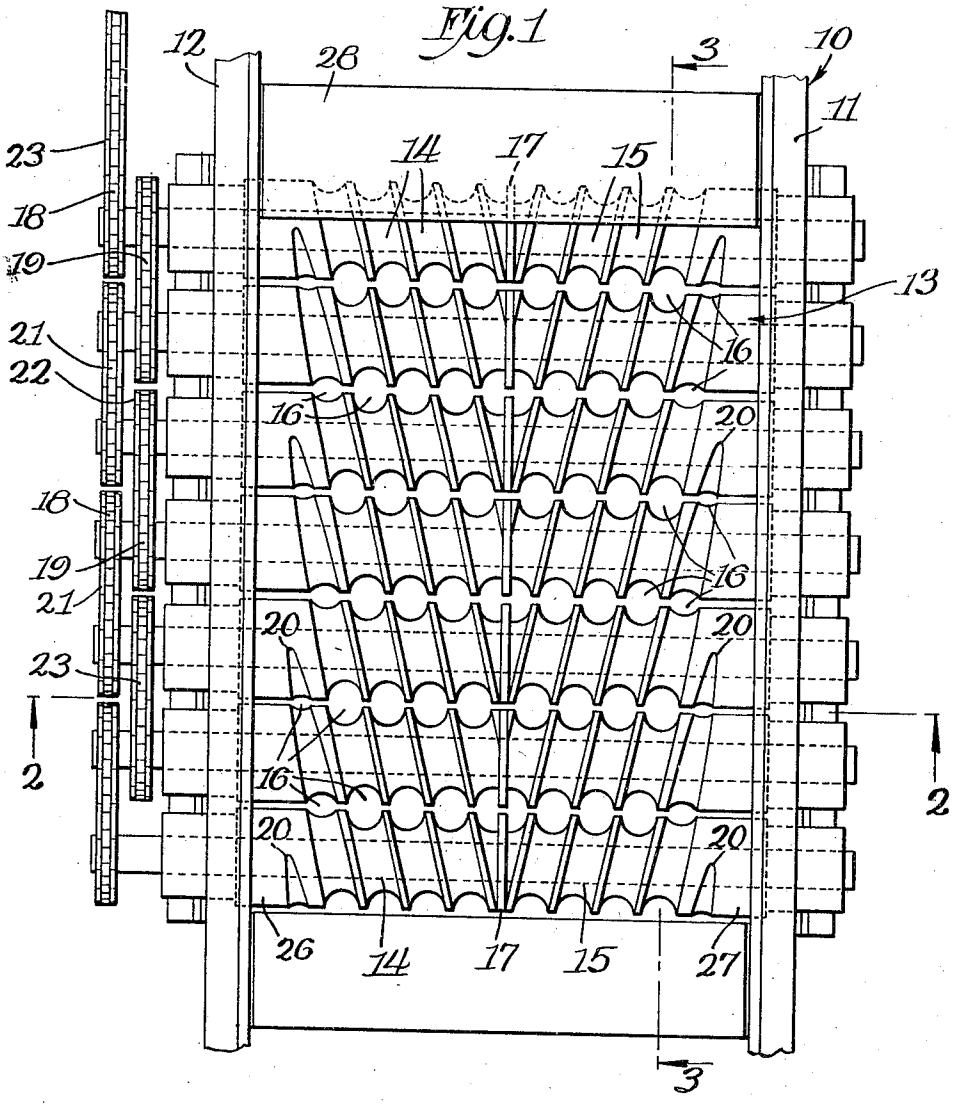
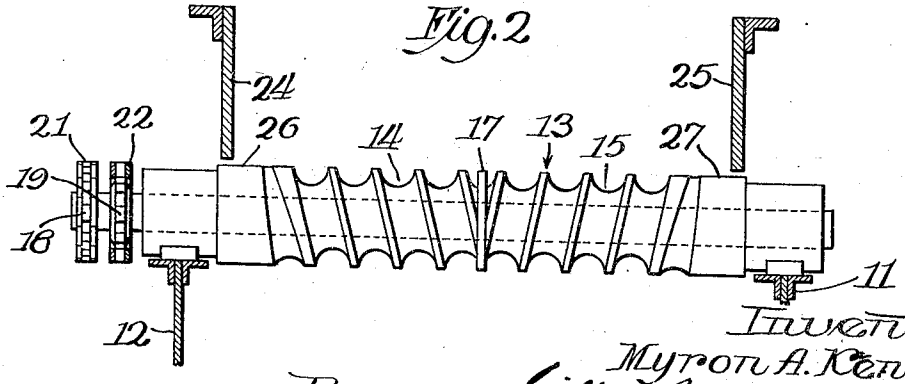


Fig. 2



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ROLLER GRIZZLY

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Fig. 3

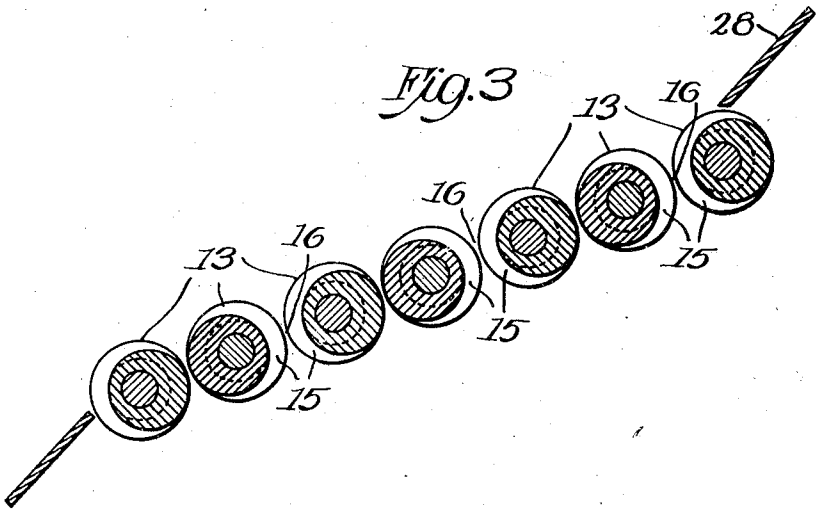


Fig. 4

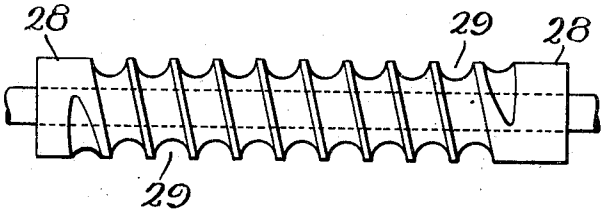


Fig. 5

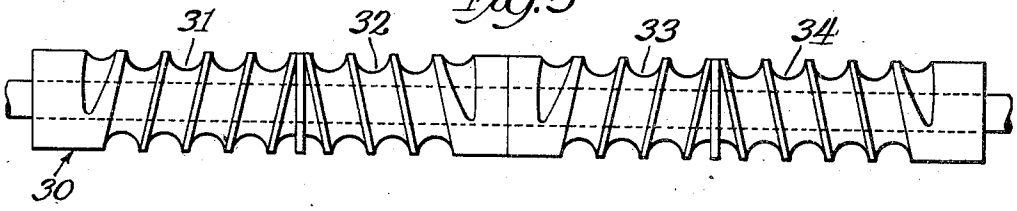
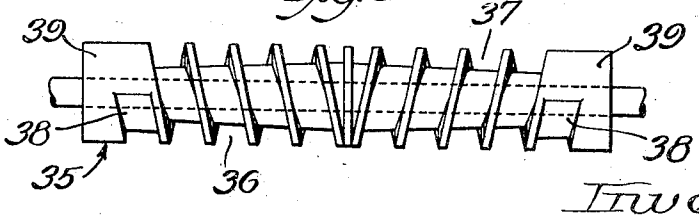


Fig. 6



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UNITED STATES PATENT OFFICE

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ROLLER GRIZZLY

Application filed March 20, 1929. Serial No. 348,483.

This invention relates to devices for screening coal, ore and the like material.

The principal object of the invention is the provision of a screening device that is provided with means for automatically maintaining the openings in the screening bed in operative condition by removing the material that is not large enough to ride down the screen over the openings and that is too large to pass through the openings.

Another object of the invention is the provision of new and improved means for screening material and for automatically removing the slightly oversize material from the screen bed.

A further object of the invention is the provision of means for rapidly moving the material over the screen bed and at the same time efficiently removing material up to a predetermined size.

A still further object of the invention is the provision of a screening device that is cheap to manufacture, easily assembled, efficient in operation, and that is adapted to automatically remove from the openings any material that tends to lodge therein.

Other and further objects and advantages of the invention will appear from the following description taken in connection with the accompanying drawings, in which

Fig. 1 is a plan view of the device;

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

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 shows one of the rollers of a modified form of the device;

Fig. 5 shows one of the rollers of a further modified form of construction; and

Fig. 6 shows one of the rollers of a still further modified form of the device.

In the construction of screening devices of the type known as the grizzly, rollers are provided with a plurality of individual grooves extending about the rollers. These rollers are so arranged that the grooves in one roller are opposite those in an adjacent roller. In screening certain kinds of material such, for instance, as ore or hard coal or other material that is hard and does not crumble easily, the slightly oversize lumps become lodged in the grooves forming the openings because they are too large to pass through the openings and are too small to extend from roller to roller to ride over the openings, and as a result the openings in a short time will become closed with lumps of the slightly oversize material.

The present invention seeks to remedy this difficulty by providing means for automatically removing this slightly oversize material from the openings and discharging it from the screen.

Referring now to the drawings, the reference numeral 10 designates the screening device known in the art as a grizzly. This device comprises the inclined frame members 11 and 12 within which is journaled a plurality of rollers 13.

In the form of the device selected to illustrate one embodiment of the invention, as shown in Fig. 1, these rollers are all of the same diameter and are adapted to be mounted in the frame adjacent to each other. Each roller is provided with right and left spiral grooves 14 and 15 and the grooves of adjacent rollers are arranged opposite each other so as to form screen openings 16 through which the material to be screened is adapted to pass. Extending about the central portion of each roller is a circular flange or collar 17 which divides the two spiral grooves from each other.

Suitable means are provided for rotating the rollers in the same direction. They are so rotated that their upper surface will travel in a direction to cause the larger material to travel down the grizzly. Any suitable means may be employed for that purpose. As shown, a pair of sprockets 18, 19 are mounted on one or both ends of the journal of each roller. Suitable chains 21 and 22 are adapted to engage these sprockets in pairs so that when one of the sprockets is operated by the driving mechanism 23 in one direction, all the sprockets and rollers will be rotated in the same direction.

The depth of the grooves will be determined by the size that it is desired to make the openings. In the form disclosed, the openings are of uniform diameter through-

out the grizzly, but they may be otherwise if so desired.

The grooves may be so arranged that the material lodging in any of the openings will be conveyed toward any desired point on the grizzly. In the form shown in Fig. 1 the grooves are so arranged that the material lodged in the openings will be conveyed toward the outer ends of the rollers. In order to dislodge the material from the openings the grooves at each end of the rollers gradually decrease in depth. By means of this arrangement the material that is conveyed to the shallower portions of the groove will be elevated onto the periphery of the rollers. Preferably the groove terminates at a point 20 spaced from the sides 24 and 25 to provide spaces 26 and 27 on the smooth portion of the rollers for receiving the material conveyed laterally by the rollers. After this material is conveyed to the spaces 26 and 27 it will be conveyed down the grizzly along with the material that is too large to enter the grooves.

In the operation of the device, the material will be delivered to the upper roller over the guide 28 and will pass downwardly over the grizzly, the smaller portions falling through the openings 16 and the particles that are too large to enter the grooves will be conveyed by the rotating rollers down the grizzly.

Certain of the particles that are too large to pass through the openings and not large enough to extend across the grooves from roller to roller are likely to become lodged in the openings. In this event, the spiral grooves will convey these particles toward the sides of the grizzly and they will be elevated to the surface of the rollers by the camming action of the outer ends of the grooves due to their gradual decrease in depth.

From an inspection of Fig. 1, it will be seen that at each rotation of the intermediate rollers a new set of openings is provided at each side thereof. Or from another point of view, the openings may be considered as traveling outwardly from the rib 17 during the operation of the device. The formation of these new openings will tend to keep the grizzly clean and operating at its maximum efficiency.

The form of construction shown in Fig. 1 is by way of example only. The grooves on the rollers may be arranged to conduct the material that lodges in the openings in either direction or in both directions, or partly in one direction and partly in another. The rollers are shown as extending transversely of the frame, but it is understood that they may be arranged in other directions. In Fig. 4 is shown a modified form of roller 28 in which the groove 29 is continuous throughout its length whereby the material that lodges in the openings will all be conveyed to one side only of the grizzly.

In Fig. 5 is shown a roller 30 having a plurality of sections of right and left spiral grooves 31, 32, 33 and 34 whereby a portion of the material lodging in the openings will be conveyed to the sides of the grizzly, and a portion toward the center line thereof.

The grooves in the rollers may be of any desired form in cross-section, those shown in Figs. 1 to 5 are curved, but it is understood that this is by way of example only. If desired, the grooves may be of gradually increasing depth from one end or portion to the other.

In Fig. 6 is shown a further modified form of roller 35 in which the right and left spiral grooves 36 and 37 are rectangular in cross-section. Each of these grooves gradually increases in depth from one end to a point adjacent to the other end of the groove and then rapidly decreases in depth as shown at 38, until it merges into the periphery 39 of the roller at each end thereof. By means of this arrangement, particles lodging in the openings adjacent to the central portion of the roller will be conveyed laterally toward larger openings until they drop through or are lifted to the surface of the rollers by the cam action of the gradually decreasing depth of the portion 38 of the groove.

In all forms of the construction, the rollers are preferably rotated at the same rate of speed so that the grooves of one roller will cooperate with those of an adjacent roller to form openings. The size of these openings will vary to accommodate the work desired.

In all cases, that portion of the groove that gradually decreases in depth is preferably so arranged that it passes from a full depth groove to a point where it merges into the surface of the roller in one turn about the roller.

Only one section of the grizzly is shown on the drawings. It is understood, however, that, as is usual in grizzly installations, a series of such sections may be used. The grooves in the first of such sections are deep, providing large openings, while those in succeeding sections are each shallower than in the section preceding. The material is thus graded by a battery of such sections.

While I have shown and described the invention as applied to a screen of the grizzly type, it is understood that this is by way of example only and that the invention in its broader aspect contemplates the provision of means for automatically removing material that may become lodged in the openings of the screen during its operation without moving or agitating the screen bed as a unit.

It is thought from the foregoing taken in connection with the accompanying drawings

that the construction and operation of my device will be apparent to those skilled in the art, and that various changes in size, shape, proportion and details of construction may be made without departing from the spirit and scope of the appended claims.

I claim as my invention:

1. In a screen, a frame, a plurality of rollers journaled in said frame, said rollers being provided with spiral grooves, the turn of said grooves adjacent each end of said roller shallowing until they merge with the periphery thereof, the grooves of one roller cooperating with the grooves of an adjacent roller to form screen openings, and means for rotating said rollers whereby material lodged in said groove may be forcibly ejected.

2. In a screen, a frame, a plurality of rollers journaled on said frame, said rollers having spiral grooves thereon, each groove extending in opposite directions from the center thereof, the turn adjacent each end of said roller gradually decreasing in depth at one end thereof, and means for rotating said rollers.

3. A grizzly comprising a frame, a plurality of rollers journaled in said frame, each roller having a spiral groove in its periphery extending in either direction from the center thereof, means for rotating said rollers in the same direction, and means including one shallowing turn of such spiral groove for ejecting material from said groove.

4. In a screen, an inclined frame, a plurality of rollers extending transversely to said frame and having their peripheries parallel and adjacent to each other, spiral grooves of substantially the same pitch extending about said rollers extending in opposite directions from the center thereof, the groove of one roller being arranged opposite to and cooperating with the grooves of adjacent rollers to form screen openings, means for rotating said rollers in the same direction and at the same speed, and means including a cylindrical section of the roller providing a path along which material rejected by the rollers may travel.

5. In a screen device, an inclined frame, a plurality of rollers in said frame extending transversely thereof, each roller being provided with a right and left groove, one turn of each groove gradually decreasing in depth and finally merging into the peripheral surface of the roller, and means for rotating said rollers in the same direction and at the same speed and in a direction to convey material riding over the same toward the bottom of the screen.

6. In a screening device, an inclined frame, a side member at each side of said frame, a plurality of rollers mounted in said frame, said rollers extending transversely of said frame in parallel relation and adjacent to each other, each of said rollers being provided with a plurality of alternating right and left spiral groove sections terminating in a shallow turn and in spaced relation from said side members, and means for rotating said rollers.

7. In a screening device, a frame, a plurality of rollers journaled in said frame, each roller being provided with a right and left spiral groove, a circular collar on said roller for separating said grooves, the ends of said grooves opposite said collar decreasing in depths and merging into the surface of said roller whereby the grooves of adjacent rollers will cooperate to form openings through said screen of different diameters.

8. In a grizzly, an inclined frame, a plurality of rollers in said frame, each roller being provided with a spiral groove extending about the same and terminating in a portion of gradually decreasing depth and merging in the periphery of said roller at a point adjacent to but spaced from the side of said screen, and means for rotating all of said rollers at the same rate of speed and in a direction to assist the material passing over said rollers in its descent along said screen.

9. In a grizzly, a frame, a plurality of grooved rollers mounted in said frame, the grooves of one roller cooperating with the grooves of an adjacent roller for forming screen openings, wedging means for automatically removing material becoming lodged in said openings, and means including an uninterrupted path along which the material thus ejected may travel.

10. In a screening device, a stationary frame, a screen bed having openings therein, means for supporting said screen bed on said frame and preventing said bed from moving longitudinally, laterally or vertically relative to said frame, rotative wedging means for automatically removing material that may become lodged in said openings during the operation of said screen, and means including an unobstructed path along which the material thus ejected may travel without mixing with the material to be sized.

11. In a screening device, a series of rollers, channels in said rollers cooperating to form screen openings, said channels comprising in part a shallowed section ultimately merging in the periphery of said roller, means for causing the coordinated rotation of said rollers whereby by the cooperation of two said shallowed sections oversize material may be ejected from the screen openings.

12. In a screening device, a frame, a plurality of rollers rotatably mounted on said frame, each roller being provided with a spiral groove for cooperating with a groove

of an adjacent roller to form openings through said screen, a cylindrical section on said roller, a shallowing end turn of said groove immediately adjacent said cylindrical section, said cylindrical section forming a path down which rejected oversize material may travel.

In testimony whereof I affix my signature.

MYRON A. KENDALL.