March 13, 1928. 1,662,575

C. HAYES

CONVEYER

Filed Nov. 30, 1926

Fig. 1.

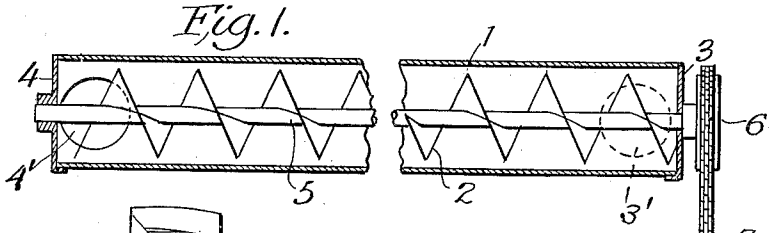


Fig. 3.

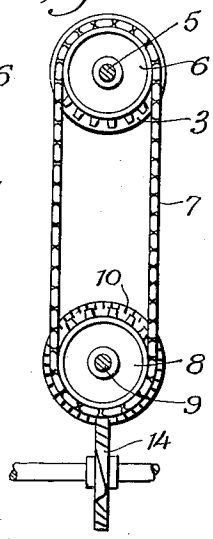


Fig. 5.

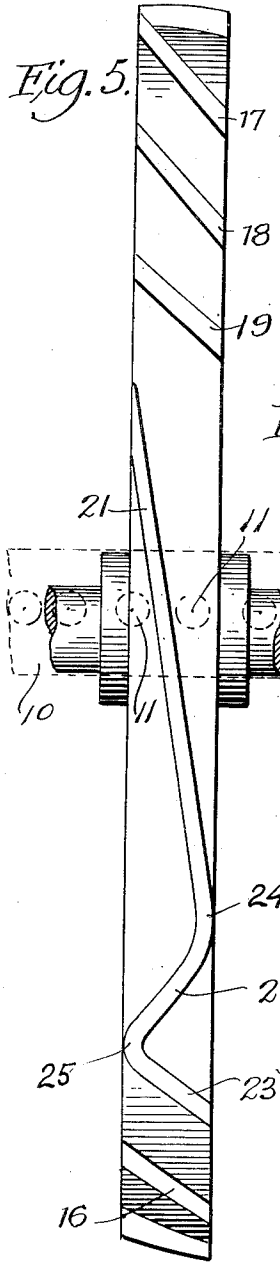


Fig. 2.

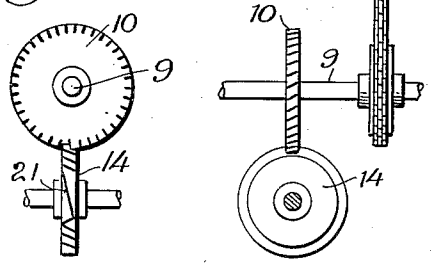
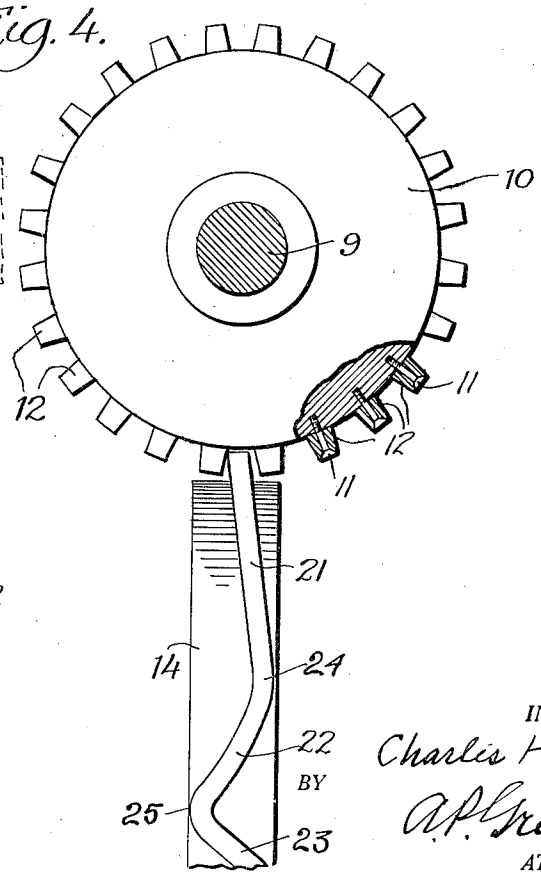


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CONVEYER.

Application filed November 30, 1926. Serial No. 151,804.

My invention relates to a conveyer for material subjected to heat in a retort and to the means for so operating the conveyer as to advance the material intermittently so as to afford better opportunity to extract volatiles than would be afforded by continuous feed.

With the object above indicated and other objects hereinafter explained in view my invention consists in the construction and combination of elements hereinafter described and claimed.

Referring to the drawings:

Figure 1 is a plan view of an apparatus embodying my invention.

Figure 2 is a detail view of the actuating gearing.

Figure 3 is an end view of the gearing shown in Figure 1.

Figure 4 is a view on an enlarged scale of the actuating gearing shown in Figure 2, and

Figure 5 is an edge view of the actuating gear.

In the drawings 1 indicates a retort in which carbonaceous material, such as bituminous coal, is to be subjected to heat to drive off volatiles as described in applications for Letters Patent of the United States, Serial No. 142,930, and Serial No. 142,931, filed by me October 20, 1926.

2 indicates a screw conveyer for moving the material treated from the inlet end 3 into which it is admitted through opening indicated by 3′ to the opening 4′ in discharge end 4 in accordance with the method described in the applications above referred to, and 5 indicates the shaft on which the flights of the conveyer are carried and extends through the inlet end of the retort being supported in suitable bearings, (not shown). On shaft 5 outside the end 3 of the retort is a sprocket wheel 6 connected by sprocket chain 7 to sprocket wheel 8 on shaft 9 which is so rotated by the device which forms the subject matter of this application as to cause the screw 2 to rotate for a definite number of turns in a direction to force the material being treated forward in the retort, that is, towards the discharge or outlet end 4, and then to rotate for one or more turns in the opposite direction so as to check the forward movement of the mass of material and move the following material away from that in advance of the flights of the screw and to thus open the mass of material to facilitate escape of volatiles.

The apparatus for effecting this purpose comprises a disc 10 having on its periphery radially extending pins 11, each provided with a roller 12, arranged in pairs so as to leave between the rollers of each pair a space sufficient to permit passage through this space of a fin on the periphery of a disc 14 on a power driven shaft 15.

This fin comprises a series of inclined members 16, 17, 18, and 19 arranged at an angle of about 45 degrees to the plane of the sides of the disc and a member between 19 and 16 consisting of a relatively long portion 21 extending from a point at the left of Fig. 5 opposite the end of 19 at an angle of about 22½ degrees to the sides of the disc, to near the opposite side, the right of Fig. 5, of the disc and thence extending towards the other side, the left of Fig. 5, as indicated at 22, from which it extends again to the opposite side of the disc, the right of Fig. 5, at an angle somewhat less than 45 degrees as indicated at 23. The portions 21 and 22 are so connected by a curved portion 24 that the reversal of the direction of rotation of disc 10 is effected gradually. The portions 22 and 23 are connected by curved portion 25 so that the reversal back to the original direction of rotation is effected without jar.

The retort being filled with the carbonaceous material to be treated, usually consisting of pulverized bituminous coal, supplied through opening 3′, and heat being applied to the retort, the screw conveyer 2 is rotated for a predetermined number of turns in a direction to move the material towards the discharge end 4, by the action of the fin portions 16, 17, 18 and 19 on the pins 11 of gear 10 from which the movement is conveyed by sprocket wheel 8, sprocket chain 7 and sprocket gear 6, to the shaft 5, the number of turns of the conveyer shaft depending upon the relative size of the gears 8 and 6. As the fin portion 19 passes out of contact with the pins 12 the fin portion 21 comes into action to cause the conveyer shaft 5, while still rotating in a direction to advance the material in the retort towards the outlet 4′, to rotate more slowly thus slowing the rate of advance of the material. As the curved fin portion 24 comes into action on a

pin 12 the rotation of the conveyer shaft stops and this stopping is followed by rotation in the opposite direction by the action of fin portion 22. This results in pressing back the material immediately in rear of the several flights and thus forming openings in the material to facilitate escape of volatiles driven off from the material by the heat to which the retort is subjected. As the curved fin portion 25 and fin portion 23 come into action the direction of rotation of the conveyer shaft 5 is again reversed back to its original direction and the advance of the material towards the discharge end is again resumed.

Having thus described my invention, what I claim is:

1. In combination with a screw conveyer, means for rotating the shaft of the conveyer a predetermined number of turns in a direction to advance the material acted on, reversing the direction of rotation of the conveyer for a less number of turns and again rotating the conveyer in a direction to advance the material.

2. In combination with a screw conveyer, means for rotating the shaft of the conveyer a predetermined number of turns at a relatively rapid speed in a direction to advance the material acted on, continuing the rotation at a relatively slow speed, reversing the direction of rotation for a limited number of turns and again rotating the conveyer in a direction to advance the material.

3. In combination with a screw conveyer, means for rotating the shaft of a conveyer a predetermined number of turns in a direction to advance the material acted on, reversing the direction of rotation of the conveyer for a less number of turns and again rotating the conveyer in a direction to advance the material comprising an actuating gear provided on its periphery with a plurality of fin portions inclined at an acute angle, and a single fin portion extending across the periphery of the actuating gear in a direction opposite to that of the plurality of fin portions.

4. In a combination with a screw conveyer. means for rotating the shaft of a conveyer a predetermined number of turns at a relatively rapid speed in a direction to advance the material acted on, continuing the rotation at a relatively slow speed, reversing the direction of rotation for a limited number of turns and again rotating the conveyer in a direction to advance the material comprising an actuating gear provided on its periphery with a plurality of successive fin portions inclined at a relatively acute angle, a fin portion extending across the periphery of the gear in the same direction as said successive fin portions but at a less angle, a fin portion extending across the periphery of the actuating gear in a direction opposite that of the successive fin portions.

In testimony whereof, I hereunto affix my signature.

CHAS. HAYES.