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E. McCARTHY

2,319,007

ROTARY CONVEYER

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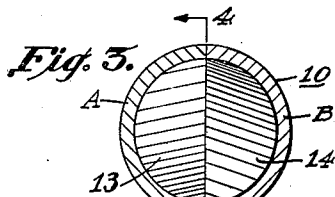
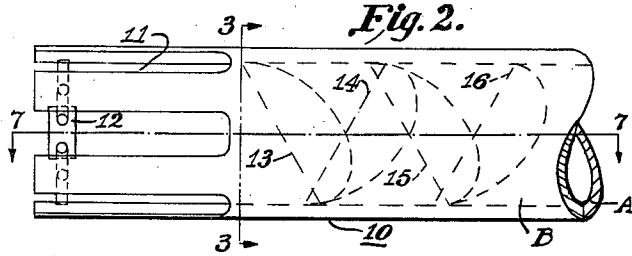
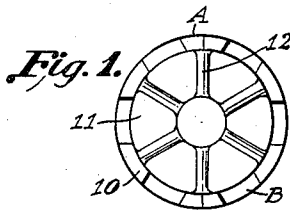


Fig. 4.

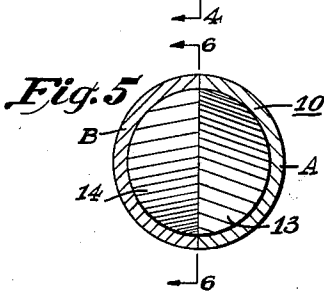
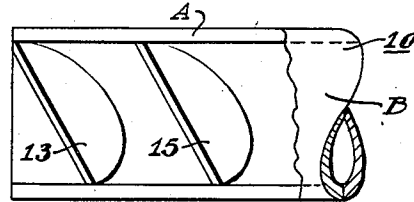
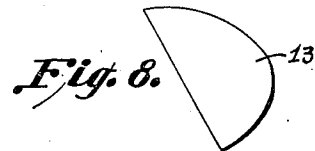
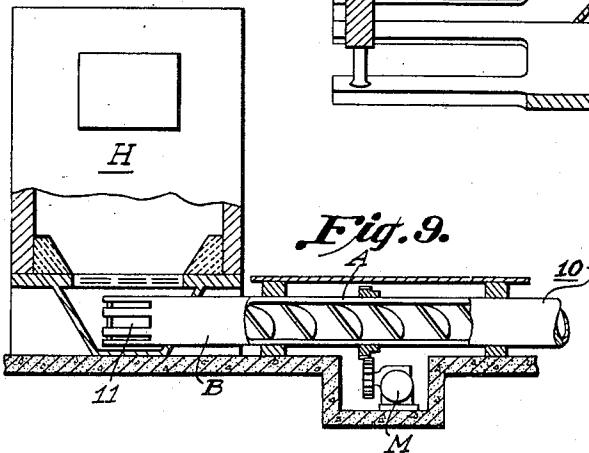
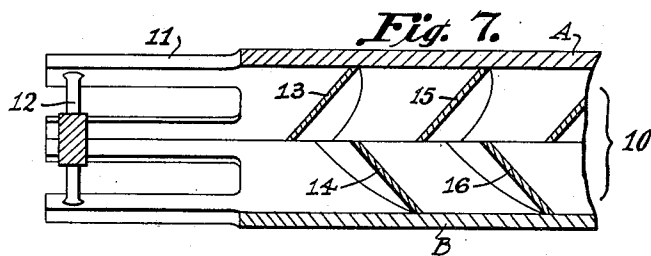
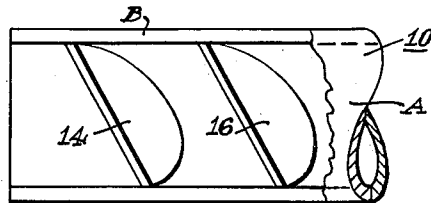


Fig. 6.



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UNITED STATES PATENT OFFICE

2,319,007

ROTARY CONVEYER

Edmund McCarthy, Brooklyn, N. Y.

Application June 29, 1940, Serial No. 343,072

2 Claims. (Cl. 198—215)

My invention relates to improvements in domestic heating plants and has more particular reference to a revolving tube conveyer for moving domestic stoker size coal or coke and the ashes or refuse from combustion of coal or coke in connection with the operation of domestic heaters where coal, coke, ashes or refuse are fed to the conveyer through longitudinal slots cut out in the form of a squirrel cage at the receiving end of a rigid, hollow cylindrical, metal tube having a series of fixed, inclined plane slides attached to the inner surface which engage the materials and cause them to move to the discharge end by the gravitating action set up when the tube is revolved about its longitudinal axis.

The primary object of my invention is to provide greater utility in the use of coal and coke as domestic heating fuels.

Another object of my invention is to provide in domestic heating plants a simple mechanical means of moving coal, coke, ashes and refuse, without creating excessive abrasive cutting action and frictional resistance due to movement of these materials within a conveyer tube.

A further object of my invention is to provide a conveyer of the hollow cylindrical rotary type with special interior slides to permit the use of a tube of sufficiently small inside diameter for practical application to domestic heating equipment and at the same time have ample conveying capacity and internal clearances to handle without obstruction the ragged and long irregular shaped pieces of coal, coke or clinker which may be admitted to the tube.

I attain these objects by combination and arrangement of the several parts illustrated in the accompanying drawings, in which—

Figure 1 is a view in elevation of the squirrel cage end of a conveyer embodying my invention;

Figure 2 is a side elevation view of part of a conveyer made according to the invention;

Figure 3 is a view in section on line 3—3, Figure 2;

Figure 4 is a partial sectional view taken on line 4—4, Figure 3;

Figure 5 is a view similar to Figure 3 showing the conveyer therein after it has been rotated through an angle of 180°;

Figure 6 is a partial sectional view taken on line 6—6, Figure 5;

Figure 7 is a view in section taken on line 7—7, Figure 2;

Figure 8 is a view in plan showing one of the conveyer slide elements; and

Figure 9 is a view partially in vertical section showing a conveyer embodying my invention associated with a hopper and mechanism for driving the conveyer.

Similar numerals refer to similar parts throughout the several views.

The numeral 10 designates generally the hollow cylindrical tube of the conveyer with the squirrel cage 11 and spider 12 provided with slots so that when the receiving end of the tube is projected into a hopper H containing materials to be conveyed (see Fig. 9), the materials pass through the slots, and as the tube is rotated about its longitudinal axis by any suitable means, a gravitating action is set up and the materials have a tendency to spread out and seek a common level within the squirrel cage and main section of the tube, with the result that the materials are engaged by slide 13 and caused to move downward and forward within the tube to slide 14 where they are again engaged and caused to move downward and forward to slide 15, then to slide 16 and so on to the discharge end of the tube.

Each of the slides is inclined in two directions: that is, the straight edges of the slides are inclined with respect to the longitudinal axis of the tube 10, and the plane surfaces of the slides are inclined to form acute angles between the faces of the slides and the longitudinal axis on the side of the slides toward the discharge end of the tube. More particularly, the several slides 13, 14, 15, 16, etc. are alternately arranged at opposite sides of a first plane through the longitudinal axis of the tube 10 with the inner edges of the slides disposed approximately in the said first plane and their body portions extending to the inner surface of said tube 10 entirely at one side of the first plane. Furthermore, the slide elements are inclined in the direction of a conveyance of the conveyer with their inner edges disposed at an acute angle with respect to a second plane through the axis of the tube 10 at right angles to the first plane, and the plane of the leading face of each slide is disposed at an acute angle with respect to the said first plane.

The squirrel cage 11 has a triple duty to perform in that it loosens the fuels and refuse and prevents the admission of pieces which are too chunky to clear the internal structure of the conveyer; breaks up pieces of friable fuels and refuse coming in contact with the slots; and prevents

excessive transverse pressure on the slides at the entrance end which might otherwise cause the fuels or refuse to pack and prevent normal flow.

Each slide is uniformly constructed of plane surface sheet metal and the general outline of the edges of each slide is that of a straight line joining the ends of a smooth curve. The curved edge of the slide conforms with the curvature of intersection of the slide with a one-half cylindrical section of the tube. The point where the curved edge of the slide meets the straight edge of the slide to form the lesser angle is hereinafter called the facing point of the slide, and the point where the curved edge of the slide meets the straight edge to form the greater angle is hereinafter called the trailing point of the slide.

In constructing my conveyer, I prefer to use a single piece of rigid, hollow cylindrical, metal tubing of any desired length; and as a ready means of securing the slides to the inner surfaces, I prefer to cut the tube through its longitudinal axis to form two semi-cylindrical sections A and B with edges parallel and in the same plane. To the inner surface of the semi-cylindrical section A, a series of equally spaced sheet metal, inclined plane slides 13, 15, etc., are welded or otherwise securely attached in fixed parallel relation with respect to each other, with the straight edges of the slides in the same or in approximately the same plane as the parallel edges of the semi-cylindrical section and inclined with the facing point toward the receiving end of the tube and trailing point toward the discharge end of the tube, and with the plane surface of each slide intersecting the inner surface of the semi-cylindrical section of the tube to produce an angle of inclination which is acute with respect to the longitudinal axis on the side of each slide toward the discharge end of the tube.

A similar series of slides 14, 16, etc., are welded or otherwise securely attached to the complementary semi-cylindrical section B and so arranged that when the two sections A and B are joined together by autogeneous welding or other means to form the smoothest and tightest possible joint obtainable, the trailing point of slide 13 will approximately coincide with the facing point of slide 14, and trailing point of slide 14 will approximately coincide with the facing point of slide 15, and so on with each successive slide throughout the length of the tube.

Suitable longitudinal slots of dimensions consistent with the material to be handled are then cut out at the receiving end of the tube to form the squirrel cage arrangement 11, and the spider

12 is welded or otherwise securely attached to the end of the squirrel cage.

The slides may be installed for either clockwise or counter-clockwise rotation of the tube which may be driven by any suitable means such as a motor M, but in either case, the direction of rotation is such that the straight edge leads the curved edge in rotation near the facing point of each slide.

While the preferred form of my invention has been herein shown and described, it is to be understood that minor changes may be made in details of construction and combination and arrangement of the several parts within the scope of the claims, without departing from the spirit of the invention.

I claim:

1. In a conveyer comprising a tubular casing and means for rotating said casing about its longitudinal axis, a plurality of imperforate flat conveyer elements disposed in said casing and alternately arranged at opposite sides of a first plane through the longitudinal axis thereof with the inner edges of said elements disposed approximately in said first plane and their body portions extending to the inner surface of the casing entirely at one side of the first plane, said elements being inclined in the direction of conveyance with their inner edges disposed at an acute angle with respect to a second plane through the axis of the casing at right angles to said first plane, and the plane of the leading face of said elements being disposed at an acute angle with respect to said first plane.

2. In a conveyer comprising a tubular casing and means for rotating said casing about its longitudinal axis, a plurality of imperforate flat conveyer elements disposed in said casing and alternately arranged at opposite sides of a first plane through the longitudinal axis thereof with the inner edges of said elements disposed approximately in said first plane and their body portions extending to the inner surface of the casing entirely at one side of the first plane, said elements being inclined in the direction of conveyance with their inner edges disposed at an acute angle with respect to a second plane through the axis of the casing at right angles to said first plane and with the trailing end of the inner edge of each element meeting the leading end of the inner edge of the preceding element, and the plane of the leading face of said elements being disposed at an acute angle with respect to said first plane.

EDMUND McCARTHY.