

A. D. FURSE.
DISINTEGRATING APPARATUS.
APPLICATION FILED JULY 15, 1907.

899,521.

Patented Sept. 29, 1908.

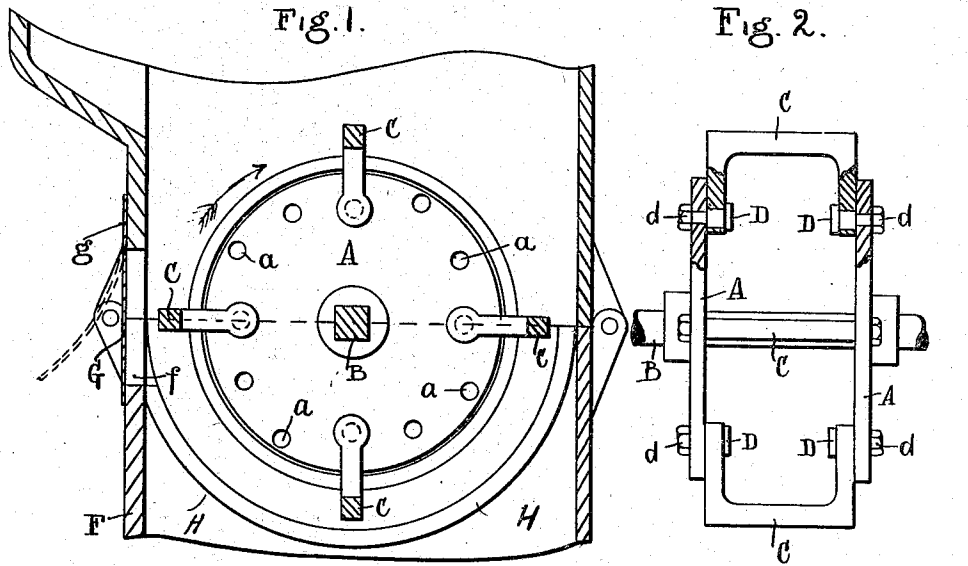


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

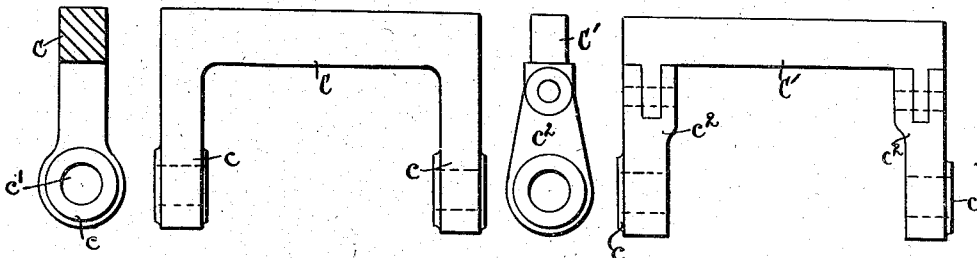
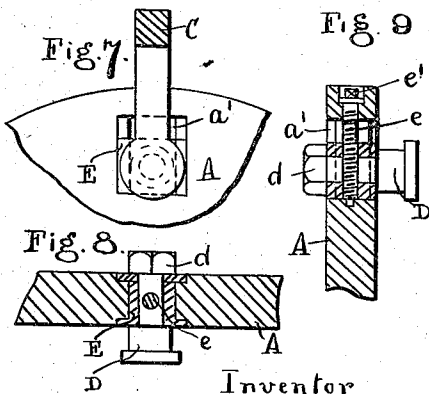
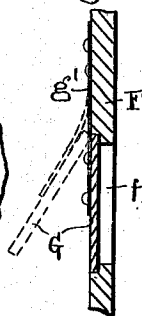
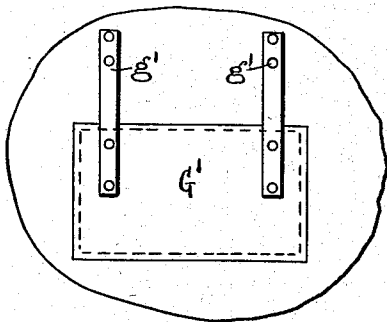


Fig. 10.

Fig. 11.



Witnesses

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UNITED STATES PATENT OFFICE.

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DISINTEGRATING APPARATUS.

No. 899,521.

Specification of Letters Patent.

Patented Sept. 29, 1908.

Application filed July 15, 1907. Serial No. 383,760½.

To all whom it may concern:

Be it known that I, ALBERT DONALD FURSE, a subject of the King of Great Britain and Ireland, residing at Southwark Engineering Works, Boundary Lane, Walworth Road, London, England, have invented certain new and useful Improvements in Disintegrating Apparatus, of which the following is a specification.

10 This invention relates to improvements in disintegrating apparatus of the type in which rotating beaters are placed within a casing receiving the materials to be disintegrated and the improvements relate to the construction and fitting of the beater bars and to means for allowing for the automatic discharge of obstructing materials such as pieces of metal which cannot be treated by the apparatus.

20 The apparatus is adapted for the treatment of the most various materials, such as unpicked house and other refuse, bones, mineral ores, furnace slag, clinker, limestone and such other substances as may require to be pulverized or disintegrated.

25 I employ beater bars of square C shape in elevation and built of one or more parts and place these entirely between two disks mounted on the main shaft, the beater bars having eyes at their ends through which bolts pass, the bolts also extending through the disks and being secured by nuts or like means. I may make the beater bars in separate parts hinged together, the bar proper being hinged at each end to arms which are in their turn secured to the disks. I also provide means for adjusting the beater bars in the disk to allow for wear or for any other purpose. To provide for the automatic ejection of obstructing materials treated by the said beaters I form the casing with an aperture in a convenient position and may place over the aperture a flexible door which gives sufficiently to allow any heavy material thrown against it to pass out of the machine but does not permit ordinary materials to escape.

50 In order that my invention may be more readily understood, reference is had to the accompanying sheet of drawings in which:—

Figure 1 shows the beater and part of the casing in section; Fig. 2 is an elevation of the beater with parts in section; Figs. 3 and 4 show a beater bar to a larger scale; Figs. 5 and 6 illustrate a modification; Figs. 7, 8 and 9 are detail views showing a method of ad-

justing the beater bars; and Figs. 10 and 11 illustrate a slightly modified arrangement of safety door.

In Figs. 1 and 2 the disks A are mounted 60 on the shaft B at a convenient distance apart and these disks are provided with the three sets of holes *a* at different distances from the periphery, these holes serving for securing the beater bars at different points. In the 65 illustration the four holes nearest the center are employed for this purpose. The beater bars C shown in detail in Figs. 3 and 4 are made in one piece and consist of a cross bar with two arms or end pieces slightly bossed 70 at *c* and provided with the holes *c'* to receive the bolts D as shown in Fig. 2. These bolts pass through the holes *a* as well as through the ends of the beater bars and they are secured in the arrangement shown by the nuts 75 *d*. In this arrangement the beater bars, being mounted on bolts or studs projecting inwardly from the disks, are not liable to break at the fulcrums as is the case with bars at present employed in apparatus of this type. 80 The bars may be made from a single piece or from two or more pieces united together in any suitable way.

Referring to Figs. 5 and 6 the beater bars instead of being made in the form of a rigid 85 bent rod are made of a straight bar C' pivoted at each end to the arms or side pieces C² which are then secured to the disks A in the manner already described. This arrangement gives greater freedom to the bars and 90 less liability to injury when meeting any heavy obstruction and allows them to be readily raised.

In Figs. 7, 8 and 9 is an arrangement for allowing the beater bars to be adjusted radially in the disks in connection with the method of mounting the bars already described. In this arrangement the bolts D pass through a sliding block E mounted in the radial slot *a'* of the disk A. The block E 100 is free to move up or down in this disk and its position is adjusted by the center pin *e* which passes through it and through the bolt D and can be turned from the end *e'* by means of a key. The position of the beater 105 bars can thus be readily adjusted so as to give the best effect to the apparatus.

Referring to the modification for automatic ejection of obstructing materials the casing F, within which the beater is placed, 110 is provided at *f* with an ejecting aperture, which aperture is placed in such a position

that the beater will throw any obstructing bodies through it. The position of this aperture is defined by the position of the screen H indicated in Fig. 1, through which the disintegrated materials pass. The rotation of the beater is shown by the arrow and it will be seen that the materials before disintegration fall on the beater bars at the side of the opening and are carried away from it. The disintegrated substances can pass through the screen H and are driven through it by the action of the beater, but refractory substances can drop down between the beater disks (if they are not carried completely round) and the following beater bars pick them up and throw them through the opening. It is essential that the materials capable of disintegration shall be carried along the greater part of a revolution before the aperture is reached and when this is done it is found, when dealing with some classes of materials, such as house and other refuse, that there is practically no discharge through *f* except that of refractory pieces. This aperture may be used without any covering but as shown in Fig. 1 it is covered by a flexible door G secured at *g* above the aperture. The door itself is of flexible and resilient material and forms a valve retaining the ordinary materials but allowing any heavy material, which may be thrown against it, to force it back and drop out of the apparatus.

In the modification shown in Figs. 10 and 11 the door G¹ is not itself flexible but is carried upon the flexible hinges or springs *g*¹ which allow it to be thrown back by any heavy body. The actual means employed for giving resiliency to the door, if one is used, may of course be varied, the essential feature being that the door forms a valve remaining closed during the ordinary operation of the machine and of sufficient strength to resist the impact of the usual materials but capable of opening when any exceptionally heavy object is thrown against it. The aperture is always placed in such a position, with regard to the beater, that objects meeting the beater bars and not readily broken up are thrown towards the aperture and consequently against the door. This arrangement enables the obstructions to be expelled without interfering with the usual exit of the materials to be disintegrated and

without stopping the machine or requiring any special attention from a workman.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In disintegrating apparatus two pierced disks separated by a clear space, horizontal beater bars having bent and perforated ends placed between the two disks and separate pins for each end of the bars, passing through the holes in the bars and disks and secured to each end to form pivots and leave the space within the bent beater bars and disks clear, substantially as herein described.

2. Beater bars for disintegrating apparatus consisting of a cross bar and two end arms pierced at their extremities for securing to the beater and hinges connecting the arms to the cross bar, leaving the latter free to turn at the arms, substantially as herein described.

3. In disintegrating apparatus, bent beater bars having pierced ends, supporting disks having radial slots, sliding blocks in the said slots, adjusting means for securing the sliding blocks and supporting pins for the beater bars passing through their extremities and through the sliding blocks, substantially as herein described.

4. In disintegrating apparatus, horizontal rotating beaters, and a casing containing the beaters having a discharge screen and an aperture for the discharge of refractory materials placed above and following the screen in such a position that the materials disintegrated are driven through the screen before they can reach the aperture, while the refractory materials are ejected by the beaters.

5. In disintegrating apparatus, horizontal rotating beaters, a casing containing the beaters, having a discharge screen and an aperture for the discharge of refractory materials placed above and following the screen, and a flexibly mounted door covering the said aperture and arranged to open only when a heavy object is thrown by the beaters against it, substantially as herein described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ALBERT DONALD FURSE.

Witnesses:

H. D. JAMESON,
F. L. RAND.