(No Model.)

E. K. RICHARDS.

Discharging Apparatus for Bone Black Furnaces.

No. 236,458. **Patented Jan. 11, 1881.**

Fig. 1.

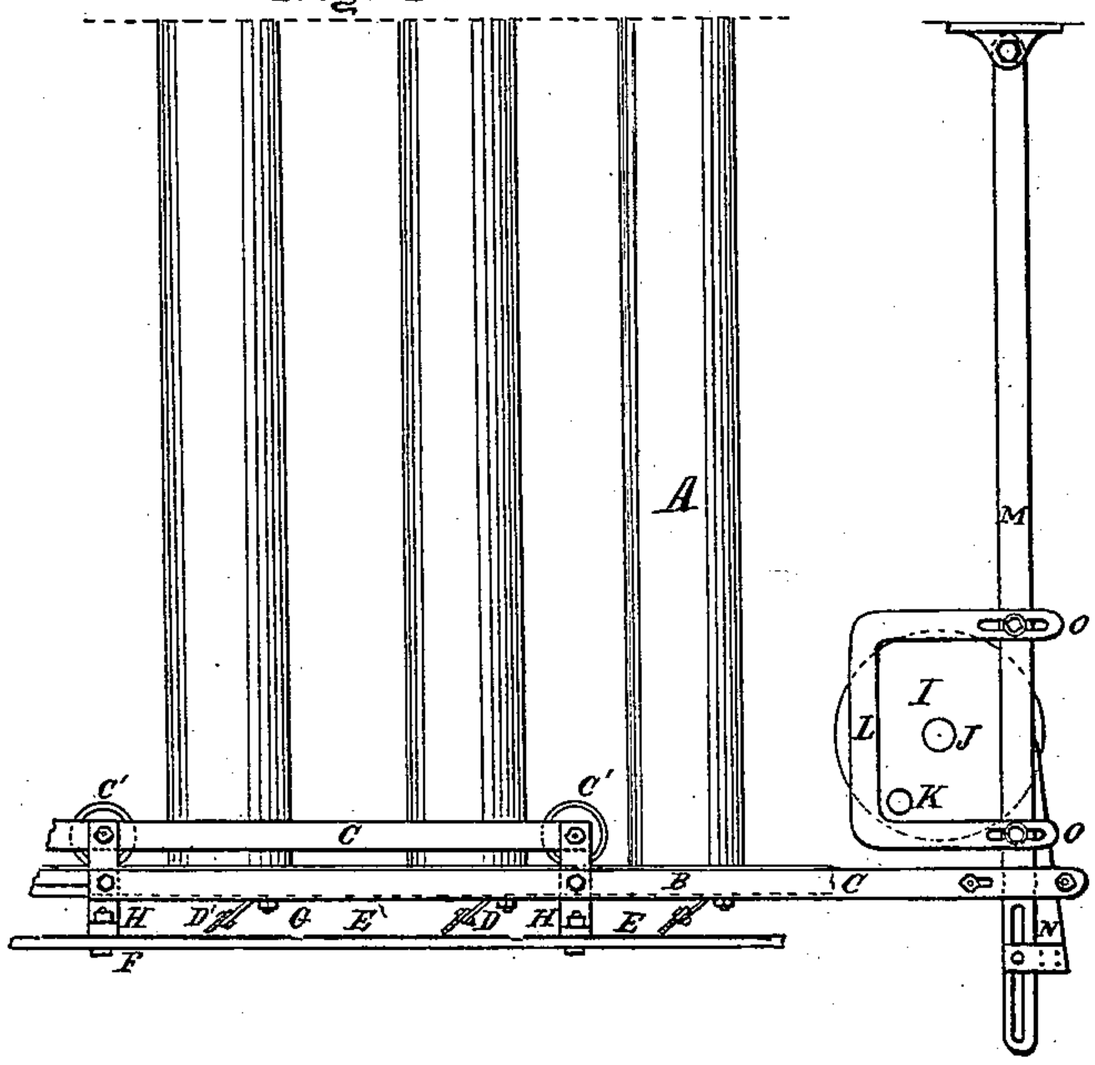


Fig. 3.

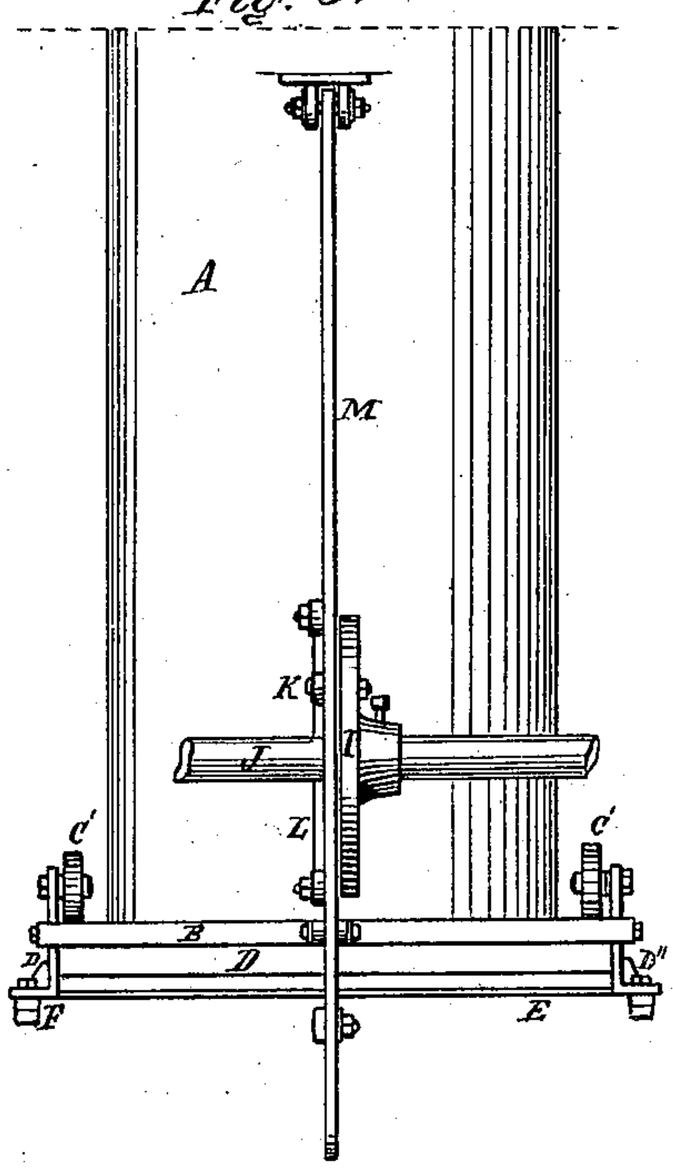
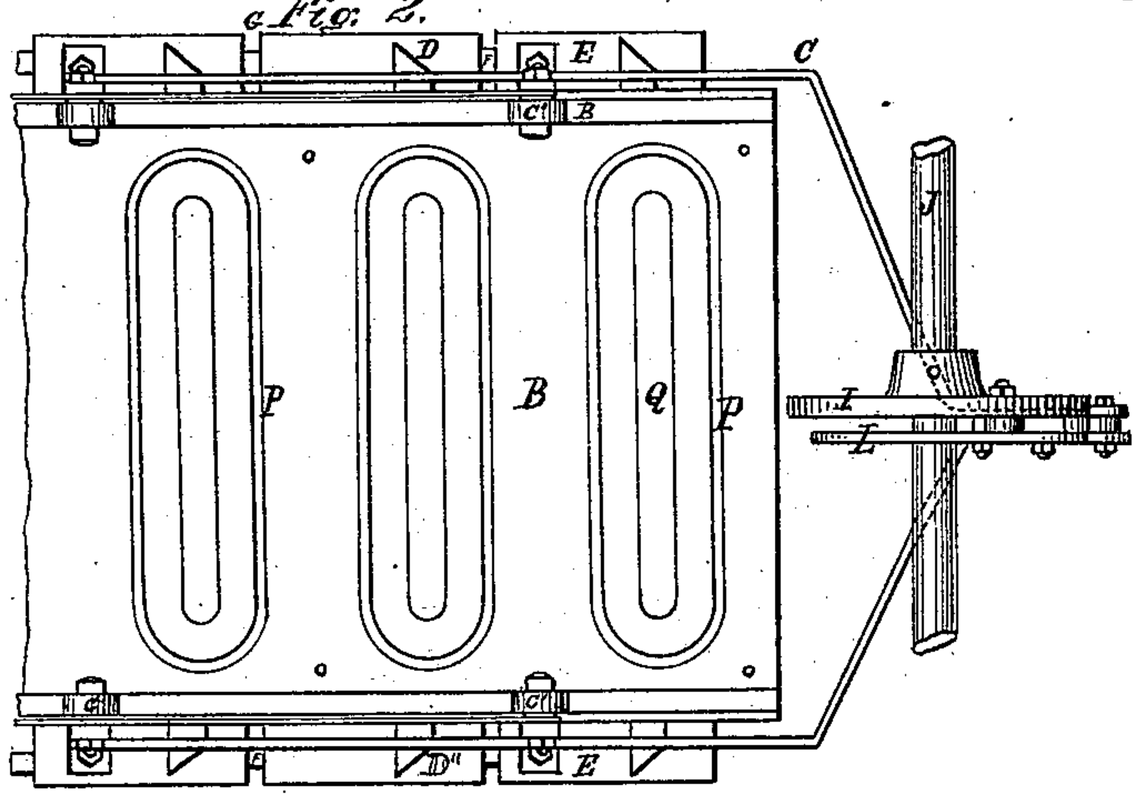


Fig. 2.



WITNESSES.

J. Thornton Callaghan.

S. Baldwin Chapman.

INVENTOR.

Edward K Richards.

Per S. J. McDougall.

Attorney.

UNITED STATES PATENT OFFICE.

EDWARD K. RICHARDS, OF BROOKLYN, NEW YORK.

DISCHARGING APPARATUS FOR BONE-BLACK FURNACES.

SPECIFICATION forming part of Letters Patent No. 236,458, dated January 11, 1881.

Application filed December 6, 1880. (No model.)

To all whom it may concern:

Be it known that I, EDWARD K. RICHARDS, of the city of Brooklyn, county of Kings, and State of New York, have invented an Improved Discharging Apparatus for Bone-Black Furnaces, of which the following is a specification.

This invention relates to that portion of a bone-black furnace which receives or measures the bone-black as it falls from the cooling-tubes; and it consists in the construction and arrangement of the reciprocating and adjustable discharging-plates, and also in the construction of the regulating and adjustable cam and skeleton-frame for operating the discharging-plates, by these means doing away with the measuring-boxes usually employed in such apparatus. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, showing the cooling-tubes, the skeleton-frame, the adjustable angle-plates, and the regulating-cam. Fig. 2 is a top view of the suspended plate under the cooling-tubes, showing the discharge-openings, and also a section of the frame, shafting, angle-plates, receiving-plate, cam, and cam-yoke. Fig. 3 is a side elevation of one of the cooling-tubes, showing a section of the suspended plate, the frame, and wheels, the adjustable angle-plates, the cam-wheel and yoke, the suspended lever and shafting.

The same letters represent the same parts in all the figures.

A, Fig. 1, is one of the cooling-tubes, which is constructed of thin metal and oval in form, as shown in Fig. 3.

B is a base or suspended plate on which the cooling-tubes rest, and is fully described in Fig. 2.

C is a reciprocating skeleton-frame. Motion is given to this frame by a cam-wheel, and it is suspended from the wheels C′, which move on the top of the base-plate B, near its outer edge, as shown in Figs. 1, 2, and 3.

D is an adjustable angle-plate, and it is attached to the frame C. This angle-plate is made of metal and is in two pieces, the upper piece being nearly a right angle, and with bolt-holes through it near the edge. The lower piece is flat and laps on the angle-piece, and it is arranged with slots, screw or bolt holes, and bolts, so as to adjust it to any distance above the bottom plate or any angle on the length, as shown at D′.

E E are plates to receive the bone-black as it falls from the cooling-tubes. These plates are made of metal, and extend across the width of the base-plate and a short distance outside of it and below it, and are connected together by the bar F. A space, G, is shown between the plates E. The plates E and bar F are held in position by the supports H. The object of the space G between the plates E is to discharge the bone-black through them into a receptacle below the discharging apparatus.

J is the shaft, (shown more fully in Figs. 2 and 3.)

I is a cam-wheel.

K is a pin near the edge of the cam-wheel.

L is a yoke on which the pin K acts. This yoke is nearly square inside, and is attached to the suspended adjustable lever M. The suspended lever M is attached to a beam or other suitable fixture by a movable joint, and passes down to and below the frame C, to which it is connected. The length of motion given to the frame C can be adjusted by the wedge N, attached to the lever M, and by the slots O in the yoke.

Fig. 2 is a top view of the suspended base-plate B, which is constructed of cast-iron, with oval beads cast on it, as shown at P, and with oval openings through it, as shown at Q. The object of these beads is to hold the cooling-tubes in position as they rest inside of the beads. The object of the oval openings is to discharge the bone-black from the cooling-tubes on the measuring-plates E. The base-plate B is held in position by bolts passing up to a frame or to the furnace above the cooling-tubes. The frame C is constructed of iron or other suitable material, and it is carried on both sides of the cooling-tubes, as shown in Figs. 2 and 3. The adjustable angle-plates D are attached to the frame C at both sides by bolts or other fastening. These plates extend a short distance outside of the base-plate B, as shown at D″, Figs. 2 and 3. The cam-wheel I is firmly keyed or fastened to the shaft J. Motion is given to the shaft J by a worm-gear or other suitable slow motion.

Fig. 3 is a side elevation of one of the cool-

ing-tubes, and shows the position of the shafting J, the cam-wheel I, the yoke L, the pin K, the lever M, the base-plate B, the carrier-wheels C′, the adjustable angle-plates D, the measuring-plates E, and the bar F, all previously described.

The advantages of my improvements over others in use are, that they can be constructed for much less, and they are not liable to become deranged or broken by hard substances, such as nails, clinkers, or gravel, wedging into the close-fitting joints, as is the case with all apparatus using measuring-boxes and having an upper and lower close-fitting joint. In my apparatus tight-fitting joints are unnecessary. The bone-black is allowed to fall through the opening Q in the base-plate down on the measuring-plate E, where it forms a cone by its own gravity. The amount in the cone depends on the distance the measuring-plate is from the bottom of the cooling-tube. Any portion of this cone can be carried forward and discharged through the opening G into a receiver below by adjusting the double angle-plates D, and by the length of motion given to the frame C by the regulating cam-wheel I, yoke L, and lever M.

In the drawings, three cooling-tubes, and three angle-plates, and three measuring-plates are shown. By extending the length of the frame C any number can be operated by the mechanism described.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The adjustable angle-plates D, in combination with the skeleton-frame C, substantially as described.

2. The regulating-yoke L, the suspended lever M, and the regulating-wedge N, in combination with the cam-wheel I and the reciprocating skeleton-frame C, substantially as described.

3. In a discharging apparatus for bone-black furnaces, the combination of the following elements: the cooling-tubes A, the suspended base-plate B, the reciprocating skeleton-frame C, the regulating cam-wheel I, the yoke L, the lever M, the wedge N, the adjustable angle-plates D, the measuring-plates E, the bars F, and supports H, substantially as described.

EDWARD K. RICHARDS.

Witnesses:
JAS. S. HALL,
S. T. MCDOUGALL.