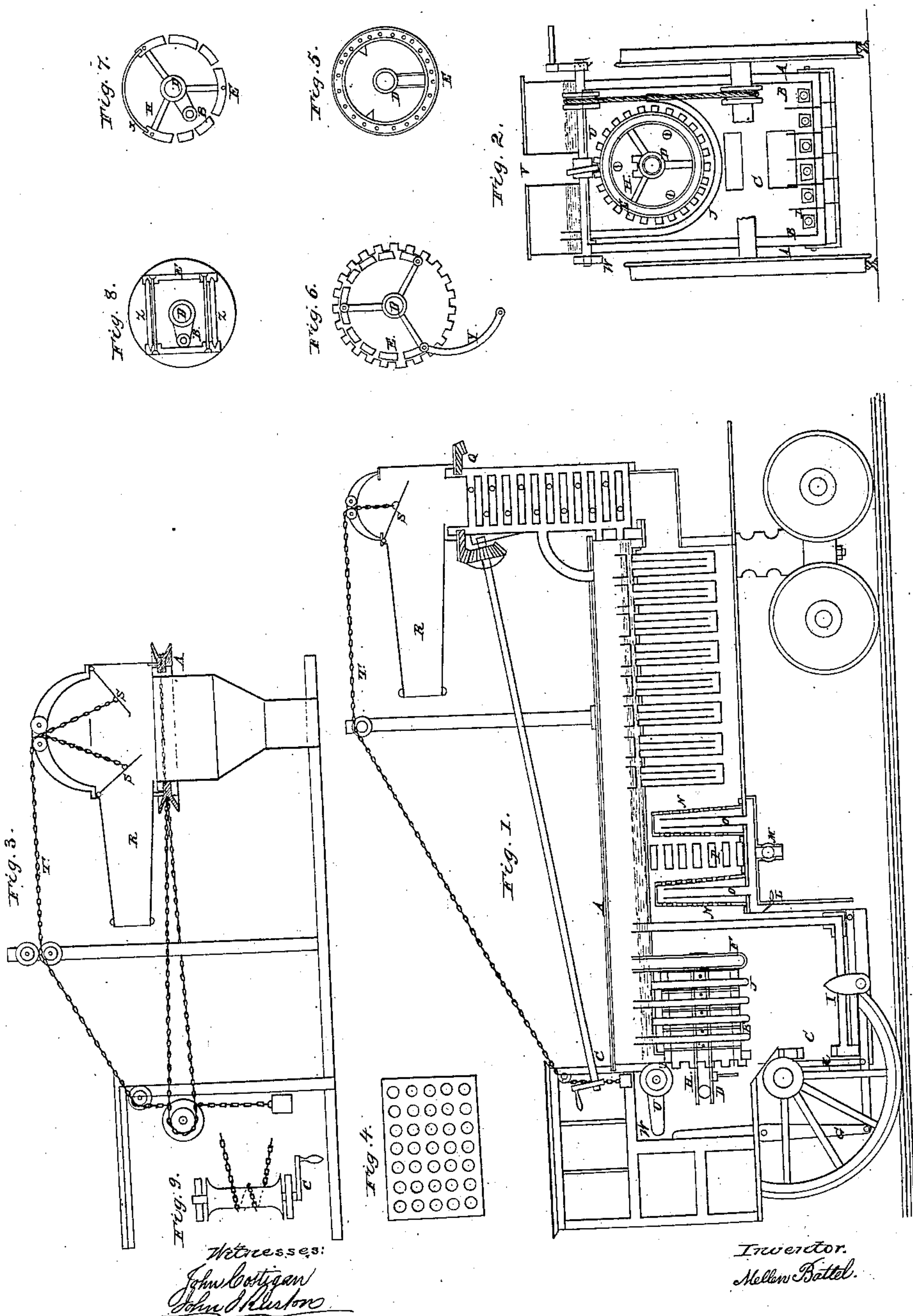


M. Battel,
Steam-Boiler Furnace,

Patented Sep. 18, 1860.

N.º 30,040.



UNITED STATES PATENT OFFICE.

MELLEN BATTEL, OF ALBANY, NEW YORK.

FURNACE.

Specification of Letters Patent No. 30,040, dated September 18, 1860.

To all whom it may concern:

Be it known that I, MELLEN BATTEL, of the city and county of Albany and State of New York, have invented a new and useful Improvement in the Mode of Constructing a Coking or Drying Cylinder for Coking and Burning Bituminous Coal, Bagasse, or other Damp Fuel; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a vertical section of my improved boiler on wheels, heretofore patented by me with my present improvement applied. Fig. 2 is an end view of the same, showing the end of the coking cylinder and endless screw, and gears, and pulleys, and band, connecting with the main shaft. Fig. 5 is a vertical section of one of the middle sections or views that forms the coking or drying cylinder, with one hollow arm to convey the air from the shaft to the rim, so as to commingle the air with the whole body of the coal, at the same time. As the cylinder revolves these sections are placed such a distance apart as the case may require, and held together by shaft and bolts. Fig. 6 is an end view of a coking or drying cylinder, opening by a door on one side, to receive the fuel from the top of the boiler or furnace. Openings are made to allow the gases to escape freely. Fig. 7 is an end view of a coking or drying cylinder, opening by a slide to receive the fuel from the top of the boiler, or furnace, or the end, as the case may be. Fig. 8 is an end view of a coking or drying box hung on a hollow shaft, perforated with holes, to admit the air to commingle with the coal as the box revolves, with a slide door to receive the fuel from the top of the boiler, or furnace. These coking cylinders, or boxes, may be moved by crank and endless screw, as shown at Fig. 2, or by crank, or clock-work, as the case may require.

Similar letters of reference, indicate corresponding parts, in the different views.

My invention consists in the employment, in the fire box, of a boiler, or other furnace, over or above the grate, a revolving cylinder, or box, for the purpose of coking bituminous coal, or drying other wet fuel. These cylinders may be made in various forms, according to the situation, and material that is used, and to open to receive the

fuel at the end, or side. They may be made open, so that the material may be sifted, on to the grate below, as it becomes dried or coked as the cylinder revolves; or it may be retained in the cylinder, or box, until it becomes coked, or dried, and then dumped into the grate below, by opening a door, drawing a bolt, or drawing a slide. These cylinders, or boxes, are hung on a hollow shaft, with holes perforated through the shaft, to allow the atmospheric air to pass into the cylinders and commingle with the coal as the cylinder revolves, and the coal becomes heated. Openings are left in the cylinder to allow the gases to escape freely. Between the bridge wall and these cylinders, I place a water leg, from the crown sheet of the furnace, to extend down as low as the lower edge of the coking cylinder, to protect it in a measure from the intense heat of the furnace, and to compel the smoke, and gases from the cylinder to pass down, in contact with the heated furnace below; and the back end of the shaft of the coking cylinder is held up by the water leg, by inserting a pipe through the leg, and if it should be necessary to further protect these cylinders from the heat of the furnace, water pipes may be thrown around them, as shown letter G. When these cylinders are used, without being directly in connection with a steam boiler, or with a brick fire box, the coking cylinder should be placed crosswise of the fire-box, so that the back end of the hollow shaft of the coking cylinder, will pass through the side of the fire box by a pipe. In that case, a leg of soap stone, or other fire proof material should take the place of the water leg.

To enable others skilled in the art, to make and use my invention, I will proceed to describe its construction and operation.

A, A, is the outside shell of the boiler.

B, is the inside shell or fire box.

C, is the fire box or furnace, wholly surrounded with water.

D, is the hollow shaft of the coking or drying cylinder perforated with holes, in its whole length, to convey air through the arm and rim, to commingle with the coal and gas as it revolves. It may be made open, to allow the materials to sift through when coked, or dried; or slides may be shoved in, to retain fine materials, till it is dried or coked, and then the slide be withdrawn.

E, is the out edge, or periphery of the

cylinder. These cylinders may be cast solid, excepting the door and ends, and air-holes; and either of the various forms may be used in the same furnace.

5 F, is the water leg, extending from the crown sheet of the boiler, or fire-box, to near the lower edge of the coking cylinder, and supporting the back end of the hollow shaft of the coking cylinder.

10 I, is the water pipes that protect the cylinder.

H, is the end door of the coking cylinder.

15 U, is the shaft, and pulley, and endless screw, and band, that moves the coking cylinder from the main shaft.

20 D, is the opening from the top of the furnace or boiler, to feed the coking cylinder, shown Fig. 2; W, the handle that raises the endless screw out of gear, to stop the cylinder at pleasure; X, the slide door as shown Fig. 7; Y, the door as shown Fig. 6; Z, the slide door as shown Fig. 8; b, the crank that turns the cylinder when not in motion.

After the fuel falls from the cylinder to the grate, I provide a vibrating fleam-tooth rake, that works between each grate-bar at the same time, with the teeth turned up, to facilitate the combustion of the fuel, and after the smoke, and gas, passes from the furnace, they pass into a combustion chamber, where I provide an atmospheric pillar formed of fire-clay, or black lead, to facilitate the combustion of the gases. In this pillar, I insert an iron air-tube extending to near the top of the pillar, to meet the light combustible gases. The smoke, and gases then pass through what I call a gas heater. The air that supplies these pillars, may be taken in hot from the back of the furnace L, or be taken in cold from the bottom of the combustion chamber, as shown letter M. After the smoke, and soot, or sparks, pass to the top of the smoke stack, I provide a director to prevent the soot, and sparks from coming in contact with the trains in the

rear; and when passing through a city or village, a valve closes the director, and opens the top, and lets the sparks out, in the ordinary way.

I, is the fleam-tooth rake; G, the arm that works the fleam-tooth rake. 50

K, is the rod that raises and lowers the rake.

L, is the valve that lets in the hot air; M, the cock that lets in the cold air; N, the gas pillar; O, the air-pipe inserted in the pillar; P, the gas heater shown at Fig. 4; Q, the bevel wheel that revolves with the director, moving in a groove on the top of the smoke pipe. 60

R, is the spark and soot director; S, the valve that closes and opens the director.

T, is the chain that lowers and raises the valve.

a is the shive, on the bottom of the director, moving in a groove, on the top of the smoke pipe. 65

C is the crank, and shaft, that the attendant revolves the director at pleasure.

I do not claim a coking oven, as now used; but 70

I claim—

A coking, or drying-cylinder, or box, hung on a hollow shaft, in the fire-box of a boiler, or other furnace, over, or above, the grate, the shaft being perforated with holes, to allow the atmosphere to pass in, by a cock or valve, to commingle with the coal and gases as the cylinder revolves; and if necessary to pass from the hollow shaft, through the arms, to the rim of the cylinder, and then pass out in jets, these cylinders to be revolved at pleasure, substantially as set forth for the purposes herein described, and made to operate. 75 80

MELLEN BATTEL.

In the presence of—

JOHN COSTIGAN,
JOHN BURTON.