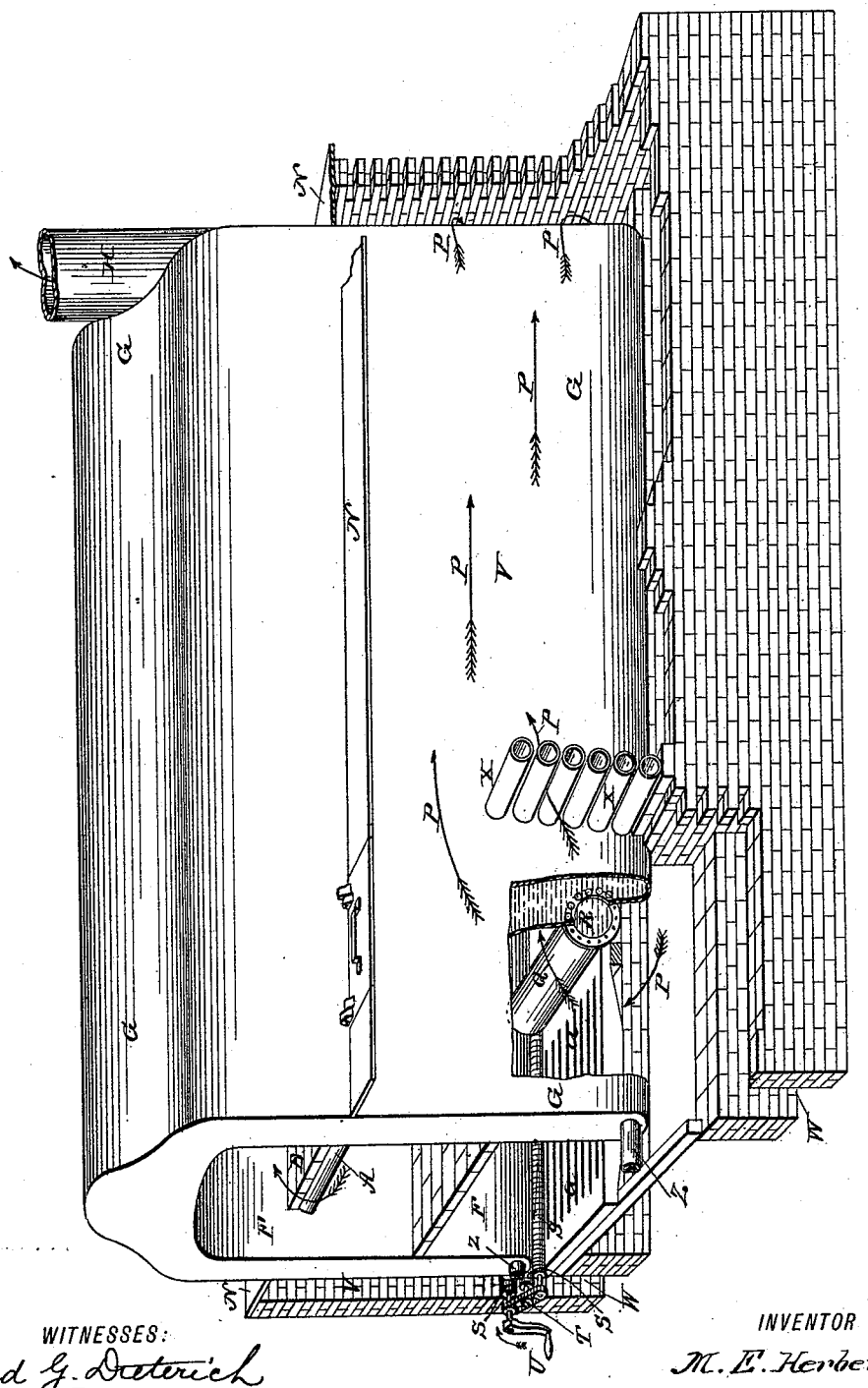
(No Model.)

M. E. HERBERT.

STEAM BOILER FURNACE.

No. 421,863. Patented Feb. 18, 1890.



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STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 421,863, dated February 18, 1890.

Application filed June 19, 1889. Serial No. 314,864. (No model.)

To all whom it may concern:

Be it known that I, MICHEAL E. HERBERT, of St. Joseph, in the county of Buchanan and State of Missouri, have invented a new and useful Improvement in Steam-Boiler Furnaces, of which the following is a specification.

The object of my invention is to provide an improved steam-boiler furnace which shall give great heating or steam capacity and shall secure an economy in the use of the fuel by burning the smoke and gases arising from the coal; and to this end it consists in the peculiar construction and arrangement of parts, which I will now proceed to describe with reference to the drawing, in which the figure is a perspective view of the furnace with the boiler set in place in the casing, the front wall and one of the side walls and also a part of the boiler being broken away to show the construction of the parts.

The form of boiler used is of the inverted-U-shaped pattern, forming a water-leg on each side extending the full length of the boiler, and constructed of an inner shell F and an outer shell G, connected together by stay-bolts *g*. The two legs of the boiler are connected together and braced by water-tubes A and C. This boiler is set within a brick casing. The lower parts of the side walls of the brick casing are made double, with a space between the two parts of the side wall, and the outer side walls extend up alongside the water-legs of the boiler and are covered with plates N, which form a closed chamber V all around the boiler. The front part of the chamber V is partially separated from the rear part by water-pipes X, tapped into the water-legs of the boiler, and this front chamber forms a fuel-magazine on each side of the boiler, which is charged with fuel through hinged doors O in the top plate N N. The inner brick side wall is a little lower at its front end, so as to leave a space beneath the water-leg on each side, communicating on one side with the fuel-magazine and on the other side with the fire-box of the furnace on a level with the grate-bars *a a*.

In the bottom of each fuel-magazine and extending under the outer leg of the boiler are a series of three fluted metal feed-rollers S, arranged side by side and having chain-pulleys at their ends connected by a chain belt T. A crank-handle U on one of these feed-rollers causes an equal rotary motion to be transmitted through the chain to all of the rollers, which serves to feed the fuel under the water-legs on each side of the boiler and onto the grate.

R is a water-drum, forming a bridge-wall at the back of the fire-box and communicating at its ends with the two water-legs of the boiler, which it connects and braces.

When the fire is started, the fuel is fed to the grate in regulated quantity from the bottoms of the magazine-chambers, and a uniform bed of live coals is thus maintained, which supplies a very intense heat to both sides of each water-leg and the drum R, giving great steaming capacity. At the same time that the solid fuel is being consumed on the grate-bars the gases and smoke arising from the lower part of the fuel-magazine (which receives air at W) pass up and over the water-tubes X, heating them, and, passing to the rear between the brick casing and outside of the water-legs, as shown by arrows P, serve to heat the outside of the boiler-shell, then, descending at the rear of the boiler, pass along the middle chamber to the ash-pit in front, and then, rising through the grate-bars, are burned by the bed of live coals, so as to fully utilize all the combustible parts of the fuel and perfectly consume the smoke.

At the bottom of each water-leg there is a pipe-connection Z for blowing off the boiler.

Having thus described my invention, what I claim as new is—

1. The combination, with a steam-boiler having water-legs upon each side, of an outer casing having fuel-magazines at its front ends communicating with the fire-box under the water-legs, and feed devices located at the bottoms of the fuel-magazines to feed the fuel to the grate while the gaseous products are separately carried off and consumed, as described.

2. The combination, with a steam-boiler having a central fire-box and water-legs on each side, of fuel-magazines arranged upon the outer side of each water-leg and opening at the bottom into the fire-box, and feed-rollers arranged at the bottom of the fuel-maga-

zines, substantially as and for the purpose described.

3. The combination, with a steam-boiler having water-legs upon each side with tubes X, of an outer casing having fuel-magazines at its front ends, feed-rollers S, located at the bottom of the fuel-magazines and geared together to feed into the fire-box, and a top plate N, with charging-doors O, substantially as and for the purpose described.

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