

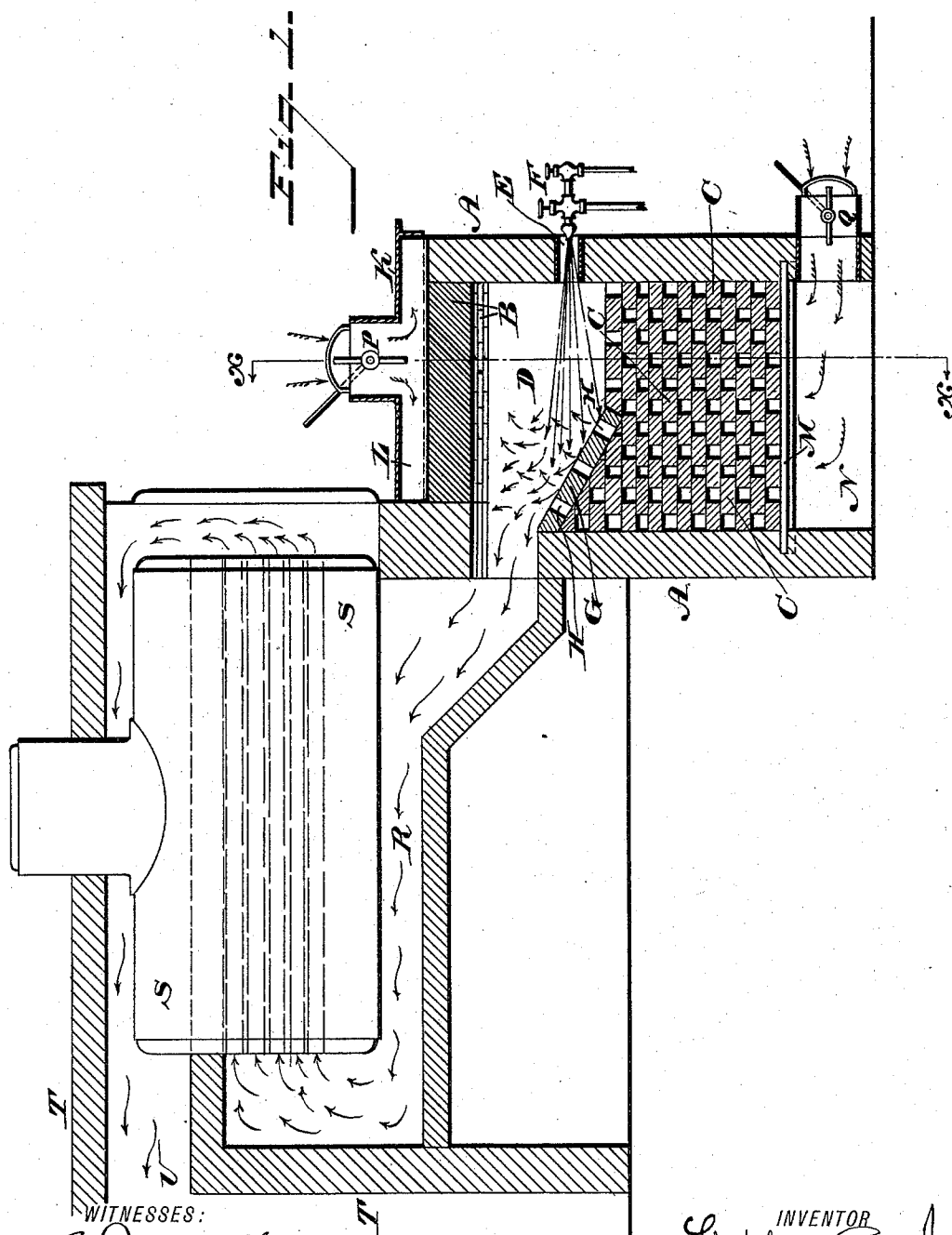
(No Model.)

2 Sheets—Sheet 1.

S. COX, Jr.
FURNACE FOR BURNING LIQUID FUEL.

No. 470,420.

Patented Mar. 8, 1892.



WITNESSES:

L. Douville,
P. H. Chagler.

INVENTOR
Stephen Cox, Jr.
BY *John D. Benken*
ATTORNEY.

(No Model.)

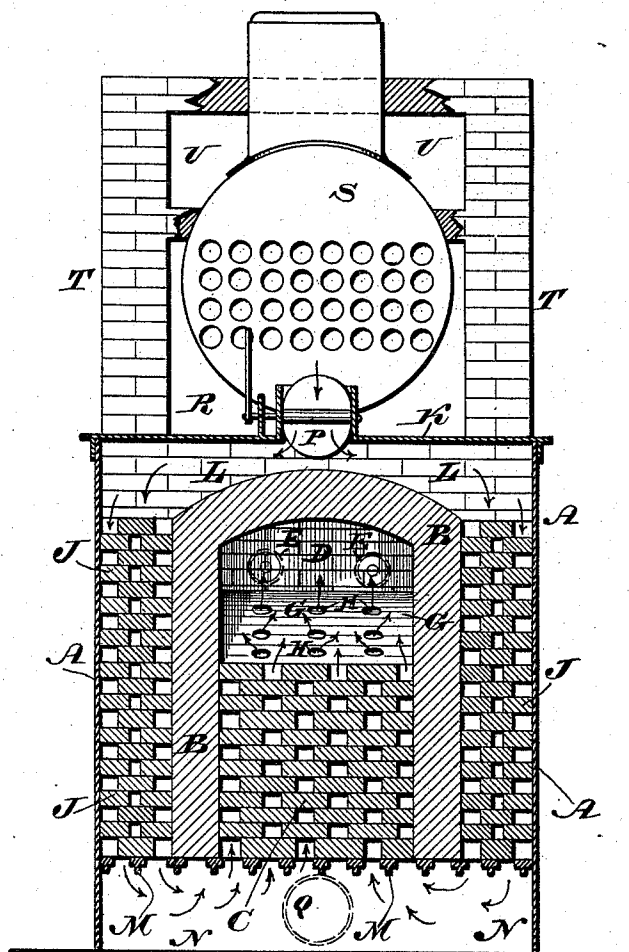
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Fig. 2.



WITNESSES:

L. Dowville,
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INVENTOR

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UNITED STATES PATENT OFFICE.

STEPHEN COX, JR., OF BRIDGETON, NEW JERSEY, ASSIGNOR TO COX & SONS
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FURNACE FOR BURNING LIQUID FUEL.

SPECIFICATION forming part of Letters Patent No. 470,420, dated March 8, 1892.

Application filed July 13, 1891. Serial No. 399,334. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN COX, Jr., a citizen of the United States, residing at Bridgeton, in the county of Cumberland, State of New Jersey, have invented a new and useful Improvement in Furnaces for Burning Liquid Fuel, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in furnaces for burning liquid fuel, and has for its object a device whereby an intense and uniform heat may be maintained at a comparatively low cost; and for this purpose it consists, first, of a perforated spraying-plate against which the jet of injected fuel is impelled.

It further consists of air-passages, with controlling valves therefor, surrounding the combustion-chamber, substantially as described.

It further consists of the combination and arrangement of parts, as hereinafter described.

Figure 1 represents a longitudinal section of a furnace embodying my invention. Fig. 2 represents a vertical section on line *xx*, Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

Referring to the drawings, A designates the outer casing of the furnace, and B an inner wall or casing having an arched top. Within the inner wall B is the checker or open work C, formed of fire-brick or other suitable material and having above it the combustion-chamber D. In the front wall of the casing A are the openings E, through which the jet of liquid fuel is injected from the nozzle of the atomizer F, the latter being of any well-known or usual construction. On the checker-work C and opposite the openings E is an inclined spray-plate G, against which the jet of liquid comes in contact. The spray-plate G is provided with the perforations H for the passage of air through the same. Between the side walls of the casings A and B are the checker-works J, and at a short distance above the arched top of the casing B and on the top of the walls of the casing A is a covering-plate K, whereby a chamber L is formed above said arched top. The inner walls B and checker-works C and J, with the perforated spray-plate

G, are supported by the bearer-bars M, which are secured to the casing A above the lower end thereof, so as to form a chamber N within the said casing below the said bars. The chambers L and N are provided with the air-valves P and Q, respectively. Leading from the chamber D is a passage-way R for the products of combustion, which pass through and around the tubular boiler S, which is entirely surrounded by a casing or wall T, having an opening U for the escape of the said products of combustion to a stack.

The manner of operation of the device is as follows: The fuel is admitted under pressure, either alone or with steam or air, from the atomizer F through the openings E in the casing and is dashed against the spray-plate G, where it is broken into minute particles and ignited. Air is admitted through the valve Q and passes up through the bars M, the checker-work C, and the perforated plate G to the combustion-chamber B, gradually heating the crown and side walls of the casing B and the interior and exterior checker-works C and J until said parts are intensely heated, when the valve Q is closed and the valve P is opened, whereby a current of air passes into the chamber L and, dividing, passes down each side of the arched top of the casing through the checker-works J and bars M into the chamber N and from thence up through the highly-heated checker-work C and perforated plate G into the chamber B, where it mingles in a highly-heated state with the minute particles of oil or other liquid fuel, thereby producing a very high and a perfect state of combustion. The products of combustion or heated gases pass from the combustion-chamber through the passages R, through and around the boiler, highly and uniformly heating the same, then escaping from the opening or outlet U to a stack.

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

1. A furnace having inner and outer casings, checker-work in said casings, air-chambers with valves therein above and below said checker-work, an opening in the front wall of the casings, leading into said inner casing, a spray-plate on said checker opposite said

opening, and means for injecting fuel through said opening on said plate, said parts being combined substantially as described.

2. A furnace having an outer casing with
5 openings, an inner wall or casing, checker-work in said inner casing, checker-work between the side walls of said inner and outer casings, and bearer-bars having suitable supports above the lower ends of said outer casing, said inner wall and checker-works being
10 supported on said bearer-bars, said parts being combined substantially as described.

3. A furnace having outer and inner casings, air-chambers within said outer casings
15 above and below said inner casing, provided with inlet-valves, checker-work between the inner and outer casings and within said inner

casing, and communicating passages between said air-chambers, said parts being combined substantially as described. 20

4. A furnace having an outer casing, an inner casing having an arched top, bars supporting said inner casing above the lower end of the outer casing, a spray-plate and a combustion-chamber within said inner casing, and
25 air-chambers with inlet-valves within said outer casing above and below said inner casing, said air-chambers having communicating passages, said parts being combined substantially as described.

STEPHEN COX, JR.

Witnesses:

JOHN A. WIEDERSHEIM,
A. P. JENNINGS.