No. 756,933. PATENTED APR. 12, 1904.

R. R. BRYANT.

SMOKE CONSUMER.

APPLICATION FILED JUNE 24, 1903.

NO MODEL.

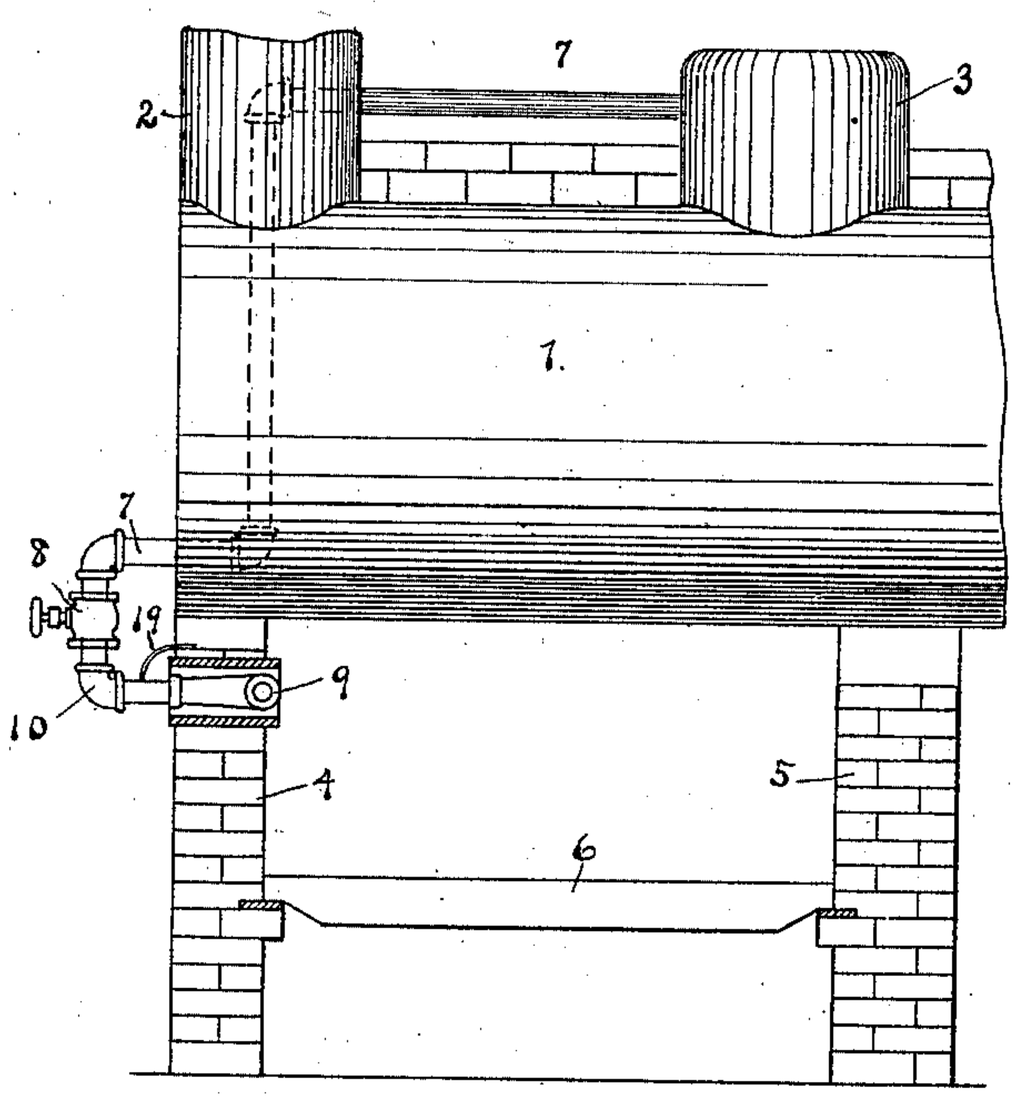

Fig. 1.

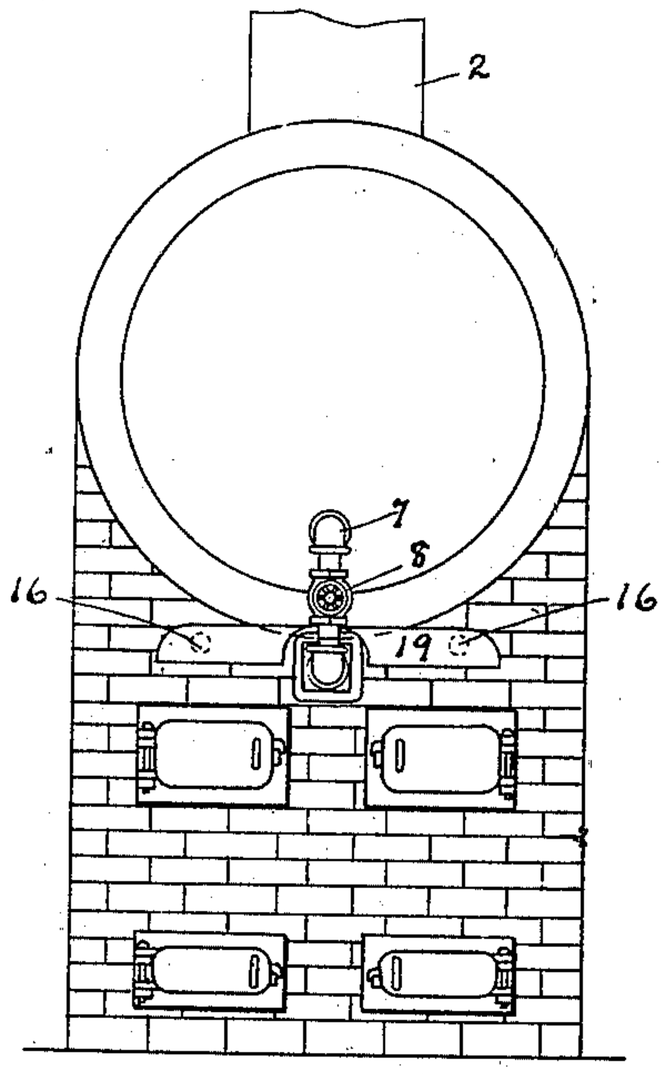

Fig. 2.

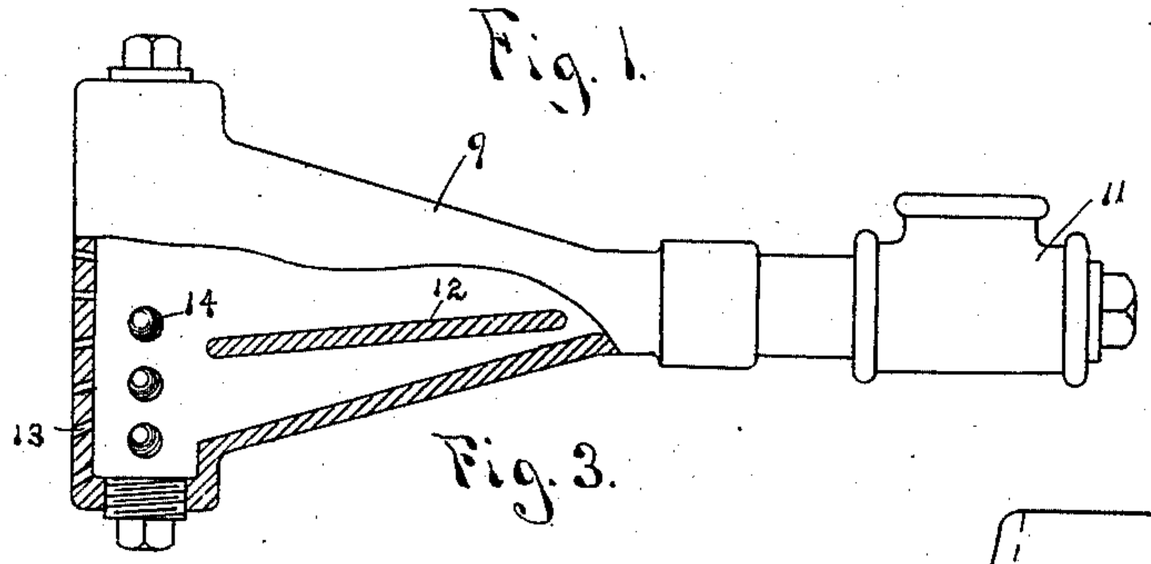

Fig. 3.

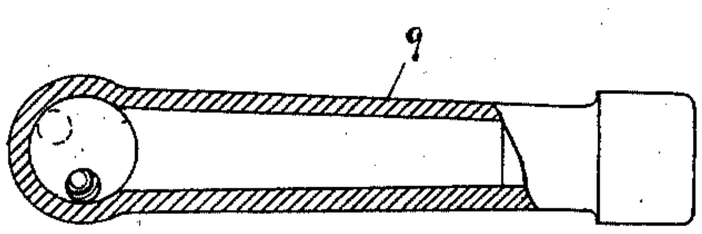

Fig. 4.

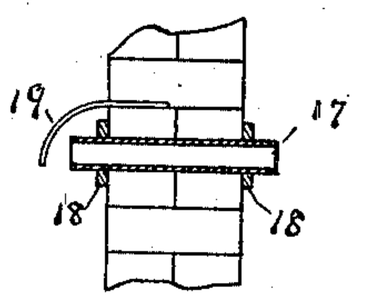

Fig. 5.

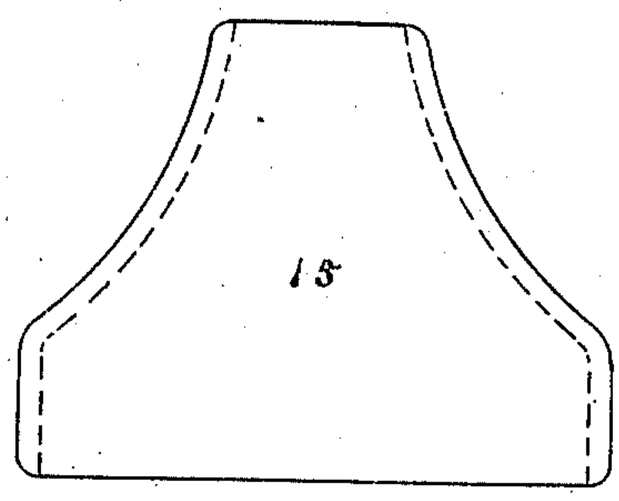

Fig. 6.

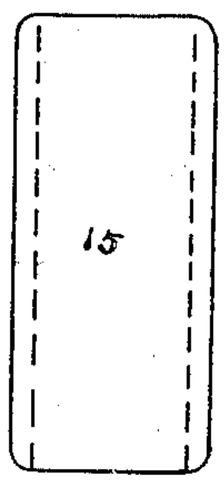

Fig. 7.

Witnesses.

Frank T. F. Stephenson.

Francis C. Osborn

Inventor.

Reuben R. Bryant.

by Edward N. Pagelsen.

his Attorney.

No. 756,933. Patented April 12, 1904.

UNITED STATES PATENT OFFICE.

REUBEN R. BRYANT, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO GEORGE W. CORNS, OF DETROIT, MICHIGAN.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 756,933, dated April 12, 1904.

Application filed June 24, 1903. Serial No. 162,881. (No model.)

To all whom it may concern:

Be it known that I, REUBEN R. BRYANT, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Smoke-Consumer, of which the following is a specification.

My invention relates to improvements in smoke-consumers; and the object of my improvements is to introduce a supply of oxygen into the furnace of a boiler in such a manner and in such quantities that the unburned carbon of the fuel and the gases will be burned. This process is usually termed "smoke consuming," when in reality it is the prevention of the formation of smoke. I attain this object by the means shown in the accompanying drawings, in which—

Figure 1 is a general cross-section of a boiler-furnace. Fig. 2 is a front view of the same. Figs. 3 and 4 are two views of the injector. Fig. 5 is a detail of the hood. Figs. 6 and 7 are views of the injector-sleeve.

Similar reference characters refer to like parts throughout the several views.

The boiler 1, with stack 2 and dome 3, rests on the front wall 4. The fire-wall 5 deflects the flame from the fuel on the grate 6 upward. A steam-pipe 7 extends from the dome into the stack, thence downward through the smoke-box, and outward, as shown. This pipe is supplied with the regulating-valve 8 and projects through the opening in the front wall. Instead of the elbow 10 of Fig. 1 a T 11 may be used and a steam-pipe from an auxiliary boiler attached in place of the plug, thus preventing the black smoke so often encountered when steam is being raised. This injector is hollow, tapering, and has a semicylindrical discharge end pierced with diverging holes, as shown. Inside of the injector are the walls 12, which split up the discharge of the steam, which as its passes out of the holes 13 is fan-shaped. Balls 14 are placed in this cylindrical end of the injector, and their rapid movements under the action of the escaping steam breaks up the current of the steam, often closing one or the other of the holes 13 for an instant, and also prevent any impurities, such as rust and scale, from clogging the holes 13.

A sleeve 15 incases the injector, as shown in Fig. 1. When the steam issues from the holes 13, it carries with it a strong current of air which is forced into the flame under the boiler. The sleeve serves to support the brick over the injector, acts as a guide for the injected air, and prevents the heat of the brickwork from injuriously affecting the injector. The injector will become quite hot notwithstanding—sufficiently so to superheat the steam—a very desirable effect. Supplementary to this injector I provide openings 16 in the front wall, into which I place pipes 17, provided with jam-nuts 18 to hold the pipes in place. A hood 19 extends over the outer openings of the pipes, preventing the entrance of dust that would clog these openings, and also acting as a guide for the ascending air from the furnace-door, the air that passes into these openings being therefore of higher temperature than the outside air. The size of the injector and the amount of steam used must be determined by the size of the furnace and the quality of the coal used. Instead of a brick front wall the well-known cast-iron fire-front may be used. The change in the construction of the injector necessitated in this manner is such as can be made by any skilled mechanic.

Having now explained my improvement, what I claim as my invention, and desire to secure by Letters Patent, is—

1. A smoke-consuming device comprising a cylindrical chamber, located adjacent to the fire-box of the boiler and connected therewith, and provided at its inner face with apertures adapted to be opened and closed by means of movable balls, said chamber having integrally formed on its rear portion a superheating-chamber, terminating in a sleeve to form a pipe connection.

2. A smoke-consumer comprising a cylindrical chamber provided with apertures on its inner portion, independently-moving bodies within said chamber adapted to open and close said apertures, a superheating-chamber formed integral with said cylindrical chamber

and provided with partitions, said superheating-chamber terminating in a sleeve adapted to form a pipe connection whereby said cylindrical chamber is connected with the steam-dome of the boiler.

3. A device for the purpose set forth, consisting of a cylindrical chamber closed at its ends and having a series of diverging apertures through its front wall, a plurality of movable bodies adapted to operate against the curved wall of said chamber, said chamber having a superheating-box formed integral therewith and extending therefrom, and means on said box for connecting with a steam source.

4. In a boiler-front having a series of apertures connected with a combustion-chamber, an injector in one of said openings having a series of diverging holes in its inner face, a series of balls in said injector for the purpose of breaking the stream of steam as it passes from said holes, a sleeve in said opening inclosing said injector, said sleeve serving to prevent the heat of the wall of the combustion-chamber affecting the injector injuriously.

5. A smoke-consumer comprising a cylindrical chamber provided with apertures on its inner portion and a tapering superheating-chamber formed integral with the cylindrical portion having partitions.

6. In a smoke-consumer, the combination of a cylindrical chamber provided with diverging apertures on its inner portion, a tapering superheating-chamber formed integral with the cylindrical portion, having partitions, and a tapering sleeve surrounding said cylindrical and taper part.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

REUBEN R. BRYANT.

Witnesses:
JOHN H. RUSSELL,
J. H. DOUGHERTY.