No. 815,512. PATENTED MAR. 20, 1906.

W. E. COLE.

FUEL ECONOMIZER.

APPLICATION FILED SEPT. 1, 1904.

Fig. 1.

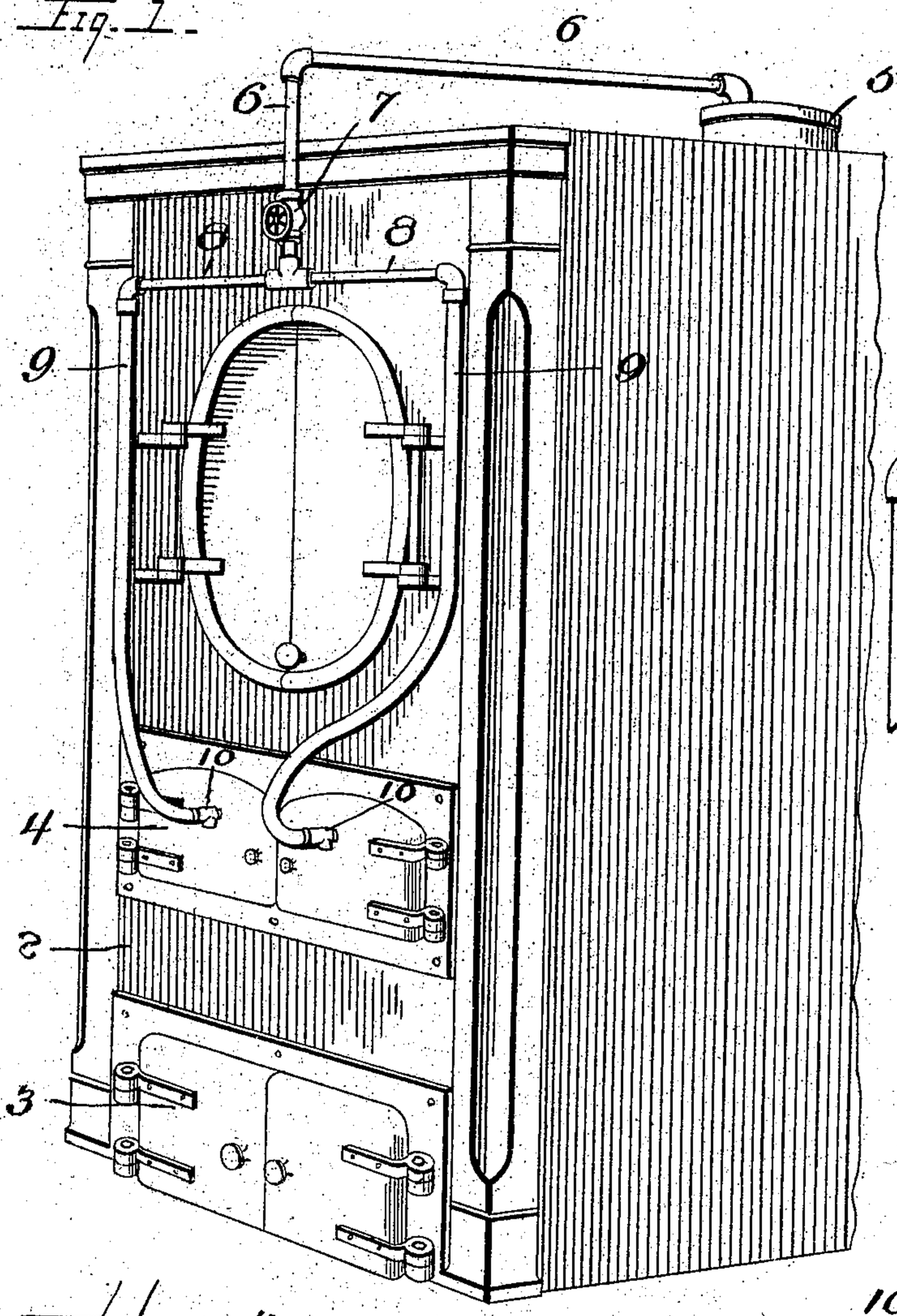


Fig. 5.

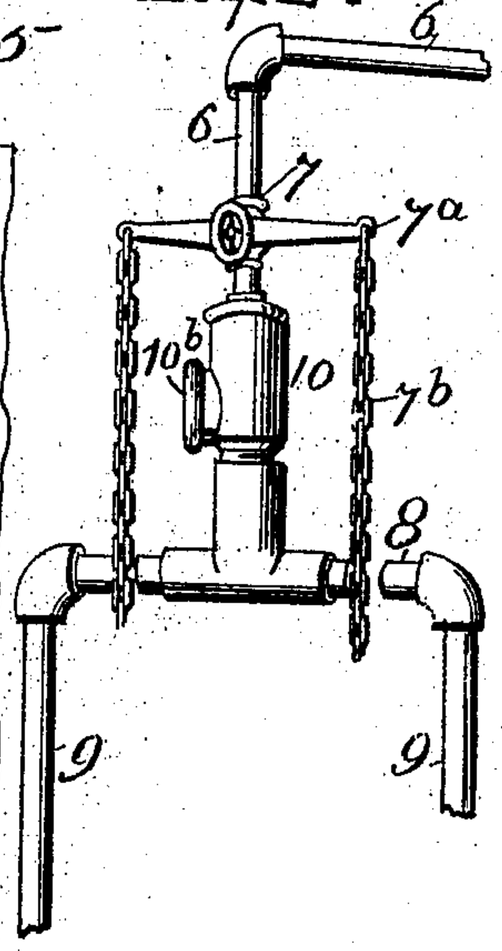


Fig. 2.

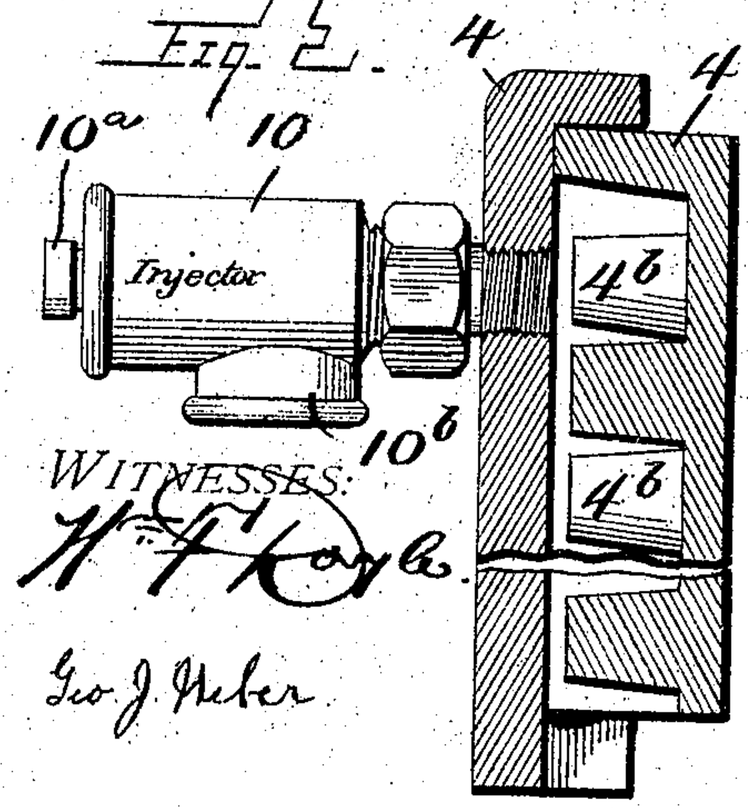


Fig. 3.

Fig. 6.

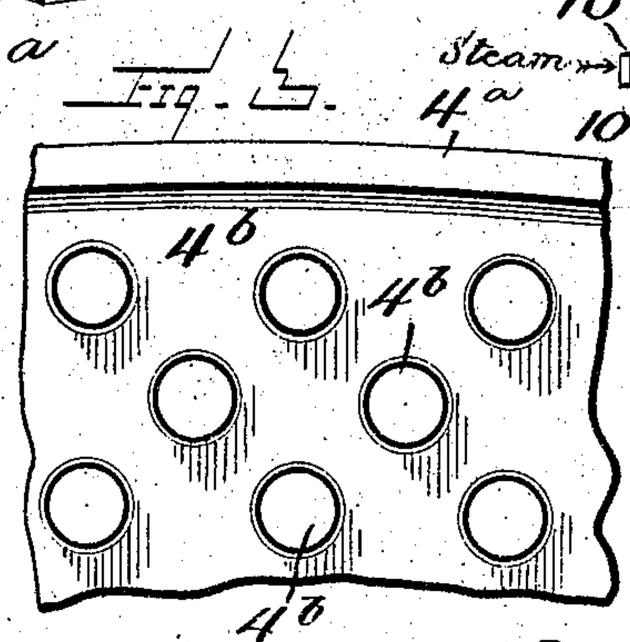
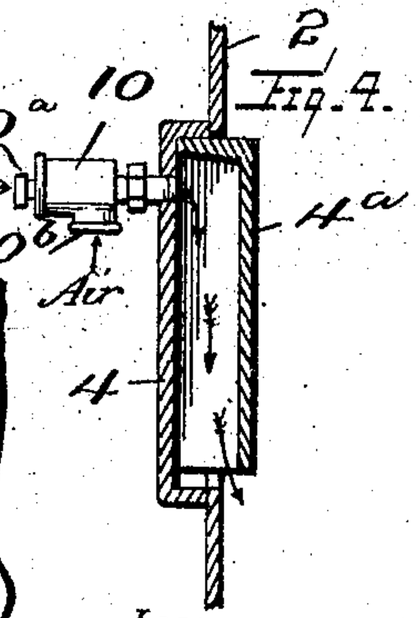


Fig. 4.



WITNESSES:

W. F. Hoyt

Geo. J. Huber

INVENTOR

Wm. E. Cole

BY E. E. Masson

Attorney

UNITED STATES PATENT OFFICE.

WILLIAM E. COLE, OF NORFOLK, VIRGINIA.

FUEL-ECONOMIZER.

No. 815,512. Specification of Letters Patent. Patented March 20, 1906.

Application filed September 1, 1904. Serial No. 223,015.

To all whom it may concern:

Be it known that I, WILLIAM E. COLE, a citizen of the United States, residing at Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Fuel-Economizers, of which the following is a specification.

This invention relates to steam-boiler furnaces and the doors thereof; and the objects of my invention are to provide simple and inexpensive means to economize fuel burned in said furnaces and improve its combustion by means of hot air or hot air and steam forced through the door into the furnace through an injector and a flexible connection attached to the source of supply and to the door. I attain these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a boiler-furnace having its doors provided with injectors and flexible connections leading from the steam-pressure supply in accordance with my invention. Fig. 2 is a side view of an injector secured to a portion of the fire-door shown with its lining inner plate in section. Fig. 3 is a front view of a portion of the lining of the fire-door. Fig. 4 is a vertical section of the fire-door carrying the injector and its inner plate. Fig. 5 is a modification in which the injector is placed close to the regulating-valve of the device.

In said drawings the numeral 2 indicates the front plate of the furnace, to which are hinged the ash-pit doors 3 and the fire-doors 5. The steam-dome of the boiler is shown at 5, from which issues the steam-pipe 6, having thereon a closing-valve 7. On the vertical portion of the pipe 6 below the valve 7 there are two branch pipes 8, having on their ends an elbow and a pendent flexible pipe 9, preferably of rubber. The lower end of said pipe is secured to a suitable injector 10 by means of its end nipple 10^a, said injector having on one side a leading-in passage 10^b for the entrance of air. The tubular inner end of the injector is screw-threaded and made to enter the fire-door 4, which is recessed and carries an inner plate 4^a, suitably bolted or otherwise secured to the fire-door 4. The plate 4^a has a flange on the top and sides, but is flangeless at the bottom to constitute an air-heating chamber between the parts 4 and 4^a and a long but narrow opening at the bottom for the escape of heated air into the furnace-chamber and over the burning fuel. The inner plate 4^a of the door is preferably provided with pins or lugs 4^b integral therewith, which are arranged in a staggered order and made to project internally to increase the air-heating capacity of the plate 4^a from the radiating heat of the fire.

In Fig. 5 the injector 10 is placed at a short distance below the opening and closing valve and leads the mixture of air and steam into the T-joint of the two branch pipes 8, which carry, as before described, the pendent flexible pipes 9, the lower ends of which can be connected directly by means of screw-nipples with the doors 4. The stem of the valve 7 is provided with side arms 7^a to operate it, and the latter have pendent chains 7^b, which can be extended within easy reach of the fireman to close the valve a few minutes after fresh coal put in the furnace is burning brightly or at least before he opens the furnace-door; but he should open the valve again immediately after closing the door.

Having now fully described my invention, I claim—

1. In combination with the front of a steam-boiler furnace, and the steam-drum of a boiler, the rearwardly-recessed fire-door 4, hinged to said front, and the inner plate 4^a, of said door having flanges on its top and sides, a steam-pipe to lead steam forward of said door, a valve thereon, a flexible pipe leading from the steam-pipe to the fire-door, and an injector intermediate of the boiler and the fire-door, substantially as described.

2. In combination with the front of a steam-boiler furnace, and the steam-drum of a boiler, the fire-door 4, hinged to said front, a steam-pipe to lead steam toward said front, a valve thereon, a flexible connection leading from the steam-pipe to the fire-door, and an injector intermediate of the valve and the fire-door 4, said door consisting of a plate flanged inwardly all around and the inner plate 4^a having flanges on the top and sides but a flangeless bottom, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM E. COLE.

Witnesses:

E. E. MASSON,

HARRY L. AMER.