

No. 623,426.

Patented Apr. 18, 1899.

W. REDPATH.
SMOKE CONSUMER.

(Application filed Nov. 19, 1898.)

(No Model.)

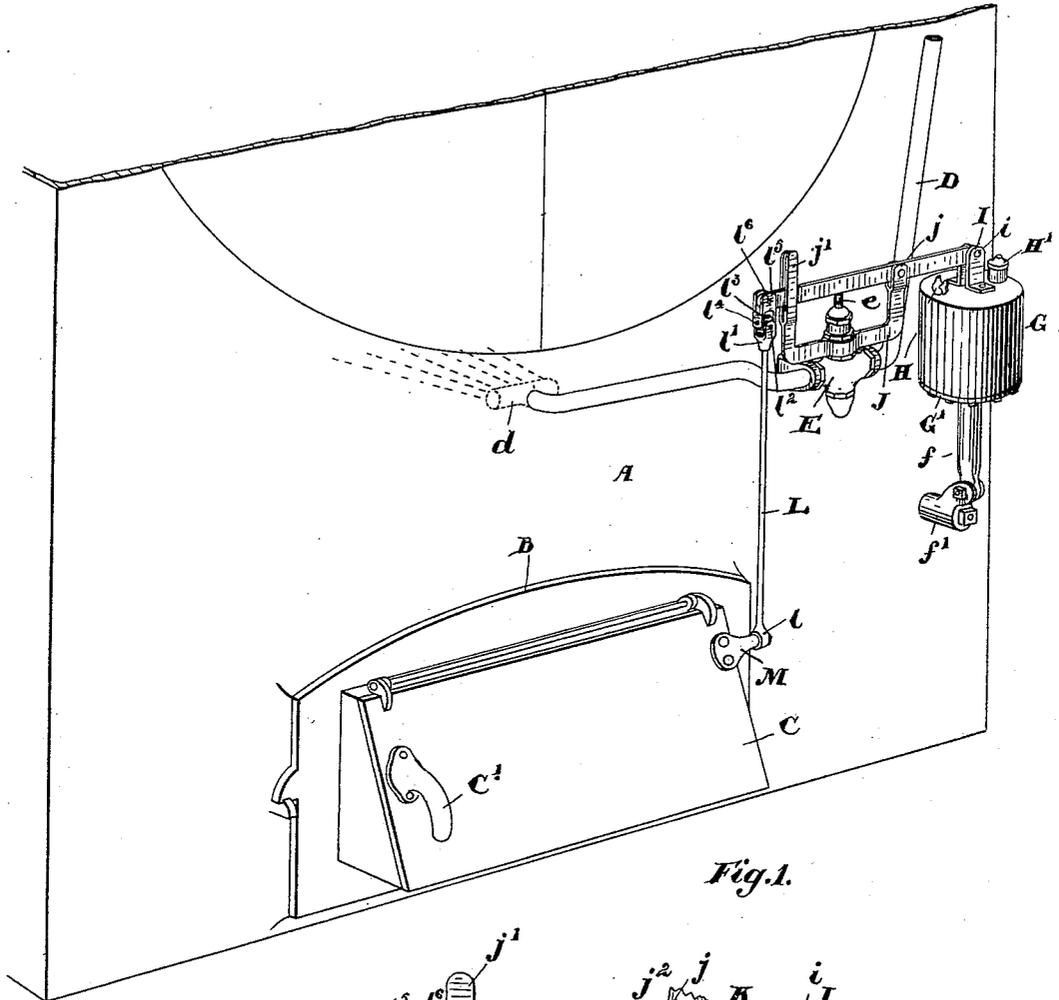


Fig. 1.

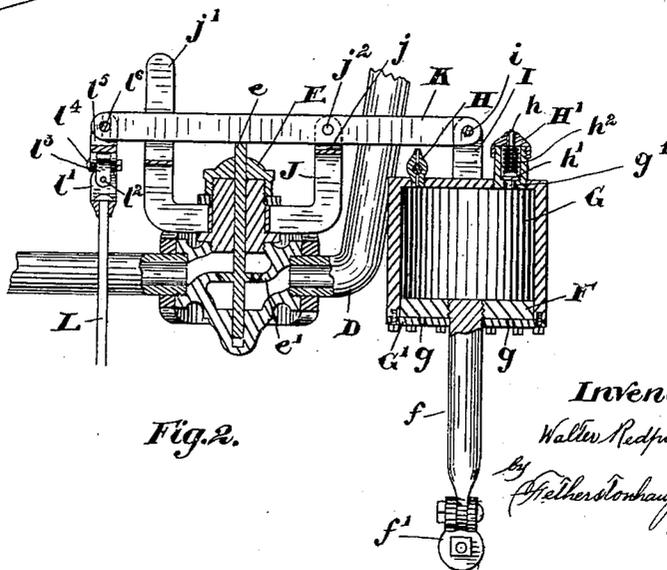


Fig. 2.

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UNITED STATES PATENT OFFICE.

WALTER REDPATH, OF TORONTO, CANADA, ASSIGNOR OF ONE-HALF TO
ANDREW HUGH REID, OF SAME PLACE.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 623,426, dated April 18, 1899.

Application filed November 19, 1898. Serial No. 696,921. (No model.)

To all whom it may concern:

Be it known that I, WALTER REDPATH, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Smoke-Consumers, of which the following is a specification.

My invention relates to improvements in smoke-consumers for furnaces; and the object of the invention is to design a simple device which will be always in position to be operated and will be operated automatically without any attention whatever on the part of the fireman or attendant of the furnace; and it consists, essentially, of providing on the steam-pipe leading into the furnace above the fire and on the outside of the furnace-chamber a check-valve provided with a central rod or spindle which is controlled through a vacuum-pot which is itself connected at one end to a lever pivoted on a suitable support extending over the rod of the check-valve and connected on the opposite end by a rod to a bracket connected to the damper of the furnace-door, the parts being constructed and arranged as hereinafter more particularly explained.

Figure 1 is a perspective view of a portion of the front of a furnace and boiler, showing my improvement. Fig. 2 is an enlarged section through the vacuum-pot and check-valve.

In the drawings like letters of reference indicate corresponding parts in both the figures.

A is the front of the furnace, B the door thereof, and C the damper in the door, which is provided with the usual handle C'.

D is a steam-pipe which extends down from the boiler and is provided at the inner end, inside the furnace-chamber, as shown in dotted lines, with a suitable spraying device *d*.

E is a check-valve, the central spindle *e* of which is provided with the usual valve, having its seat on the partition *e'*.

F is a piston provided with a rod *f*, which is pivotally held at the bottom in the bracket *f'*.

G is a vacuum-pot, which is preferably cylindrical in form and provided with a bottom G', having perforations *g* to admit the air.

H is a petcock, and H' is a valve provided with a central stem *h*, having the head *h'* and

the spring *h²* between the head of the valve-chamber. The head *h'* covers the orifice *g'*.

I I are a pair of brackets secured to the top of the vacuum-pot G.

J is a bracket supported upon the central portion of the check-valve and provided with forked upper ends *j* and *j'*.

K is a lever pivoted on a pin *j²* in the forked end *j* and pivotally connected by a pin *i* to the brackets I at the top of the vacuum-pot G.

L is a rod having a lower eye *l*, which is pivotally connected to the trunnion-shaped end of the bracket M, secured to the damper C. The upper end is provided with a jaw *l'*, which is connected by the pin *l²* to a jaw *l³*, pivotally connected by the bolt *l⁴* to the jaw formed at the bottom of the double jaw *l⁵*, which is pivotally connected by the pin *l⁶* to the end of the long end of the lever K. It is hardly necessary to describe the exact construction immediately set forth above, as such construction is a common universal joint, but I have done so for the sake of clearness.

The operation of my invention is as follows: As the handle C' is the handle to open the door, immediately such handle is pulled upon the door B is opened, and the damper also is opened at the same time, thereby pushing upon the rod L and raising the lever K, so that the spindle *e* of the check-valve is permitted of an upward movement, thereby opening the valve and allowing the steam to pass over the fire. As the lever K is tilted on its pivot and forces the vacuum-pot G down upon the piston F the air forces its way through the valve H' until the top of the vacuum-pot reaches the top of the piston. When the coal has been thrown in upon the fire and the door again closed, the petcock H being open allows the air to gradually enter above the piston F and relieve the vacuum, thereby causing the vacuum-pot to rise and tilt the lever on its pivot and gradually lower the spindle *e* of the check-valve, and thereby gradually cutting off the supply of steam. The damper C also gradually closes.

It will thus be seen that the operation of my device will be perfectly automatic upon each opening of the door of the furnace to throw in coal, and as all the parts are permanently

connected together there is no danger of my device getting out of order and becoming inoperative.

It will of course be understood in the operation of my device that the weight of the damper overbalances the weight of the vacuum-pot and the resistance created by the vacuum therein when the vacuum-pot is lowered upon the piston. The piston, therefore, only allows of the weight of the damper gradually overcoming the weight and resistance in the vacuum-pot.

What I claim as my invention is—

1. The combination with the steam-pipe for conveying steam into the interior of the furnace and the door of such furnace, of a check-valve situated intermediate of the length of the steam-pipe and provided with an upwardly-extending spindle, a lever suitably pivoted and extending over the spindle, a vacuum-pot connected at one end of the lever and provided with an air-valve and petcock at the upper end thereof and a suitably-perforated bottom, a piston located in the pot and a rod therefor suitably connected at the bottom to a support and a rod connected to the furnace-door at one end and having a universal-joint connection at the opposite end to the long end of the lever as shown and for the purpose specified.

2. The combination with the steam-pipe for conveying steam into the interior of the furnace, and the door of such furnace, of a check-valve situated intermediate of the length of the steam-pipe and provided with an upwardly-extending spindle, a lever, a bracket held on the top of the check-valve and having

a pivotal support at one end thereof for the lever and a guiding-jaw at the opposite end, a vacuum-pot connected at one end of the lever and provided with an air-valve and petcock at the upper end thereof and a suitably-perforated bottom, a piston located in the pot and a rod therefor suitably connected at the bottom to a support and a rod connected to the furnace-door at one end and having a universal-joint connection at the opposite end to the long end of the lever as and for the purpose specified.

3. The combination with the steam-pipe for conveying steam into the interior of the furnace and the door of such furnace, of a check-valve situated intermediate of the length of the steam-pipe and provided with an upwardly-extending spindle, the lever suitably pivoted and extending over the spindle, a vacuum-pot connected at one end of the lever and provided with an air-valve and petcock at the upper end thereof and a suitably-perforated bottom, a piston located in the pot and a rod therefor suitably connected at the bottom to a support, a damper for the furnace-door hinged at the top and provided with a suitable handle, a bracket extending laterally therefrom and forming a trunnion, a rod having an eye at the bottom end journaled on the trunnion and a universal-joint connection at the top of the rod—as shown and for the purpose specified.

WALTER REDPATH.

Witnesses:

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