

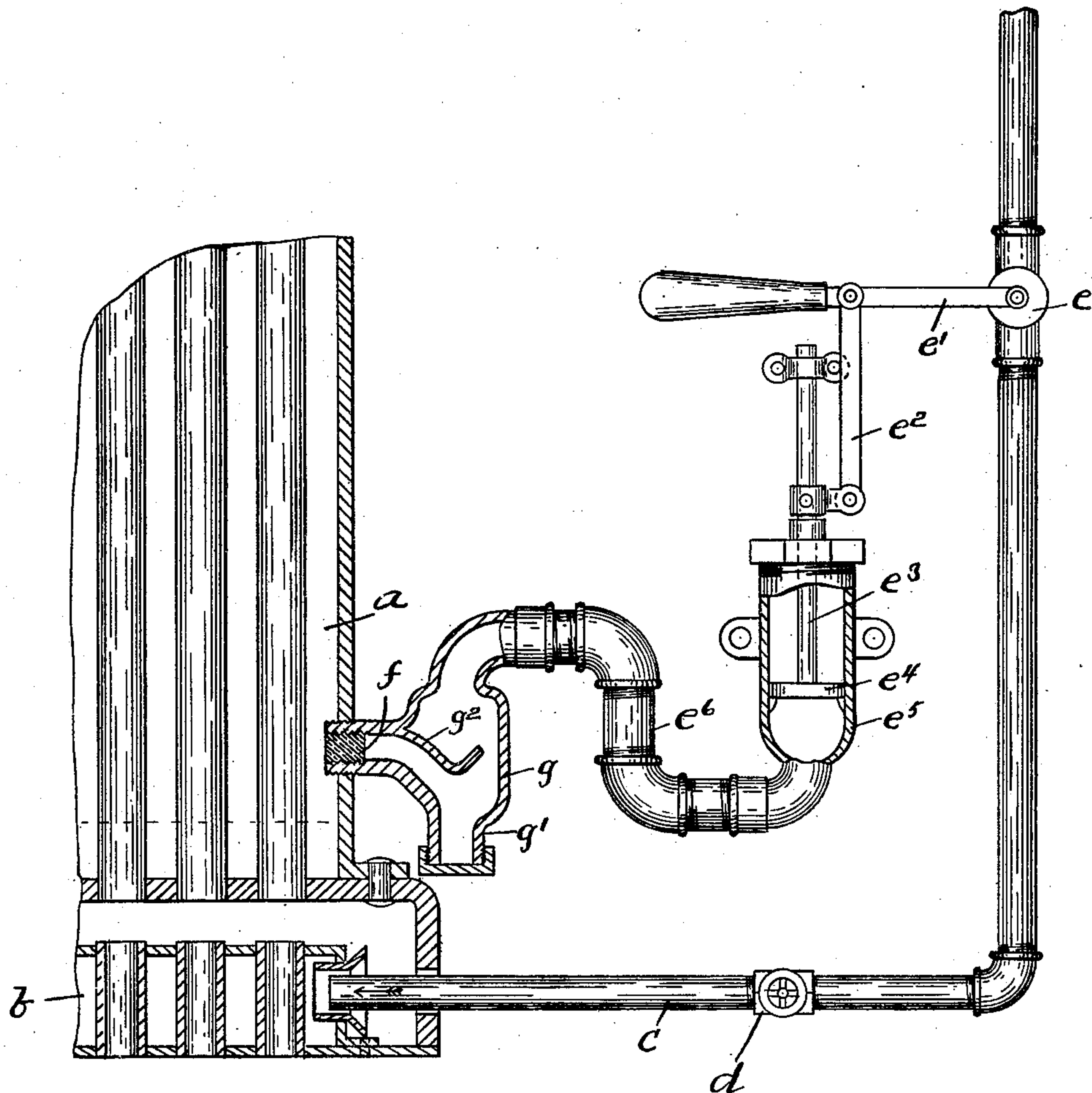
No. 685,244.

Patented Oct. 29, 1901.

J. H. BICKFORD.
SAFETY APPLIANCE FOR STEAM BOILERS.

(Application filed Jan. 31, 1900.)

(No Model.)



Witnesses:

H. B. Davis.
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UNITED STATES PATENT OFFICE.

JOHN H. BICKFORD, OF SALEM, MASSACHUSETTS.

SAFETY APPLIANCE FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 685,244, dated October 29, 1901.

Application filed January 31, 1900. Serial No. 3,468. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. BICKFORD, of Salem, county of Essex, and State of Massachusetts, have invented an Improvement in Safety Appliances for Steam-Boilers, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention relates to safety appliances especially adapted for use in connection with boilers having a burner connected with a supply of hydrocarbon; and the invention has for its object to provide such type of boiler with a safety appliance whereby the supply of hydrocarbon will be automatically shut off in case the water in the boiler is reduced to the point of danger.

The invention consists in providing the supply-pipe by which hydrocarbon is conducted to the burner with a valve which is adapted to be operated by means controlled by the temperature of the boiler, such means consisting of a fusible plug fitted into a pipe which leads from the boiler at a point just above low-water line and a cylinder connected with said pipe containing a piston which is connected with the valve, and whenever the water falls to the low-water line and the temperature of the boiler rises abnormally said plug will fuse and cause the piston to move and operate the valve and shut off the supply of hydrocarbon.

The drawing shows in side elevation and partial section a safety appliance for steam-boilers embodying this invention.

a represents a boiler, which may be of any usual or suitable construction, and *b* a burner, which may also be of any usual or suitable construction so far as this invention is concerned.

c is a supply-pipe by which hydrocarbon is conducted to the burner *b*. The passage through the supply-pipe is controlled by a valve *d*, adapted to be operated in any suitable manner, and said pipe is also controlled by a valve *e*, adapted to be operated automatically, as will be described. The stem of the valve *e* has attached to it a handle, or it may be an arm *e'*, which is connected by a link *e²* with a piston-rod *e³*, bearing a piston *e⁴*, working in a cylinder *e⁵*, to which the pipe *e⁶* is connected. The piston and cylinder serve as and constitute a motor for operating the valve *e*. The pipe *e⁶* leads to the boiler and

is connected to the wall thereof at a point near the bottom of the boiler just above low-water line. The pipe *e⁶* is normally closed by a fusible plug *f*, which may be disposed at any point along the pipe, although preferably at the end where said pipe enters the wall of the boiler. The pipe *e⁶* has formed as a part of it a chamber *g*, which is provided with a pocket *g'* and also with a deflecting-wall *g²*, and said chamber is located between the fusible plug and the motor and is employed for the purpose of deflecting the fused metal of the plug and directing it into the pocket *g'* in case said plug fuses, and in such event the steam from the boiler passes through or along the pipe *e⁶* to the cylinder *e⁵* and by acting upon the piston operates the valve *e* to automatically close the supply-pipe to the burner.

I do not desire to limit my invention to the employment of a piston and cylinder as a motor for operating the valve *e*, as I desire to broadly include within the spirit and scope of this invention any form or construction of motor adapted to be set in operation by the fusing of the fusible plug to in turn automatically operate the valve *e* and close the supply-pipe to the burner.

I claim—

1. The combination of a boiler, a burner therefor, a supply-pipe for said burner, a valve controlling the passage through said pipe, a pipe leading from the boiler near the bottom having a chamber as *g* provided with a pocket *g'*, a fusible plug normally closing said pipe, and a motor connected with said pipe which is in turn connected with and adapted to operate the aforesaid controlling-valve, substantially as described.

2. The combination of a boiler, a burner therefor, a supply-pipe for said burner, a valve for controlling the passage through said pipe, a pipe leading from the boiler near the bottom having a chamber as *g* provided with a deflecting-wall *g²*, a fusible plug normally closing said pipe, and a motor connected with said pipe which is in turn connected with and adapted to operate the aforesaid controlling-valve, substantially as described.

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

JOHN H. BICKFORD.

Witnesses:

FORREST L. EVANS,
ARTHUR A. AVERILLE.