H. V. COLEMAN.

CIRCULATING WATER HEATER FOR STEAM FIRE ENGINES.

No. 106,782. Patented Aug. 30, 1870.

Fig 1

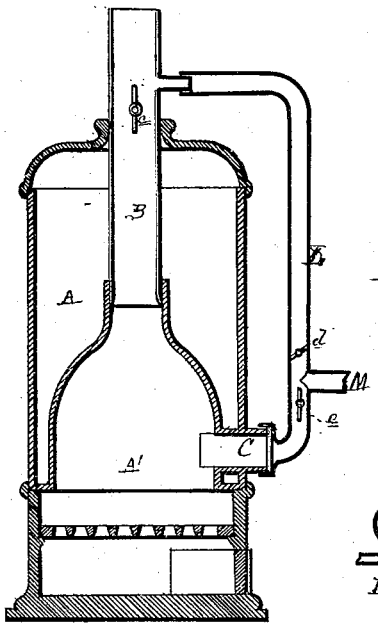


Fig 2

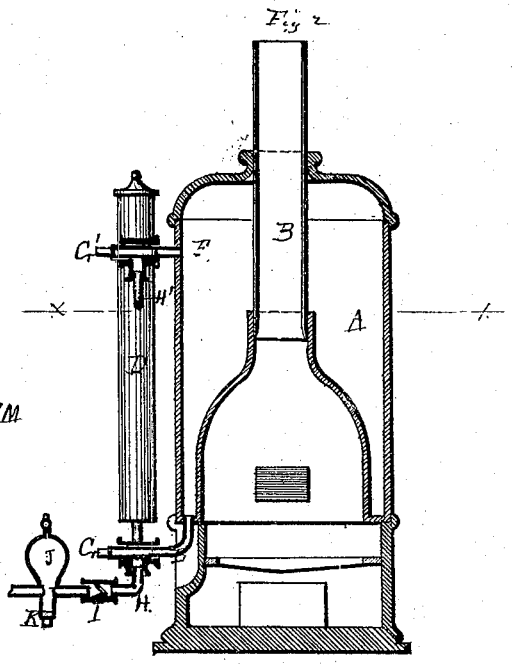


Fig 3.

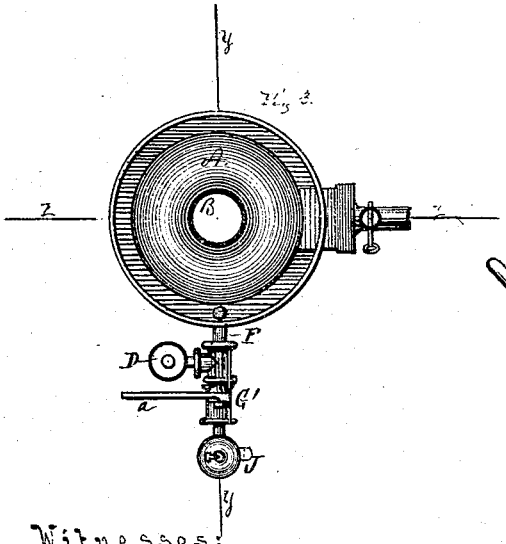


Fig 4.

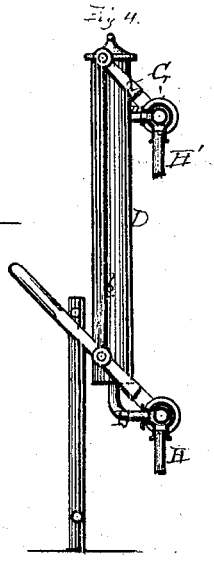
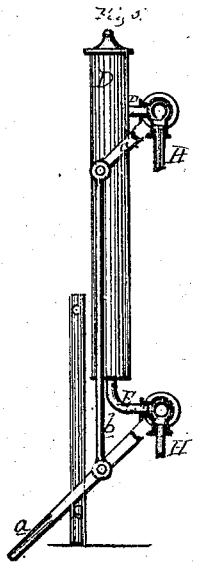


Fig 5.



Witnesses:

Sam J. Sprague

Frank Dunlap

Inventor:

H. V. Coleman

per Thos. S. Sprague

United States Patent Office.

HENRY V. COLEMAN, OF CHICAGO, ILLINOIS.

Letters Patent No. 106,782, *dated August* 30, 1870

IMPROVEMENT IN CIRCULATING WATER-HEATERS FOR STEAM FIRE-ENGINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HENRY V. COLEMAN, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Circulating Water-Heaters; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon, and being a part of this specification, in which—

Figure 1 is a vertical section on the line *y y* in fig. 3.

Figure 2 is a vertical section on the line *z z* in fig. 3.

Figure 3 is a cross-section on the line *x x* in fig. 2.

Figure 4 is a front elevation of the circulating-pipes, and their connections, with the three-way cocks open, for circulating heated water through another boiler.

Figure 5 is the same, showing communication shut off from the boiler, and the circulation carried on through the stand-pipe of the heater.

Like letters refer to like parts in each figure.

The nature of this invention relates to an improvement in the construction and method of operating circulating water-heaters.

It consists—

First, in the peculiar construction of the water-heater and circulating-pipes, and

Second, in providing the same with detachable flues, by means of which the heat and gases of combustion from the stove, used in warming the apartment or building, may be conducted through the same, and thus utilized for the purpose named during several months of the year, and saving the expense of a special fire in the heater during the season in which a heating-stove is required.

The improvement in question is more particularly designed to be used in the houses of steam fire-engines, for the purpose of keeping the water in the boilers of said engines at or near the boiling-point, in order that steam may be quickly generated when the engine is called into service.

In the drawing—

A represents a small upright boiler, from whose furnace A′ the flue B passes up out of the boiler, as shown.

C is the opening in the side of the boiler, through which fuel is introduced to the furnace, when the heater is independently operated.

D is a stand-pipe at one side of the heater, communicating with the lower part thereof by the pipe E, and near the top with another pipe, F.

In these pipes are respectively placed the three-way cocks G G′, each provided with a discharge-nozzle, to which flexible or other pipes, H H′, are connected, and leading to the boiler of the engine.

Between the lower three-way cocks and the boiler is a check-valve, I, opening toward the heater, and between this check-valve and the boiler is an air-chamber, J, and below, a sediment-receiver, K.

The levers *a*, which operate the plugs of the cocks, are connected by a rod, *b*, by means of which they are moved in unison.

When applied to the boiler of a steam fire-engine, the three-way cocks are connected therewith by the pipes H H′, as described, the boiler of the heater being nearly or quite full of water, and standing so that its upper part is on a plane with the ordinary water-line of the engine-boiler

The levers of the cocks are raised in the position shown in fig. 4, when communication is opened between both boilers.

Now, if heat be applied to the water in the heater, it will be expanded and forced through the upper cock and pipe, into the upper part of the engine-boiler, and cold water from the lower part thereof will replace it, returning through the lower pipe and cock.

Should there be any sediment held in solution, it would naturally be deposited in the receiver K, whence it may readily be blown out through a cock in its bottom.

By throwing down the levers, as shown in fig. 5, communication between the heater and engine-boiler is shut off, and opened between the heater and stand-pipe, when the circulation proceeds in them in the manner described.

When the communication is thus closed between the heater and engine, the latter may be removed without danger of the boiler being burned.

L is a bifurcated flue, leading from the smoke-pipe M of the heating-stove, which should be placed in close proximity thereto.

The lower end of the flue L is fitted over the mouth of the opening C in the furnace, the fire-door being removed for that purpose.

The upper end of the flue communicates with the external part of the flue B, which has a damper, *c*, fitted therein below the junction.

The vertical part of the flue L has a damper, *d*, pivoted therein above the entrance of the flue M, and another one, *e*, below, the object of the employment of the flue L being to utilize the waste heat of the heating-stove in the following manner:

The dampers *c e* are opened, as shown in fig. 1, and the damper *d* closed, when the heated products of combustion from the stove will be compelled to pass

through the heater, and thus save the expense of a separate fire for the purpose of heating the water of the engine-boiler.

When a direct draught is desired, the position of the dampers is reversed.

I do not intend to confine myself merely to the employment of heating water for the boilers of steam fire-engines, as it is equally adapted to other like purposes.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In circulating water-heaters, the construction and arrangement of the three-way cocks G G', pipes H H', chuck-valve I, pipes E F, and stand-pipe D, with a heating-boiler, A, substantially as and for the purpose set forth.

2. In combination with a boiler, A, constructed substantially as described, the bifurcated flue L, as and for the purpose set forth.

HENRY V. COLEMAN.

Witnesses:

HARRY S. SPRAGUE,

SAMUEL E. JONES.