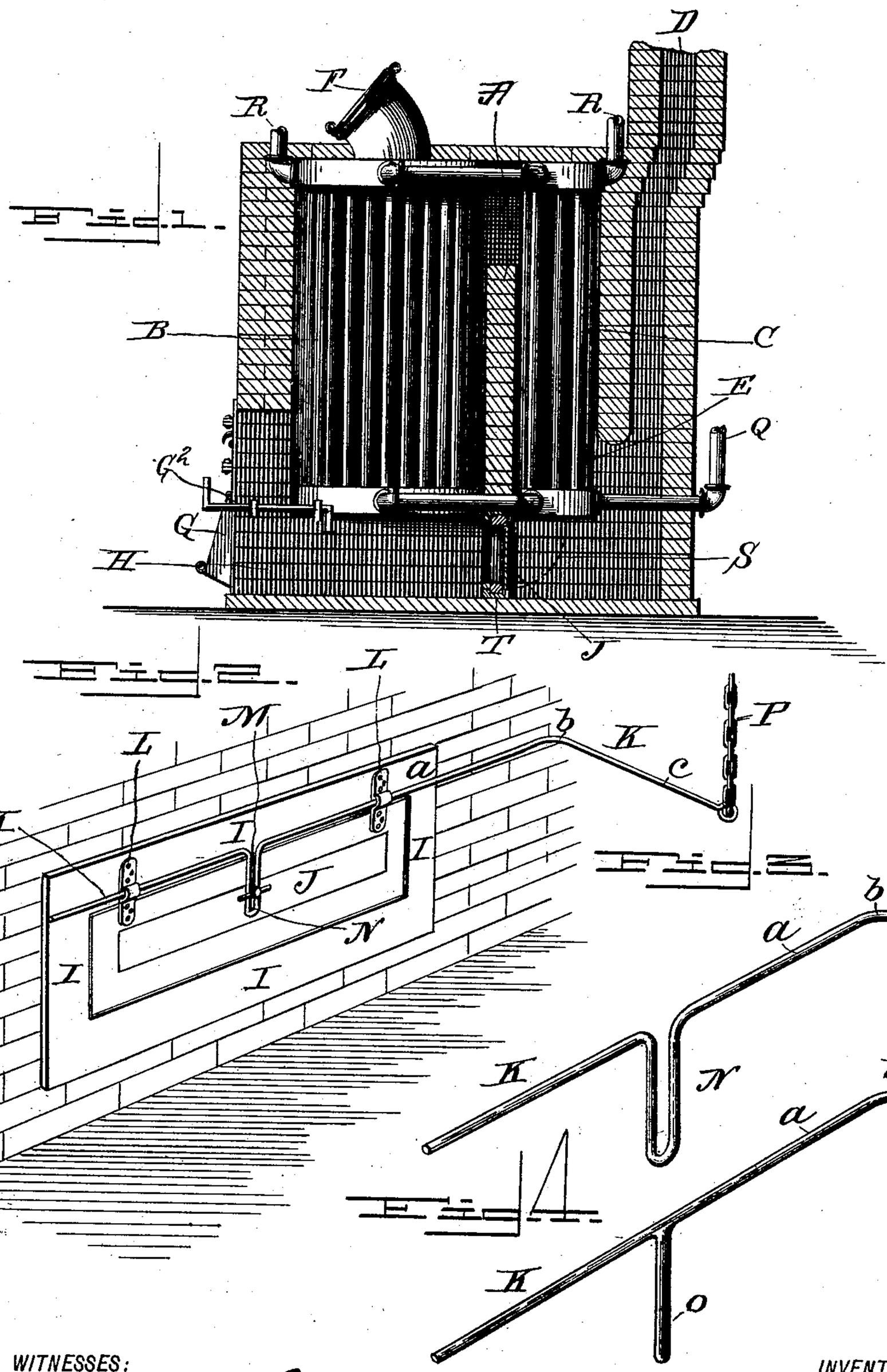
(No Model.)

C. PHELPS.

STEAM OR HOT WATER HEATER.

No. 506,859. Patented Oct. 17, 1893.



WITNESSES:

W. H. Pumphrey.

W. H. Edwards.

INVENTOR

Charles Phelps

BY

Thos. D. Hitchcock,

ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES PHELPS, OF OSKALOOSA, IOWA.

STEAM OR HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 506,859, dated October 17, 1893.

Application filed January 21, 1893. Serial No. 459,142. (No model.)

To all whom it may concern:

Be it known that I, CHARLES PHELPS, a citizen of the United States, residing at Oskaloosa, in the county of Mahaska and State of Iowa, have invented a certain new and useful Improvement in Steam or Hot-Water Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in steam or hot-water heaters and consists in providing a check-damper by which the combustion of fuel may be effectively and rapidly regulated and by which the cheapest grades of soft or bituminous coals may be efficiently used, if desired, as fuel; and by which, incidentally, the soot, smoke, and other imperfectly consumed products of combustion are completely destroyed, preventing the deposit of said products in the chimney and the choking of the same in consequence.

My invention is illustrated in the accompanying drawings forming a part hereof, wherein—

Figure 1 is a vertical section of a conventional form of heater with my invention applied thereto. Fig. 2 is a detail view showing all the parts of my invention. Figs. 3 and 4 are details of the form of lever forming a part of my invention.

Similar letters refer to similar parts throughout the several views.

In the conventional form of heater shown in Fig. 1, A, is a bridge-wall extending from the foundation of the heater to about three-fourths the height of the vertical tubular sections of the heater and separating the fire-chamber, B, from, and partly forming, the auxiliary heating chamber, C, which connects with the chimney, D, at E. There is the usual fuel-supply door at F and the door G feeds air to the fire-chamber and, also, serves as an exit for the ashes in the ash-pit, H. There is the usual grate forming the floor of the fire-chamber, B. The usual flue-dampers may be employed but I have not deemed it necessary to show them in my drawings as they may be of the ordinary construction. Water is supplied at Q, passes through the annular headings and vertical pipes of the chambers B and C, and out for distribution at R, R.

It will be readily seen that, through the operation of the natural draft, consumption of fuel supplied in any desired quantity, and in immediate contact with the lower annular heading and the lower portion of the vertical water pipes surrounding the fire-chamber B, in conjunction with the intensely heated products of combustion deflected to the top of the heater by the bridge-wall A, and carried across to and down from the top to the bottom of the auxiliary heating chamber C, passing into the chimney at E, is the source of heat to the water circulating in the before-described manner through the heater. By the old and usual devices, the degree of combustion is regulated by the operation of the grate-damper at G in conjunction with such flue check-dampers as may be provided. By the operation of such devices, it will be readily understood that the natural draft still exists though checked in force; that the highly heated products of combustion, following the natural draft, still circulate about and in contact with the water pipes causing the contents of said pipes to lose their heat inappreciably till the combustion of fuel has become very slow; and, that, if bituminous coals, especially the cheaper grades, are used as fuel, the old and usual devices operate very inefficiently, if not wholly so, to regulate the combustion.

To effectively control the combustion, even when the cheapest grades of bituminous coal are used for fuel, and to give greater and more immediate regulation to the heat supplied by steam or hot-water heaters and, incidentally, to destroy the soot, smoke, and other products of combustion not wholly consumed, I provide in the arrangement shown in the lower portion of the bridge-wall, T, Fig. 1, just below the grate, and opening on the side of the bridge-wall contiguous to the chimney-flue, a check-damper consisting of a rectangular plate, preferably of iron, I, of any desired size, having an aperture of similar form opened and closed at will with a hinged lid, J, by means of the elbow rod or lever, K, turning in the bearings, L, L, and bolted to the lid J at M by a loop-elbow N Figs. 2 and 3, or

a tongue, O, Fig. 4, whereby the hinges are relieved from strain. The arm *a* of the elbow rod or lever projects through the casing of the heater through a suitable orifice so that the elbow *b* with the arm *c* is outside the casing. Attached to the extremity of the arm *c* is a cord or chain, P, conducted to any convenient point by which the check-damper is operated and the fire regulated without going into the basement or cellar. It will be readily seen that by opening the said check-damper in the direction indicated at S, the natural draft instead of operating to draw the air up through the fuel and circulate the heated products of combustion through the heating chambers of the heater, operates directly upon the bottom of the fire causing a primary draft to be established down through the fuel and away from the heating surfaces of the heating chambers directly into the chimney-flue by way of the ash-pit thus checking combustion by drawing the air away from the least burned portions of the fuel and regulating the heat of the water pipes not only by checking combustion but also by drawing the heated products of combustion away from contact with the surfaces of the water pipes and passing them under the heater, instead of through it, into the chimney. In this process the soot, smoke, and other partially consumed products of combustion in being drawn through the fire are consumed and the chimney draft is kept efficient and constant by thus preventing the deposit of soot and other partially burned substances.

I have shown my invention as applied to a conventional form of heater but it will be readily understood by any one skilled in the art that it is adapted to any form of heater where its services are desired; and, therefore, I do not desire to limit myself to the exact form of heater shown and described: but

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

In a steam and hot water heater, the combination with a main heating chamber, and an auxiliary heating chamber communicating therewith, a bridge-wall separating the chambers, and provided with a passage adjacent the base thereof, a second bridge-wall similarly provided with a base opening and located in the rear of said first mentioned wall and separating said auxiliary chamber from the chimney flue, and a check damper closing the passage in the forward or first mentioned wall, said damper consisting of a rectangular plate having an opening therein a lid hinged to the plate and covering the opening a rod or lever bent at right angles to its length and detachably connected with the lid and means for rocking the rod whereby the passage in the wall may be opened or closed, as specified.

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

CHARLES PHELPS.

Witnesses:
H. STRASBURGER,
ANNA PHELPS.