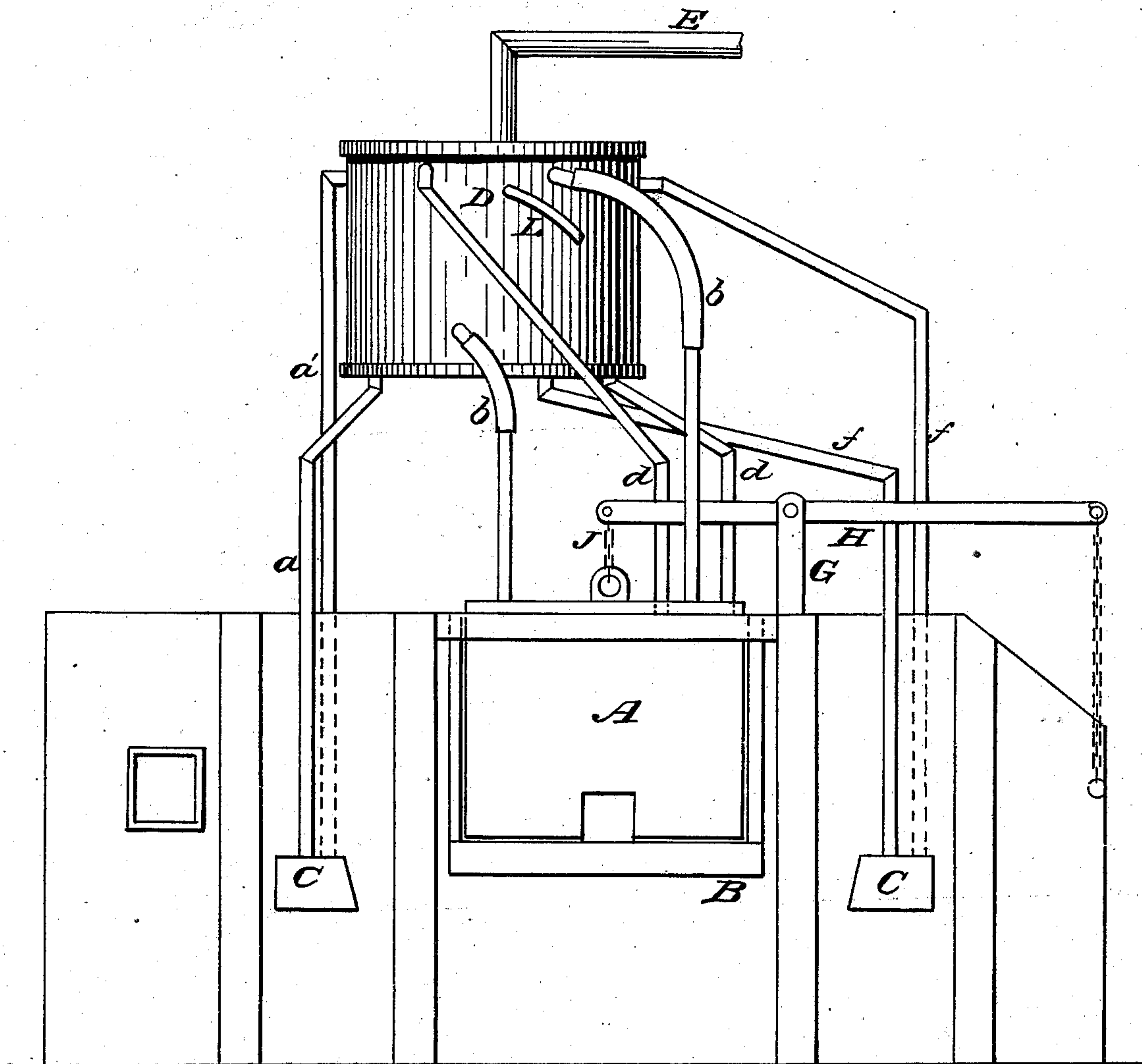


E. G. SCOVIL.
Protecting Furnaces.

No. 70,031.

Patented Oct. 22, 1867.



Witnesses:
Thos Turch
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EDWARD GEORGE SCOVIL, OF ST. JOHN, NEW BRUNSWICK.

Letters Patent No. 70,031, dated October 22, 1867.

IMPROVED METHOD OF PROTECTING THE HEATED PARTS OF FURNACES.

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, EDWARD GEORGE SCOVIL, of St. John, New Brunswick, have invented a new and improved Method of Protecting Heated Surfaces; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification.

My improvement relates to that class of inventions which applies to furnaces for the manufacture of iron, and for other purposes where intense heat is necessary, my object being to protect and secure those parts of the furnace which are most exposed to the heat from destruction or damage. The drawing represents a side elevation of a puddling-furnace, showing the water-reservoir and pipes which I use in carrying out my invention.

A is the furnace-door, B is the door-frame, C C are the boshes, and D is the water-reservoir.

It is well known that there are portions of puddling and other furnaces which are very much exposed to heat, and in consequence of which they are frequently destroyed, or, if not destroyed, damaged so as to seriously interfere with the working of the furnace, and various devices have been resorted to by those engaged in the manufacture of iron for the protection of those exposed parts. It is not uncommon for currents of air to be forced through the boshes and in contact with the heated plates, for the purpose of cooling the heated surfaces, while the air thus heated has been used for the blast. Again the boshes and other exposed parts have been cast hollow, and water has been either forced or suffered to run through the cavities thus formed for the purpose of cooling the heated surfaces and carrying off a portion of the heat. Air has been found insufficient for the purpose, in consequence of the intensity of the heat, while the supply of water by the old method was liable to be interrupted from various causes, and generally at a time when an intermission of even one minute would cause very serious damage. After a good deal of experience in iron manufacture, and after many experiments, with the design of overcoming the difficulty, I have at length discovered a method which has proved to be an efficient protection, and the thing so much needed.

In constructing my furnace the exposed portions are made hollow and water-tight, similar to those heretofore used for water. The door, the door-frame, the exposed castings, and the boshes are thus formed. Above the furnace, sufficiently high to insure a head of water, I place a reservoir, D, and connect it by water pipes to the exposed portions of the furnace in such a manner that while there is water in the reservoir there is a constant circulation of water through the hollow exposed portions of the furnace. E is the supply pipe, which keeps the reservoir constantly supplied with water. The pipes *a* and *a'* connect the reservoir with one of the boshes C, one pipe at each end of the bosh. The pipe *a* connects with the bottom of the reservoir, while the pipe *a'* connects with the top or near the top. The effect of this arrangement is that the water will run down the pipe *a*, from the bottom of the reservoir, where the water is comparatively cold, into and through the bosh, becoming thereby greatly heated. Being thus charged with heat, and expanded, it rises through the pipe *a'* and is discharged back into the reservoir, and in this way a constant current is maintained through the bosh, carrying off a portion of the heat, and preventing the bosh from being damaged. This system depends upon the heating and expansion of the water, by which a constant circulation is kept up through the pipes. The door and door-frame and other exposed plates and castings are connected with the reservoir in the same way, and the same circulation of water is constantly going on through them. The pipes *b b* which connect the door A with the reservoir, are partly formed of elastic hose pipe to allow the door to be raised and lowered. *d d* are pipes which connect the furnace-door frame and castings with the reservoir, and *f f* connect the other bosh C in the same way. L is a waste or overflow pipe, which conveys the overflowing water to a tank where it is used for cooling the tools. By this arrangement no damage would be caused by the stoppage of water through the supply pipe E for a considerable length of time, as there would be no overflow, and the water in the reservoir would be retained, and the circulation would be maintained. G is a standard, which supports the fulcrum of the lever H by which the furnace-door is raised. J is a chain, connecting the end of the lever with the door. K is a chain to operate the lever.

I do not confine myself to the use of my arrangement for puddling-furnaces only, nor to furnaces of any or all kinds. It may be applied to furnace-doors or door-frames of any kind, to tuyere irons, "water-backs," or exposed metallic plates or surfaces of any kind, to protect them from too intense heat.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

Protecting metallic and other surfaces from the effects of heat by the circulation of water, when the circulation is caused by the heat, and in the manner as substantially herein shown and described.

EDWD. GEO. SCOVIL.

Witnesses:

JAMES DOURVILLE,
JAMES SCOVIL.