2 Sheets—Sheet 1.

B. HERSHEY.

FIRE-BOXES FOR STEAM BOILERS.

No. 189,219. Patented April 3, 1877.

Fig. 1.

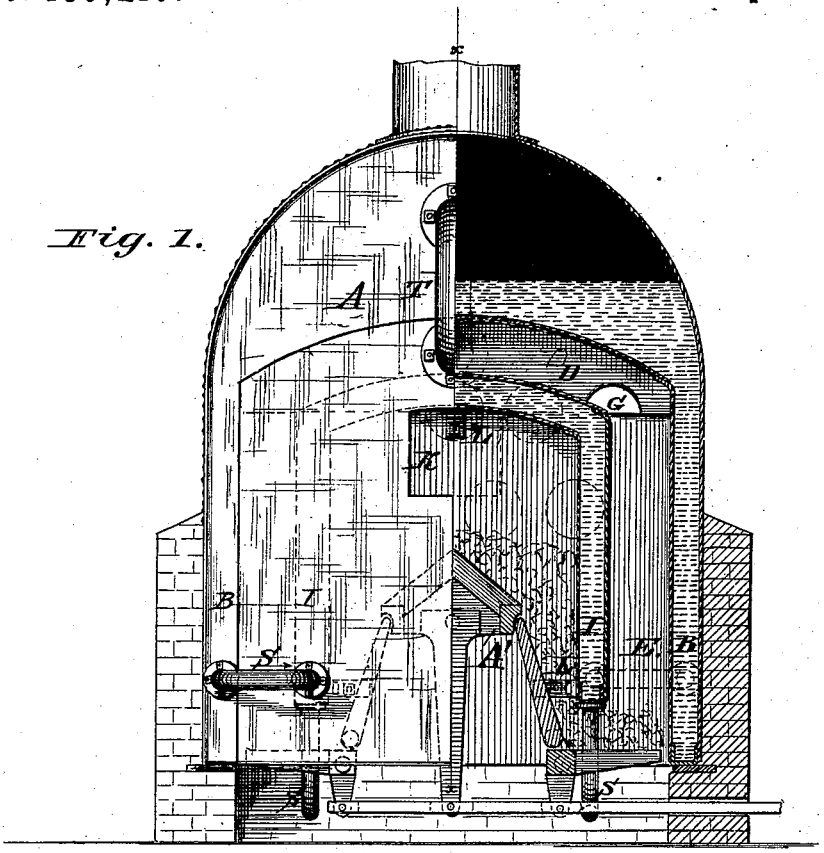
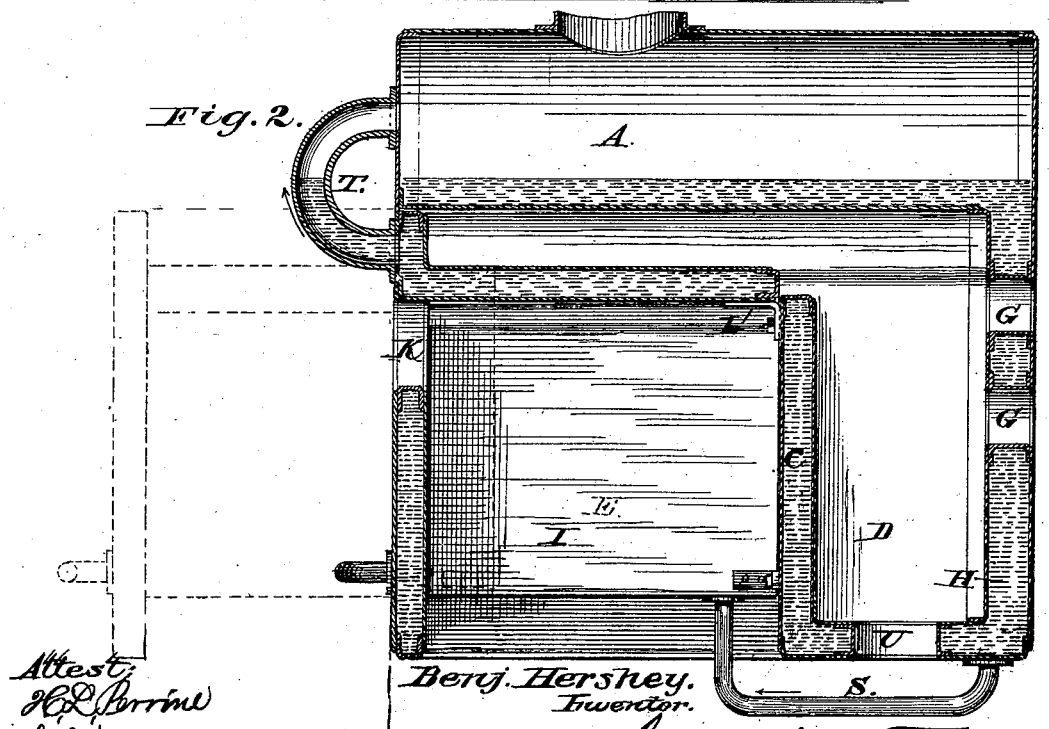


Fig. 2.



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By. James L. Norris
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2 Sheets—Sheet 2.

B. HERSHEY.

FIRE-BOXES FOR STEAM BOILERS.

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Fig. 3.

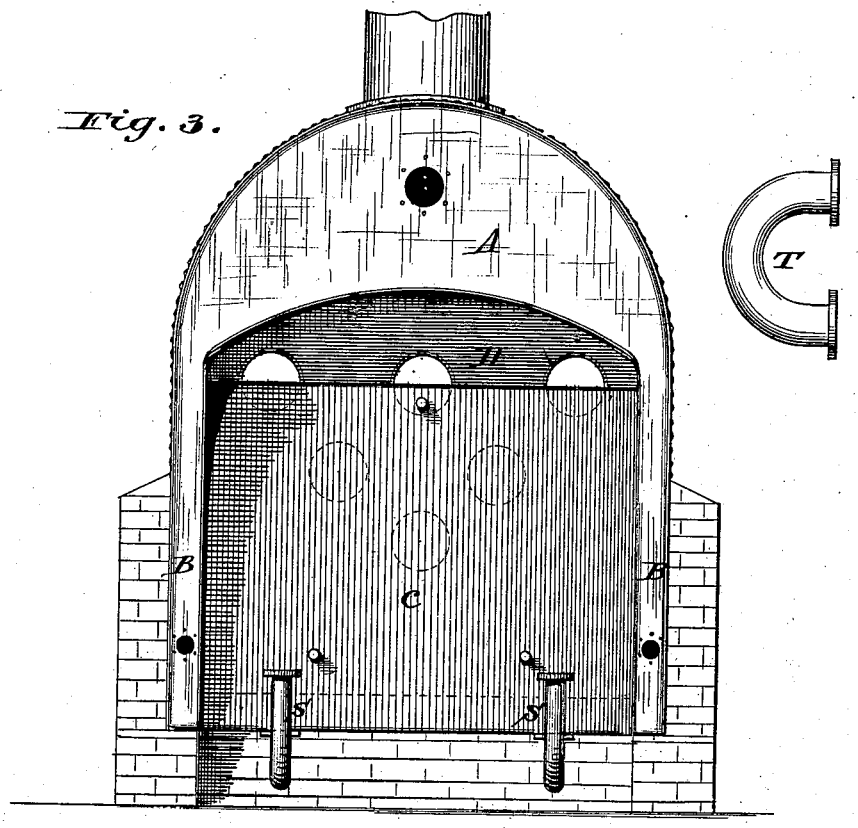
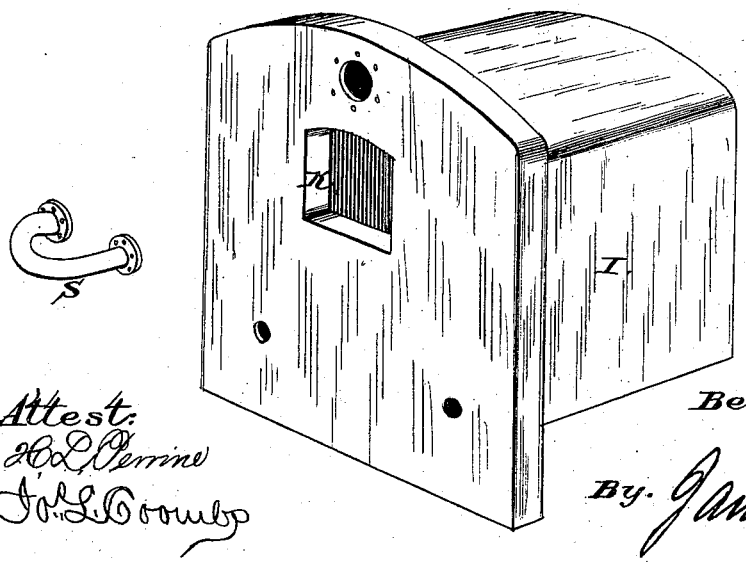


Fig. 4.



Attest:
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UNITED STATES PATENT OFFICE.

BENJAMIN HERSHEY, OF ERIE, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN E. SHAW, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN FIRE-BOXES FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **189,219**, dated April 3, 1877; application filed February 20, 1877.

To all whom it may concern:

Be it known that I, BENJAMIN HERSHEY, of Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification:

This invention relates to certain improvements in the construction of that class of steam-boilers which are provided with inner and outer water-legs, the inner water-legs forming a fuel-chamber proper, from which the coal or fuel is distributed to the fire chamber or chambers.

My invention consists in a steam-boiler furnace, in which are combined an inner water-leg section, outer water-legs, and an independent transverse fire-back, forming the rear of the fuel-chamber, which latter is composed of the inner water-leg section, all of which will be more fully hereinafter set forth in detail.

In the drawings, Figure 1 represents a view in partial front elevation and partial transverse vertical section of my improved boiler-furnace. Fig. 2 represents a longitudinal vertical section of the same. Fig. 3 represents a front view of the furnace with the detachable inner water-leg removed, and Fig. 4 a detached perspective view of said inner water-leg section.

The letter A represents the boiler proper, having descending water-legs B at each side, which form the combustion-chamber proper of the furnace. Near the rear of said chamber is located a transverse "fire-back," C, which is preferably constructed of fire-brick, or other refractory material, but may be constructed of iron in the form of a "water-back," and connected with the water-legs on each side. Said fire-back forms a flue or chamber, D, at the rear of the combustion-chamber, and terminates at a suitable distance below the curved bottom of the boiler proper, leaving an opening by which communication is established between the said flues E formed by the inner and outer water-legs. The said rear flue D communicates with the exit-flue or smoke-stack, by means of the flues G, through the rear water-leg H of the boiler. The letter I represents the inner water-legs of the furnace, which are constructed of an independent single section of wrought-iron, the front part of said section forming, when in place, the front of the furnace, being provided with an opening or door, K, for charging in the fuel. Said inner water-leg section is so constructed and arranged that it may be secured, by means of stays L, within the combustion-chamber proper, resting upon the brick work or walls which support the furnace at each end when in place, leaving a flue or flues, E, all around its outer walls and the inner walls of the outer water-legs and boiler proper. The letters S S represent detachable pipes, by means of which the inner and outer water-legs are put in communication with each other, and T a pipe by which communication is made with the boiler proper. The letter U represents one or more apertures at the bottom of the rear flue, for the removal of deposited ashes or soot from said rear flue, the said apertures being provided with suitable slides or doors for closing when not in use. The letter A′ represents the grate of the furnace, the central portion of which extends upwardly into the center of the combustion-chamber formed by the inner water-legs, said central portion of the grate being provided with inclined sides which adjoin at the bottom horizontal grate-sections, which extend to the outer water-legs of the furnace. The grate, as thus constructed, serves to distribute the fuel in a peculiar manner from the fuel-chamber to the combustion-chamber of the furnace; but as it forms the subject-matter of another application for a patent, it is not deemed necessary to enter into a further description of its construction at present.

The advantage obtained by thus constructing the inner water-legs in one independent section, which can be removed and replaced at pleasure, will be apparent. No riveting or calking will be necessary to properly connect it with the outer water-legs or boiler, as in the boilers heretofore constructed, thus cheapening the original cost of manufacture, and enabling repairs to be made with the utmost facility. As the transverse fire-back is not permanently attached to said water-legs, it will be evident that the same may be constructed

of fire-brick, when found desirable, instead of being constructed as a water-back in the ordinary manner, which further lessens the cost of construction and repairs, and as the inner water-legs are subjected to the most intense action of the heat, and are sooner burned out and rendered useless than the other portions of the furnace, the advantage of having the inner water-leg detachable will be evident, as it may be detached and replaced with a new one at comparatively little expense.

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

In combination with the inner water-leg section and the outer water-legs and boiler of a boiler-furnace, the independent transverse fire-back forming the rear of the fuel-chamber, formed by the inner water-leg section, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of the subscribing witnesses.

BENJAMIN HERSHEY.

Witnesses:

GEO. P. GRIFFITH,

D. E. BURTON.