J. Eaton.

Steam Boiler.

No. 91,316. Patented Jun. 15, 1869.

Fig: 2

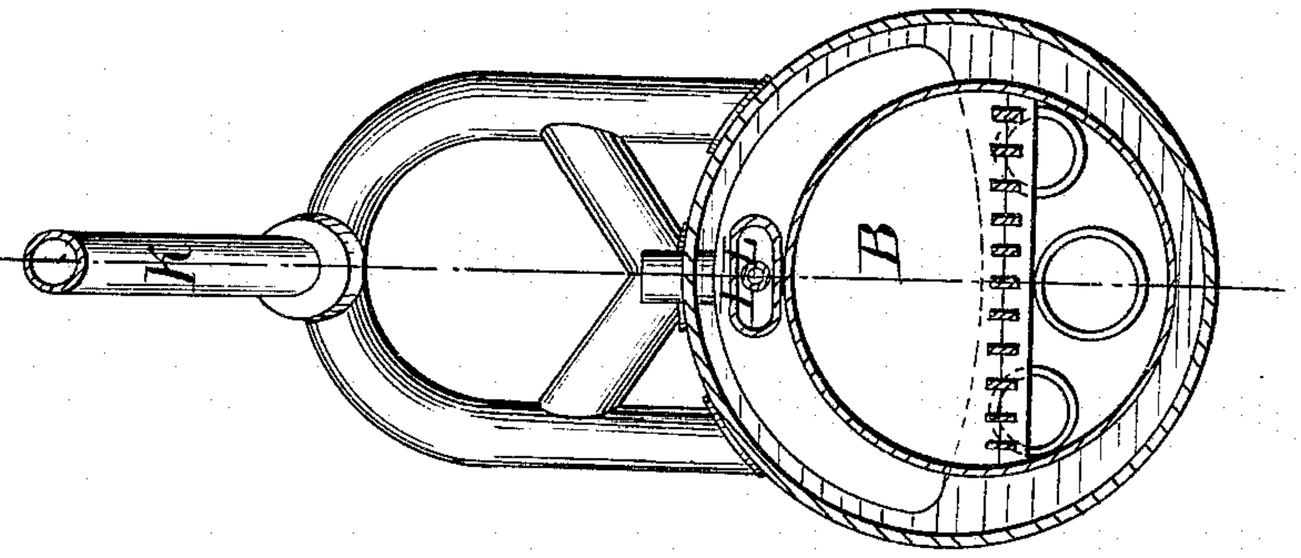
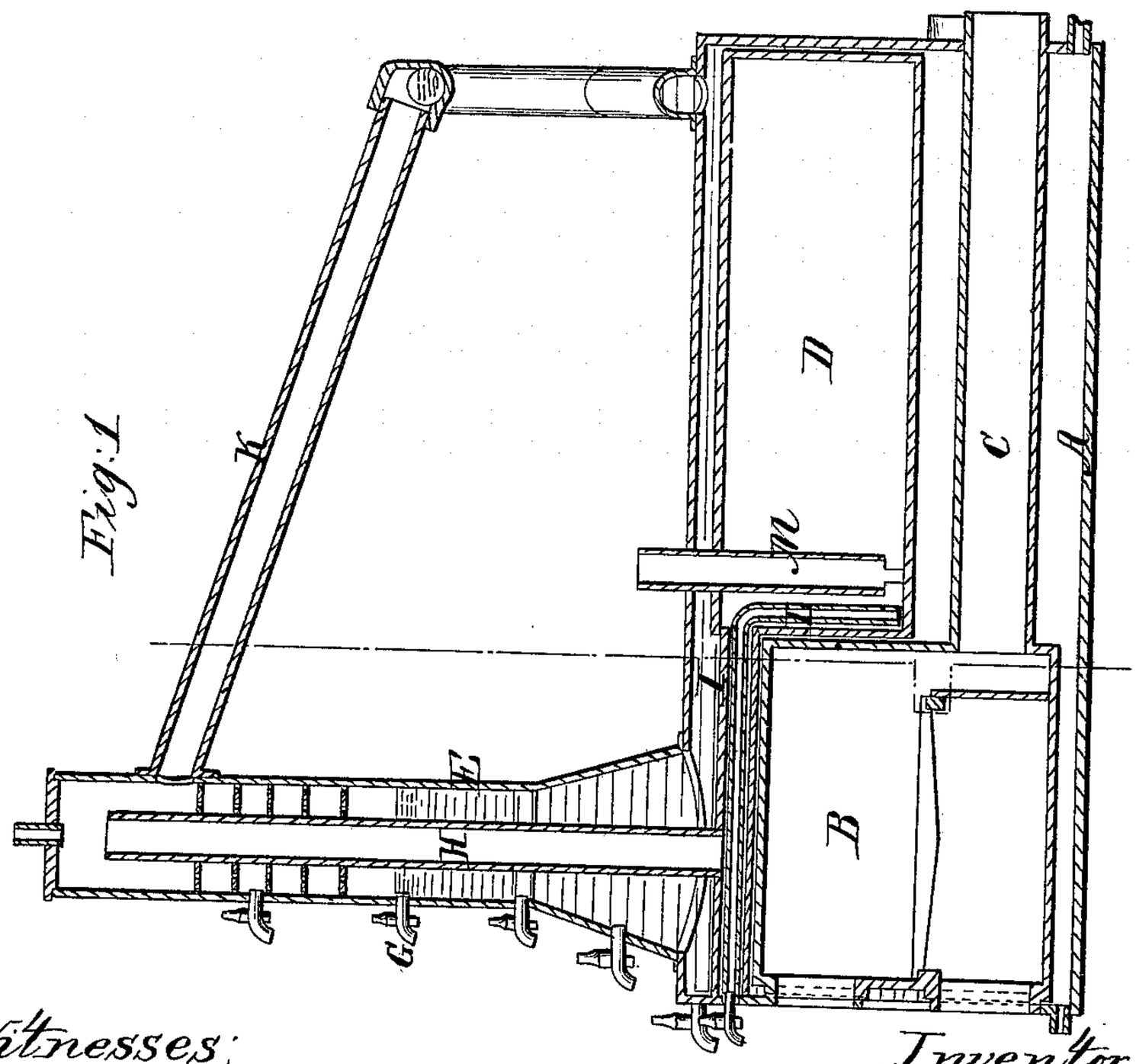


Fig: 1



Witnesses;

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JAMES EATON, OF BRIDGEPORT, ILLINOIS.

Letters Patent No. 91,316, *dated June* 15, 1869.

IMPROVEMENT IN STEAM-GENERATORS.

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, JAMES EATON, of Bridgeport, in the county of Lawrence, and State of Illinois, have invented a new and useful Improvement in Steam-Boilers; 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 drawings, forming part of this specification.

This invention relates to improvements in steam-boilers, intended to provide boilers which may be used for agricultural purposes, where they are required to pass over uneven ground without exposing the flues or other parts to the fire uncovered by water; also to provide a more safe and economical boiler than those now in use.

It consists in providing a steam-chamber within the shell of the boiler in a manner to be completely enveloped by the water, and an elevated water-chamber communicating with the water-space, so arranged that the boiler may be kept full of water at all times, the water being maintained at such a height in the said elevated chamber that no change of position, such as is likely to occur to the boiler, will cause any part of the fire-surface or steam-chamber to become uncovered, and provided with means for conveying the steam to the said chamber, as will be hereinafter specified.

Figure 1 represents a longitudinal sectional elevation of a boiler, constructed upon the principle of my invention, and

Figure 2 represents a transverse section of the same.

Similar letters of reference indicate corresponding parts.

A represents the outer shell of a boiler, which may be of any preferred construction, and provided with the usual supply and blowing-off pipes.

B represents the fire-box, and C the flues, which are here represented as terminating at the rear end of the boiler. I prefer, however, to have them return, and arrange the smoke-stack to encircle the elevated water-chamber, which will be hereinafter explained.

D represents a steam-chamber, made of sheet-metal, and arranged within the shell of the boiler, and preferably as large as it may be, allowing a slight water space between it and the outer shell.

E represents an elevated water-chamber, rising up from the top of the boiler, preferably at the front end, and provided with any suitable number of perforated dividing-plates F near the top, designed to prevent the water from splashing upward in the said chamber by the motion of the boiler, as on a traction-engine, or a locomotive.

The said chamber is also provided with water-gauge cocks G.

H represents a vertical pipe, rising within the water-chamber to near the top, and open thereat, and communicating through a horizontal pipe, I, within the shell of the boiler, with the steam-chamber D.

A branching-pipe, K, having two or more connections with the rear end of the boiler, leads into the top of the water-chamber, to facilitate the escape of steam as it is generated in the boiler, to the pipe H, for finding its way to the steam-chamber D.

A pipe, L, leads from the steam-chamber D, near the bottom thereof, to the exterior of the boiler, where it is provided with a water-cock, whereby the water which may accumulate in the steam-chamber by condensation or otherwise, may be drawn off.

M represents another steam-pipe leading from the chamber D, through which the steam may be conveyed either to the safety-valve or to the engine, as may be preferred.

It will be observed that by this plan the boiler, being kept sufficiently full to maintain a few gallons of water in the elevated chamber, no part of the boiler can be uncovered to the fire, which is a frequent cause of explosion, and consequent damage, to which boilers intended for traction-engines would be especially liable according to the common construction.

The chamber D may be made of comparatively light and thin material, as the pressure will be equal or nearly equal externally and internally. It may serve also as a means of strengthening the outer shell by stay-bolts suitably arranged, or stay-bolts from the fire-plate may extend through it to the end of the boiler.

The fire-box may be made much larger by this plan, proportionably to the size of the boiler, owing to the fact that no steam-space is required to be reserved in the shell of the boiler.

It will be also observed that by this plan, because the steam cannot be brought into contact with overheated surfaces of iron, no gas, or at most but very little, can be generated, as now often happens; but if by any possibility it should be produced, the reservoir D cannot become sufficiently heated to cause ignition.

As a greater measure of safety, however, I have arranged the steam-pipe M so as to take the steam from the bottom of the reservoir, whereby if any gas exist, which, being heavier than steam, and consequently falling to the bottom, it will be forced into the pipe, and thereby carried off.

I do not desire to limit myself to any particular arrangement of boilers in applying the improvements herein described; but

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

1. The combination, with steam-boilers, of an elevated water-chamber and an internal steam-chamber, substantially as specified.

2. The combination, with the elevated water-cham-

ber, of the perforated plates, substantially as specified.

3. The combination, with the water-chamber F and steam-chamber D, of the pipe H, substantially as specified.

4. The combination, with the steam-boiler and the elevated water-chamber, of the steam-pipe K, substantially as specified.

5. The combination, with a steam-chamber, D, enclosed within the shell of the boiler of the pipe L, substantially as specified.

6. The combination, with a steam-chamber adapted for delivering the steam from near the bottom of a delivery-pipe, M, arranged for receiving the steam therefrom, substantially as specified.

Witnesses: JAMES EATON.

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