

(No Model.)

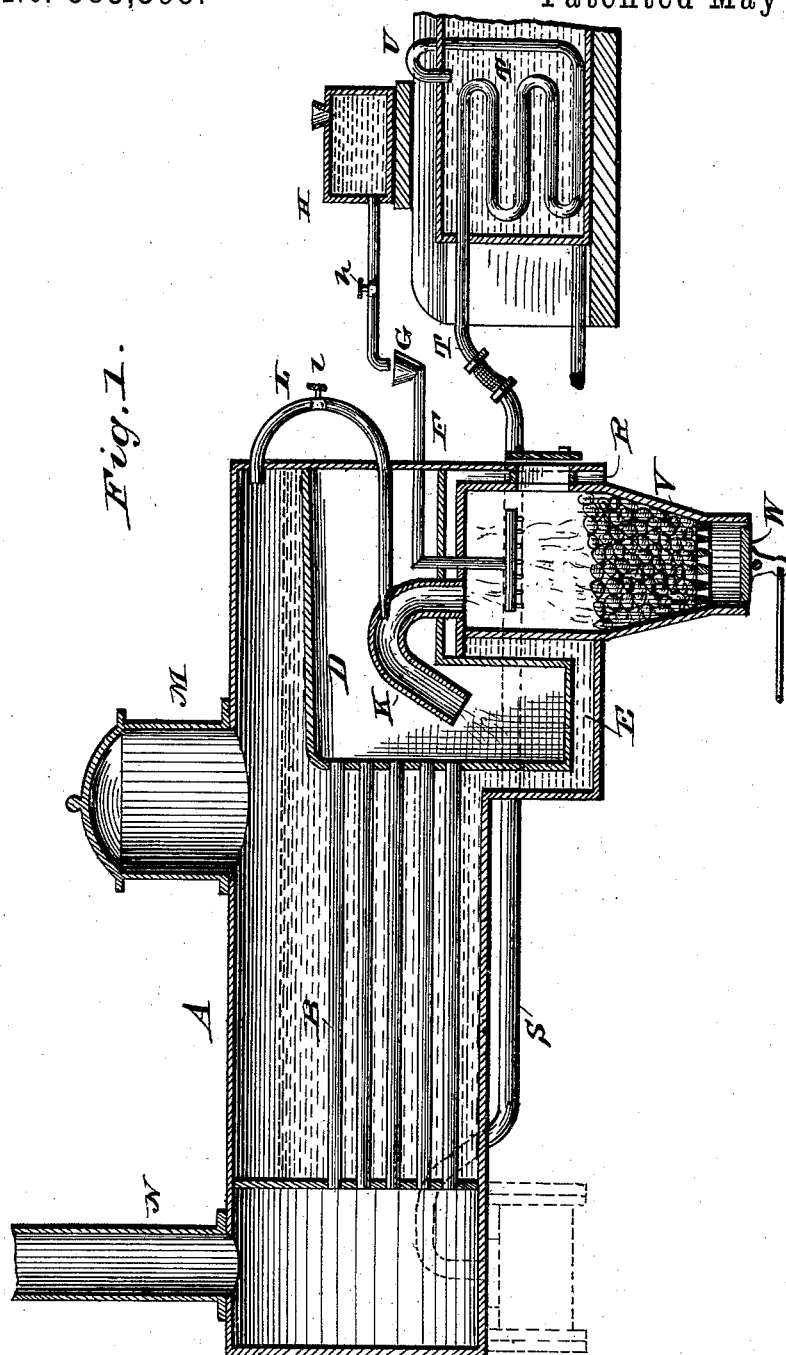
2 Sheets—Sheet 1.

A. C. HUIDEKOPER.

GAS GENERATOR FOR LOCOMOTIVES.

No. 383,395.

Patented May 22, 1888.



WITNESSES.

Phil Ostrick.
F. T. F. Johnson.

INVENTOR.

Arthur C. Huidekoper.

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Attorney

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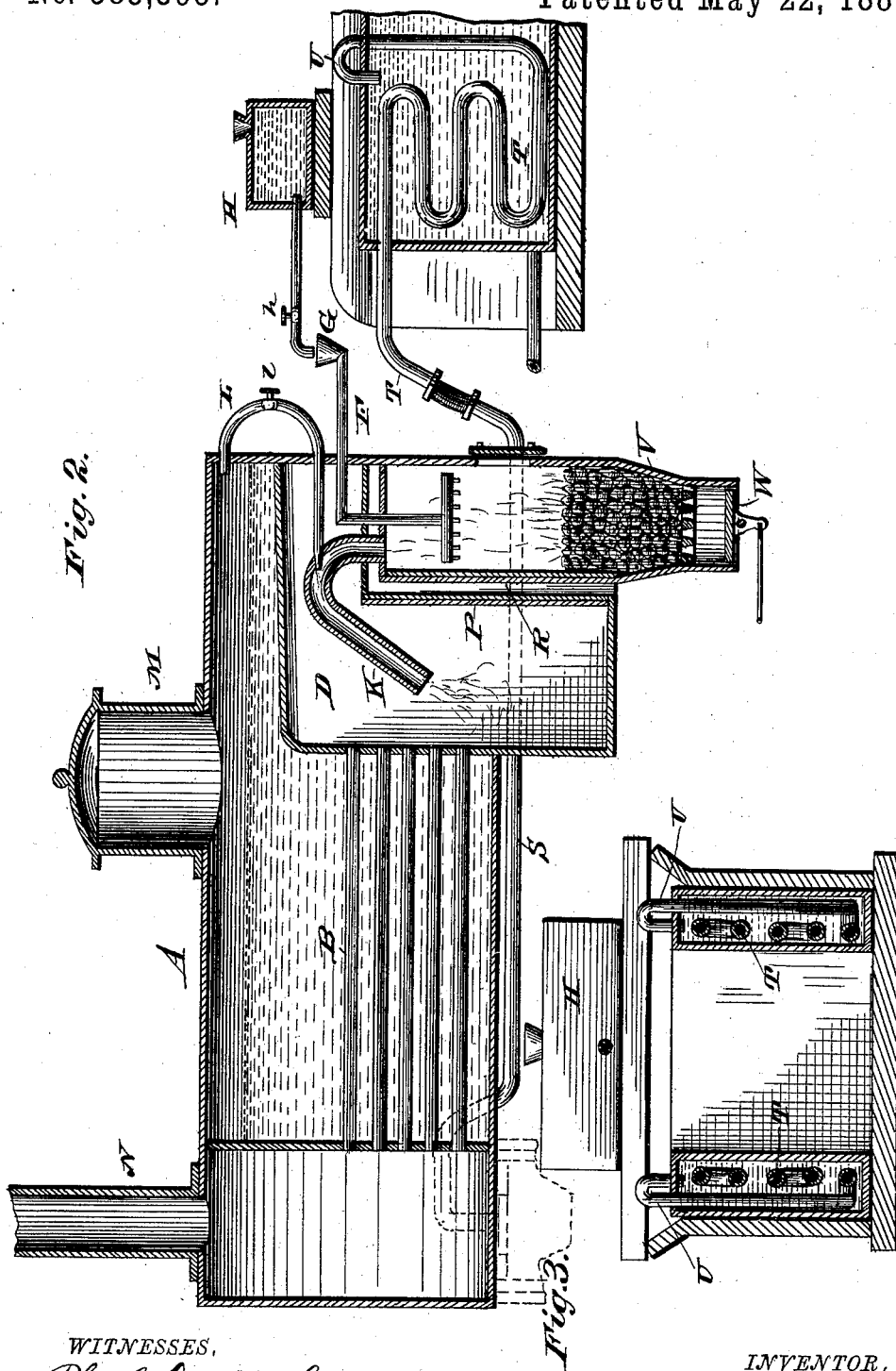


Fig. 2.

Fig. 3.

WITNESSES.

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UNITED STATES PATENT OFFICE.

ARTHUR C. HUIDEKOPER, OF MEADVILLE, PENNSYLVANIA.

GAS-GENERATOR FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 383,395, dated May 22, 1888.

Application filed April 28, 1887. Serial No. 236,402. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR C. HUIDEKOPER, of Meadville, in the county of Crawford and State of Pennsylvania, have invented certain new and useful Improvements in Gas-Generators for Locomotives; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figure 1 is a vertical longitudinal section of a locomotive boiler and tender embodying my invention. Fig. 2 is a similar view showing a modification of the same. Fig. 3 is a transverse vertical section taken through the tender.

My invention relates to certain novel improvements, which are designed for practically utilizing what is known as "fluid-fuel" as a heating agent for locomotive engines, which improvement will be fully understood from the following description, taken in connection with the annexed drawings.

In the accompanying drawings, the letter A indicates the shell of a boiler of any approved construction; B, the flues of the same, leading from the combustion-chamber to the smoke-box, and D the combustion-chamber. The lower part of said combustion-chamber, in connection with the shell of the boiler, is formed with water-spaces or water-legs E, surrounding the combustion-chamber, as shown in Fig. 1 of the drawings, so as to secure the full effective heat of the fuel in the generation of the steam.

The letter F indicates a pipe leading into the upper part of the fire box or chamber V from a funnel, G, located outside of the furnace and arranged to receive liquid hydrocarbon from a suitable source of supply, the said source in the present instance consisting of a tank, H, located on the tender of the engine, and having a pipe extending therefrom over the furnace, so as to supply the fluid-fuel to the same, the pipe being provided with a stop-cock, *h*, by which the flow of the fuel may be regulated.

From the upper part of the fire box or chamber extends a goose-neck pipe, K, into the combustion-chamber of the furnace, and into said goose-neck pipe extends one end of a pipe,

L, from the steam space or dome M of the boiler, whereby a forcible jet of steam may be injected into said goose-neck pipe, so as to carry over the gases generated in the fire box or chamber when they are met by fresh air, causing rapid and intense combustion. Said pipe L has stop-cock *i* in same to regulate supply of steam. The intensely-heated products thus generated pass through the boiler-flues to the smoke-stack N, where they escape, as usual, parting on their way with the material portion of its effective heat to the water in the boiler for the generation of steam therein.

In the modification shown in Fig. 2 of the drawings an ordinary locomotive-boiler is represented. To adapt my invention to the same, I locate in the combustion-chamber thereof a fire-box, in which the gaseous fuel is generated. This fire-box is so constructed and arranged as to occupy the front portion of the combustion-chamber of the furnace, and is preferably made of a metallic shell and lined with refractory material, between which and the outer wall of the combustion-chamber is left a space, R, open at the bottom and at the top, by means of which fresh air is supplied to the combustion-chamber to support combustion of the ignited gases therein. The heated products of combustion pass through the boiler-flues, as usual, and escape through the smoke-stack.

The letter S indicates two pipes which lead from the exhaust sides of the cylinders. These usually terminate in the smoke-stack to form a draft in the same and through the furnace. In the present instance, however, the draft being produced by the injection at the rear of the furnace, the forward draft is unnecessary and the waste steam is utilized to heat the feed-water to be supplied to the boiler. To accomplish this, the waste steam is carried out by means of pipes T back to the tender, where the said pipes are coiled in the water-reservoir, so as to heat the water therein previously to supplying it to the boiler. To further utilize the waste steam, it is discharged into the tank of the tender by means of a pipe, U, leading from the coil. The water of condensation is also forced into the tender through the pipe.

Instead of the steam-blast induced through the pipe leading from the steam-space of the

boiler, the pipe may be provided with a valved branch leading from the air-brake reservoir of the engine, by means of which a blast of air may be introduced into the goose-neck pipe to force the gases and air into the combustion-chamber of the furnace and produce the necessary draft through the same.

In both forms of the furnace the fire box or chamber at its lower end is provided with a metallic skirt, V, which is preferably in the form of an inverted frustum of a cone, and at its lower edge is provided with a rigid damper or valve, W, which may be operated by a suitable rod to control admission of air from below, so as to regulate the combustion of the fuel.

The operation of my invention will be readily understood from the above description without further explanation.

The oil-tank may be located within the tender-reservoir, and this form of construction will be preferable in most instances where the engine is used in very cold weather, as the heat from the tank will keep the oil warm and in proper fluid condition.

It will be observed from the foregoing description of my invention, first, that I take the common steam directly from the head of the boiler and inject this steam into the bend of pipe K, so as to produce, by impact of the steam against the outflowing gases of combustion, a positive draft into the combustion-chamber from the fire-box. This siphon-shaped pipe K is directed downwardly for the purpose of producing a whirl of the heated gases and to effect a perfect combustion thereof in the chamber D before they pass through the boiler-flues B, and also to cause practically a uniformity of draft through all of said flues. It will also be observed that I utilize the exhaust-steam from the engine for warming the feed-water in the tender, and also for keeping fluid the liquid-fuel in the tank H, which tank is provided with a cock located conveniently for enabling the engineer to regulate the supply of said fuel.

I do not broadly claim under this applica-

tion the feature set forth in my preceding application, Serial No. 231,111, allowed March 30, 1887.

Having described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination, with a tubular steam-boiler having a combustion chamber, of a fire-box, a flue leading out of the top of the fire-box and directed downward and forward in said chamber, and an injecting-pipe leading from the steam-space of the boiler into the bend of said flue and provided with a regulating-valve, all constructed and arranged substantially as and for the purpose described.

2. The combination, with a tubular steam-boiler having a combustion-chamber, of a fire-box located in said combustion-chamber, and having a downwardly-constructed extension, V, provided with a grate and a valve, a liquid hydrocarbon injector in said fire-box, a siphon-shaped outlet pipe or flue leading therefrom and into the combustion-chamber, and an injector leading from the steam-space of the boiler into said siphon-pipe, all constructed and arranged substantially as and for the purpose described.

3. The combination of a tubular steam-boiler having a combustion-chamber, a fire-box located therein, a flue-pipe connecting the said fire-box and combustion-chamber, and a steam-pipe leading from the boiler-space to said flue-pipe, with a liquid-fuel reservoir provided with a valved delivery-spout, and a pipe adapted to receive the liquid-fuel entering the fire-box and provided with a spray pipe or head located inside the fire-box, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

A. C. HUIDEKOPER.

Witnesses:

T. H. ALEXANDER,
M. P. CALLAN.