W. M. KILGORE.

Steam-Boilers.

No. 207,662. Patented Sept. 3, 1878.

Fig. 1.

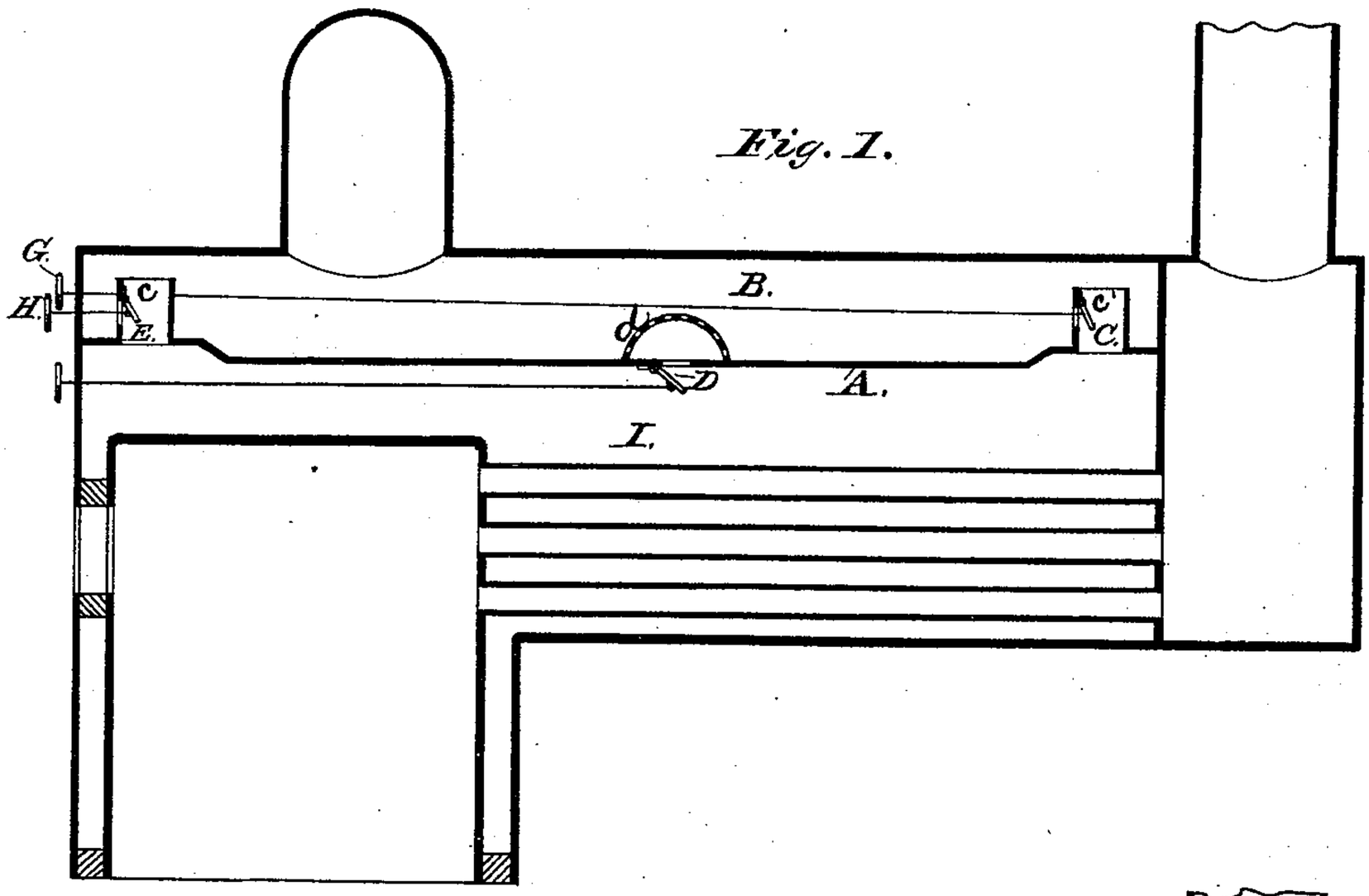


Fig. 2.

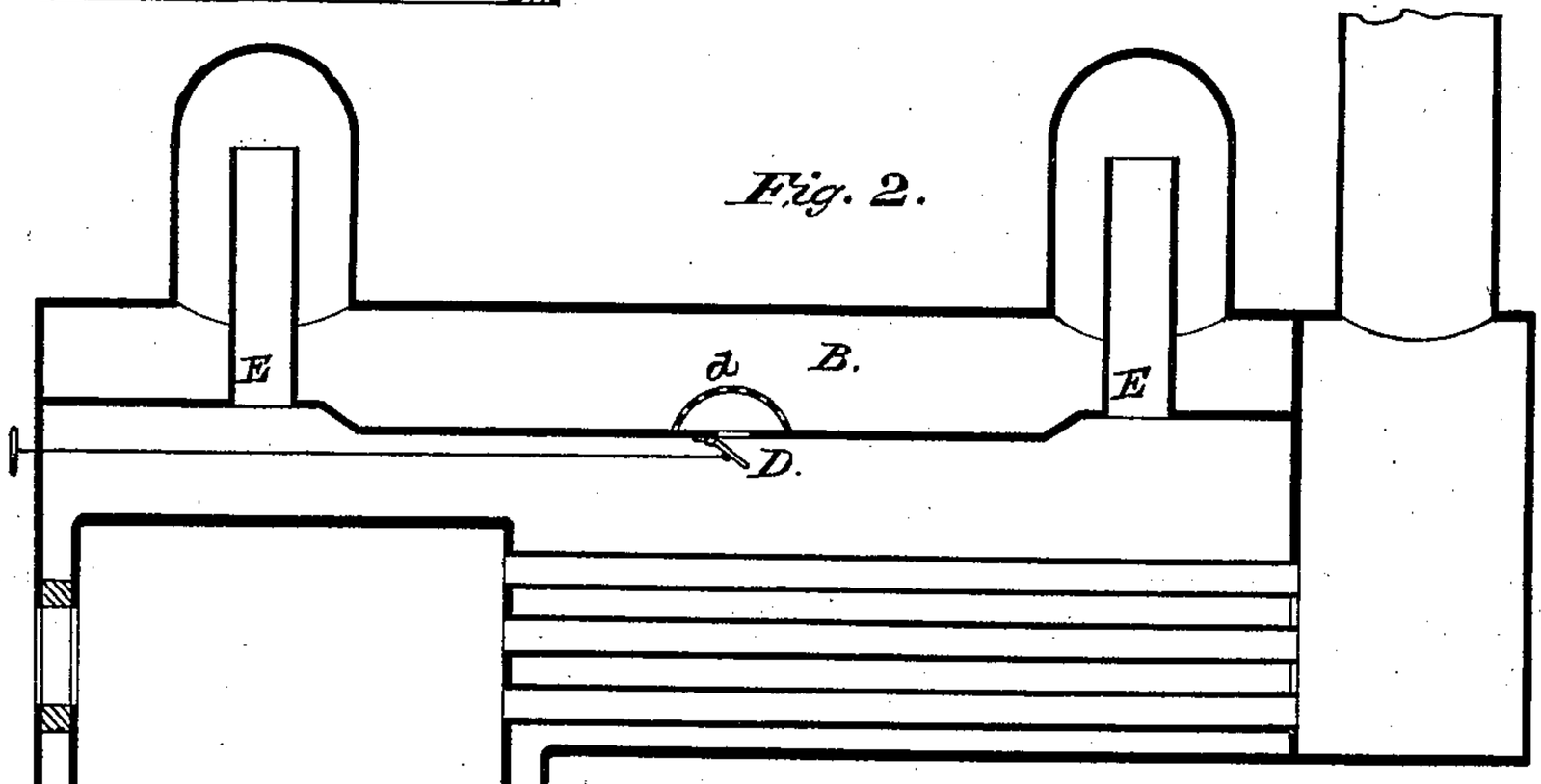
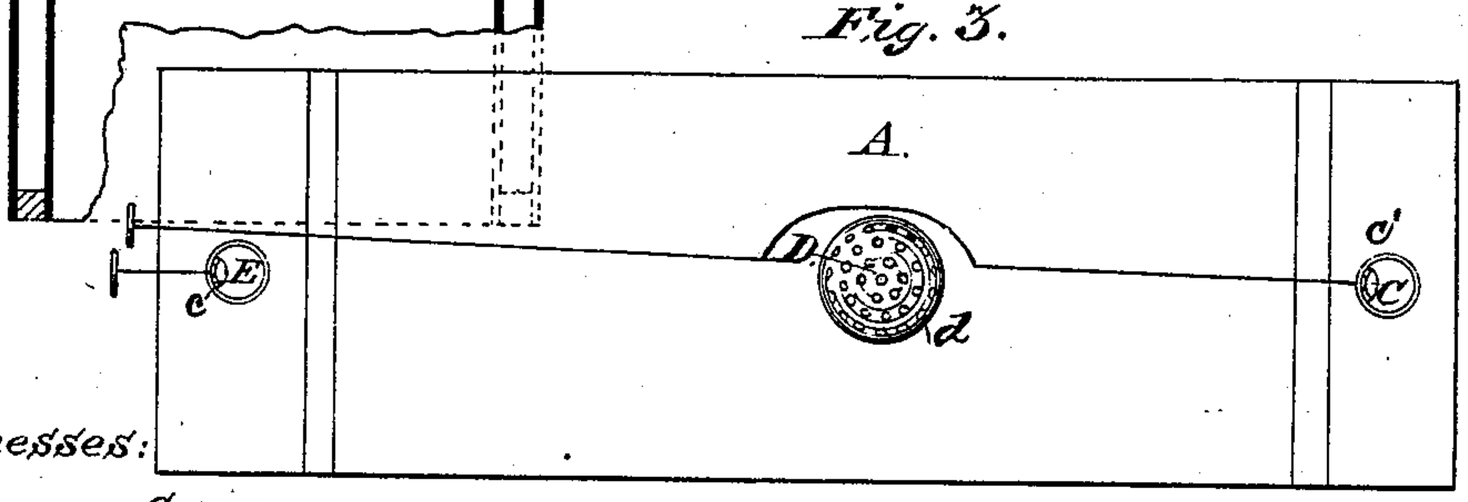


Fig. 3.



Witnesses:

Robt Humphreys

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Inventor:

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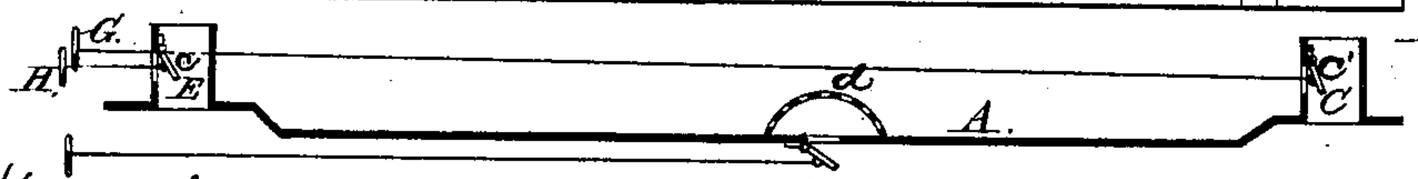
Fig. 4.



UNITED STATES PATENT OFFICE.

WILLIAM M. KILGORE, OF UNIONTOWN, OHIO.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **207,662,** dated September 3, 1878; application filed May 16, 1878.

To all whom it may concern:

Be it known that I, WILLIAM M. KILGORE, of Uniontown, county of Belmont, and State of Ohio, have invented a new and Improved Method of Maintaining Water-Level 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 which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and which form part of this specification, in which—

Figure 1 illustrates a longitudinal vertical section of a locomotive-boiler, showing my invention applied thereto. Fig. 2 also shows a longitudinal vertical section of a locomotive or land boiler provided with two steam-domes, to which a modification of my improved separating-plate is applied, the inlet-pipes being without valves. Fig. 3 plainly shows a plan view of the plate representing the two inlet-valves and the cage or guard for preventing extraneous matter entering into the steam-space, and also for the exit of water that is carried over with the steam; and Fig. 4 shows a side elevation of the separating or safety plate, with its pipes and valves detached from the boiler.

My improvement relates to that class of inventions known as "devices for maintaining water-level in steam-boilers;" and as heretofore constructed the boiler is divided vertically in sections by partitions transversely arranged, with an opening in the top of each partition for the communication of steam; but such construction is objectionable, inasmuch as when the boiler is descending a steep grade the water flows to the front portion, thus leaving the crown-sheet of the fire-box exposed to the action of the flame, which, as is well known, produces disastrous results. The same may be said of the tubes when ascending a steep grade.

The invention is more particularly applicable to road, agricultural, and marine boilers; and it consists in what I will hereinafter denominate "a separating-plate," located about the water-line in the boiler, dividing the boiler into separate sections by placing longitudinally and horizontally the said plate or partition, extending from one end of the boiler to the other, to prevent, while ascending or descending inclines, the body of water from flowing to one or the other end, and to keep it as much as possible in equal distribution through the whole length while the boiler is on a slope. When on a level the water adjusts itself.

Various means may be employed for communication between the lower and upper sections for the inlet of steam and exit of water from the steam-chamber; but I will illustrate my improvement by showing ordinary pipes extending up into the steam-space from the separating-plate, said pipes being provided with valves of ordinary or approved construction. These valves may be operated from the cab or fire-box end of the boiler by the attendant.

Referring to the drawings hereto annexed, A represents the separating-plate dividing the water and steam space its entire length. This plate is provided with two or more pipes, C and E, extending up into the steam-space for the liberation of the steam from the water-space below the plate. These pipes are provided with valves *c*, of any preferred pattern, and are intended to be shut when the boiler is descending or ascending inclines. For instance, when ascending the valve at the fire-box end is closed to prevent the water from flowing back uncovering the tubes; and when descending the valve *c'* is shut to prevent the water flowing from the crown-sheet. Although the apparatus will operate independent of the valves, as will presently appear, the valves are operated by valve-rods G and H. Near the ends the plates are made upwardly inclined, and decline slightly toward the middle of the plate, so that any water or sediment that may enter with the steam will readily pass out through valve D, centrally located on the plate. This valve D is shown as opening downward, so that the pressure or currents of the water from either end of the boiler would automatically keep it closed. When the boiler is on a level this valve, as well as the others, may remain open. A perforated cage or guard, *d*, is placed over this valve D for the purpose of preventing sticks, sediment, foam, or any other extraneous matter from entering the steam-space through this aperture, it being nearer the surface of the water than any other portion of the plate.

In the modification it will be observed that the inlet-pipes require no valves, for the reason

that they run up into domes prepared for them, and so high that the water in the boiler will not overflow them. With this arrangement only the central valve will have to be looked after, saving the trouble, expense, and the cutting of so many holes in the boiler-front.

Many other modifications may be adopted without departing from the spirit of my invention.

It will be very readily seen that my improvement is capable of performing other very important functions—*i. e.*, that of a "separator."

It is well known among engineers that when very muddy water is used, and also salt-water, the boiler foams very much, so much so that water is carried over with the steam to the cylinders, and often the cylinders' heads are blown out. With my improvement this danger is avoided, and clear dry steam is furnished to the engine.

This separating-plate also serves as a good stay or brace for the boiler, both as against explosion and collapse. It may also receive stay-bolts from the top or bottom of the boiler. Then the boiler is more secure and solid, which is particularly necessary when the boiler forms the frame or bed of the engine, as in portable or road engines.

The said separating or safety plate may be made of any well-known or suitable material, and, as the pressure is equal on both sides of the plates, only light plates may be used, except when it may be required for staying the boiler, as before alluded to.

The boiler, of course, will be provided with the usual fire-box, smoke-box, uptake, safety-valves, &c., and I will not, therefore, describe such.

Having now fully described my invention and the mode of operating the same, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a steam-boiler, the separating-plate A, with its pipes C E and valve D, adapted to prevent the body of water flowing from one end of the boiler to the other, substantially as herein described.

2. The combination, in a steam-boiler, of the separating-plate A, steam-inlet pipes C E, valves *c* and *c'*, and outlet-valve D, constructed and arranged to operate in the manner set forth and described.

3. The combination, in a steam-boiler, of the separating-plate A, raised at both ends and inclining from the middle, and provided with the pipes and valves, constructed and operating as herein described.

4. The combination, with a steam-boiler, of the separating or safety plate A, provided with inlets for steam and outlets for water, the latter being provided with a guard or cage, *d*, for the purpose set forth.

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