

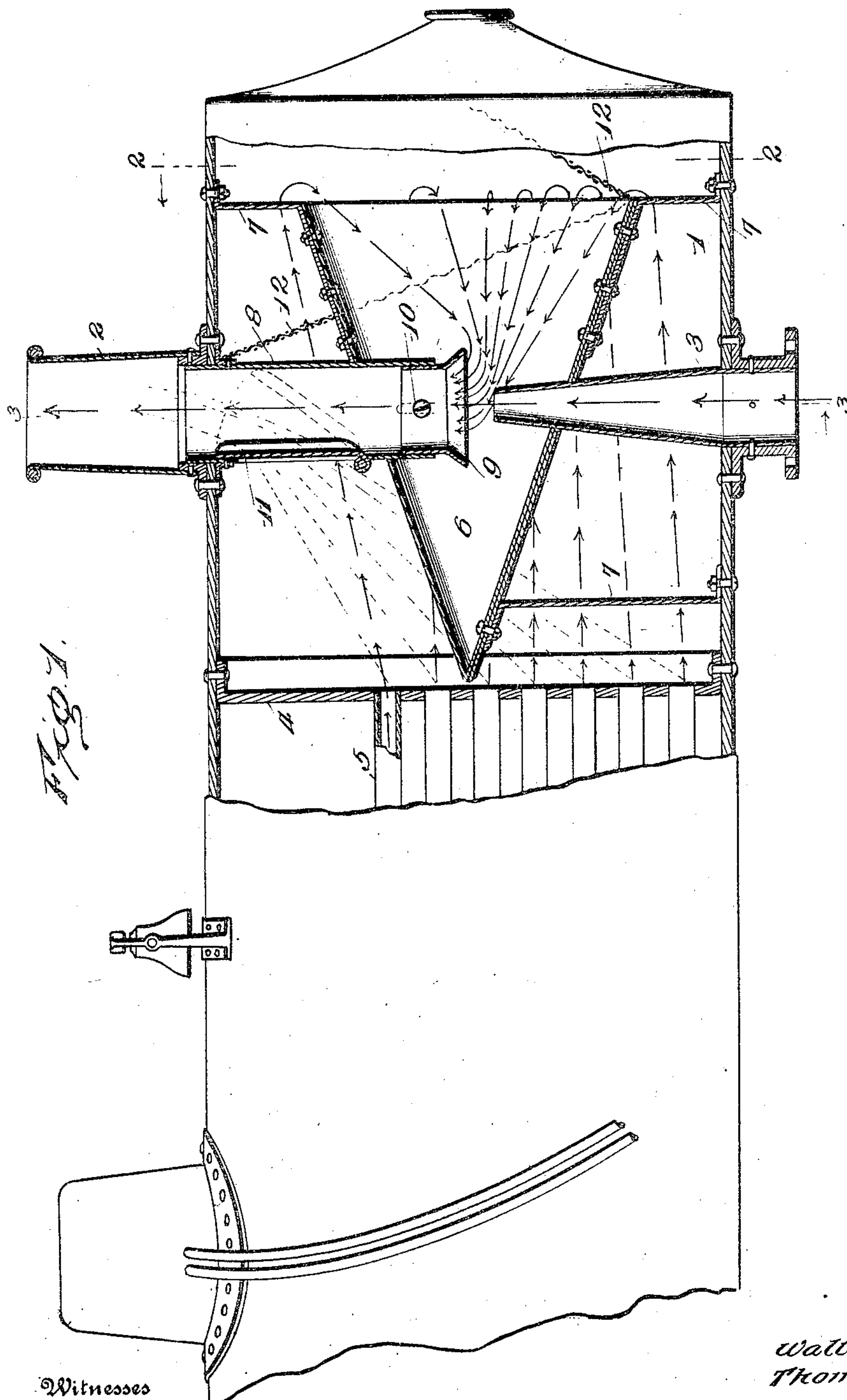
No. 887,278.

PATENTED MAY 12, 1908.

W. A. SKINNER & T. F. CAIN.
LOCOMOTIVE DRAFT REGULATOR.

APPLICATION FILED AUG. 24, 1907.

2 SHEETS—SHEET 1.



Witnesses

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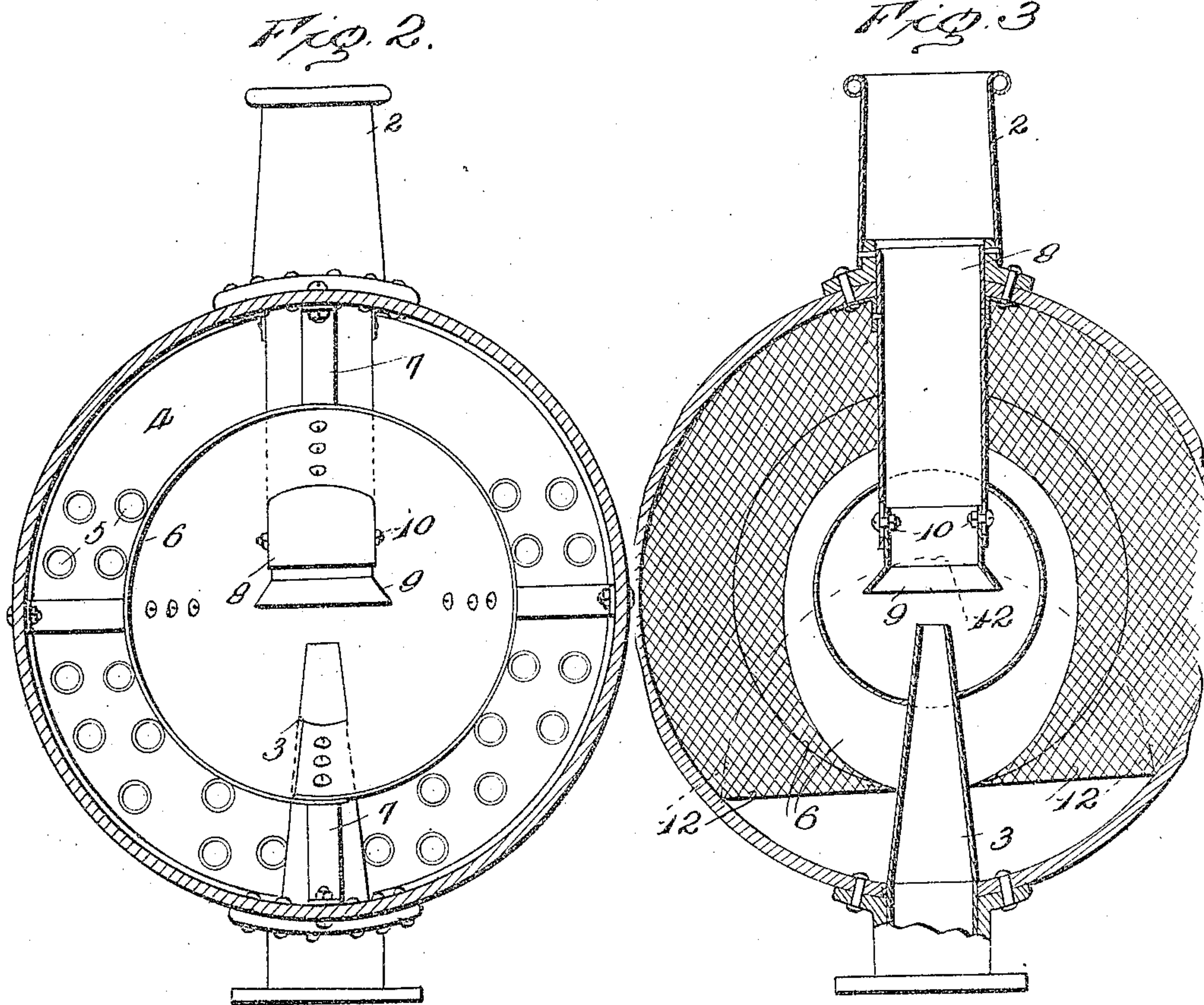
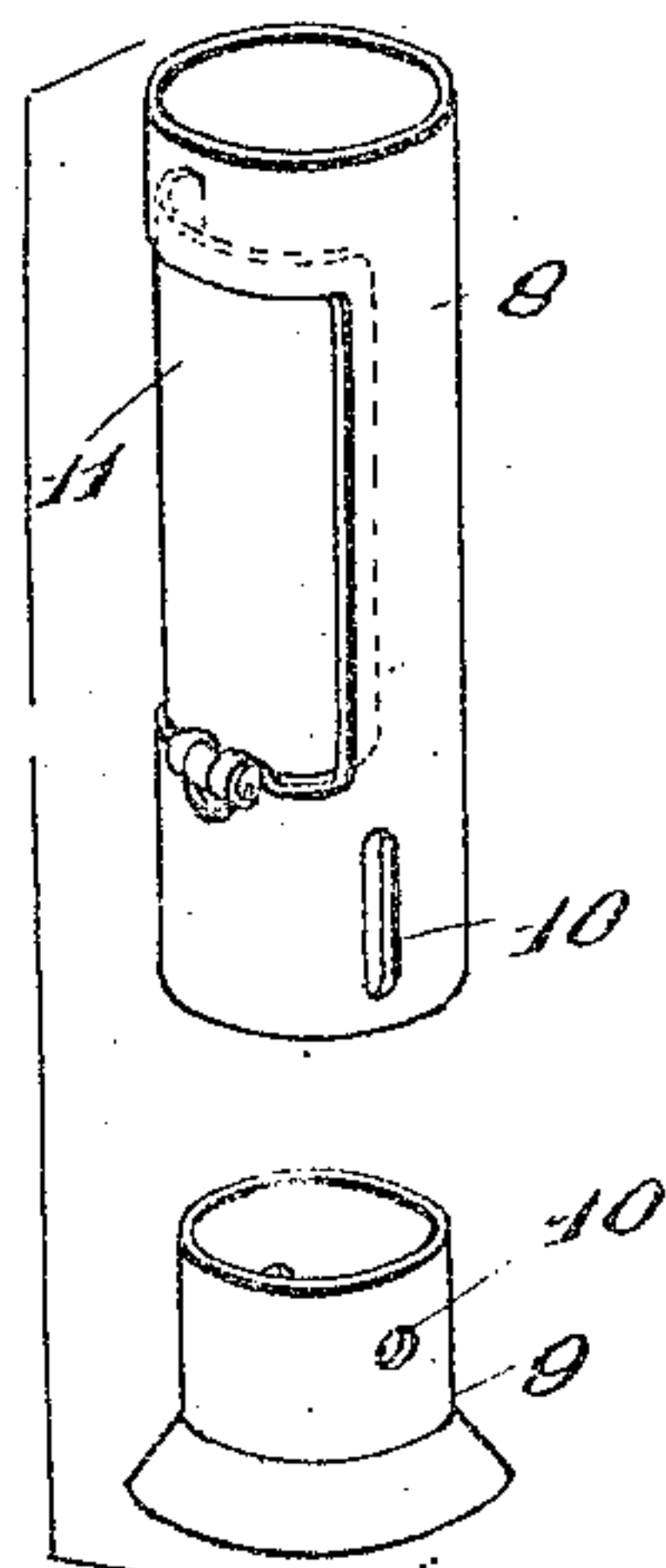


Fig. 4



Witnesses

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UNITED STATES PATENT OFFICE.

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LOCOMOTIVE DRAFT-REGULATOR.

No. 887,278.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, WALTER A. SKINNER and THOMAS F. CAIN, citizens of the United States, residing at Moberly and Montgomery City, respectively in the counties of Randolph and Montgomery and State of Missouri, have invented certain new and useful Improvements in Locomotive Draft-Regulators, of which the following is a specification.

This invention contemplates certain new and useful improvements in apparatus for regulating the draft in locomotive boiler furnaces, and the invention has for its primary object an improved locomotive draft regulator which will distribute the heat from the furnace or fire-box evenly through the flues of the boiler, thereby effecting the generation of steam very quickly and at a lower degree of heat in the fire-box, doing away with the necessity of a fierce or excessive fire to heat several flues owing to the fact that the products of combustion pass through only several flues, and thereby effecting economies in the consumption of the solid or liquid fuel employed, as well as resulting in lengthening the life of the boiler flues, for the reason that each flue will accomplish its required work with the fire lower than would otherwise be the case, and in other economic advantages.

With this and other objects in view, as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements, and combinations of the parts that we will hereinafter fully describe and then point out the novel features in the appended claims.

For a full understanding of the invention, reference is to be had to the following drawings, in which:—

Figure 1 is a longitudinal sectional view of a locomotive boiler furnace equipped with our invention; Fig. 2 is a transverse sectional view thereof on the line 2—2 of Fig. 1; Fig. 3 is a similar view on the line 3—3 of Fig. 1; and Fig. 4 is a detail perspective view of the draft pipe.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the numeral 1 designates the smoke-box or front end of a locomotive, 2 the stack thereof, 3 the exhaust nozzle, 4 the flue sheet, and 5 the flues.

In carrying out our invention, we mount

within the smoke-box, a funnel 6 with its smaller end or apex contiguous to the flue sheet. The said funnel 6 is held in a substantially horizontal position and substantially concentrically of the smoke-box and spaced from the walls thereof, by means of braces or metallic straps 7, as clearly illustrated in the drawings.

The exhaust nozzle 3 projects upwardly into the funnel 6 and terminates preferably at about the center of the funnel, considered vertically. The draft pipe 8 extends downwardly from the stack 2 into the funnel 6 above and preferably in concentric relation with the exhaust nozzle 3, being preferably spaced, as a whole, from the tip thereof. Forming practically a part thereof, or an extension of, the draft pipe 8, is a thimble 9 which is preferably provided with a flared lower end as shown and which is secured for a vertical adjustment within the lower end of the pipe 8 by means of the ordinary vertical slot and bolt connection 10.

A door or damper 11 is hinged at its lower edge, preferably to the outer side of the draft pipe 8 and is designed to extend upwardly within the said pipe so as to serve as a closure for an opening formed in the rear side of the latter. The said damper 11 is so hinged as to have a tendency to fall by its own weight across the flue or passage formed by the pipe 8 so as to contract or obstruct such passage while the same time affording a direct communication between the stack and the smoke-box.

12 designates screens of wire mesh or the like designed to prevent sparks from being thrown out.

In the practical operation of our improved draft regulating apparatus, when the locomotive is running, the exhaust steam issuing from the nozzle 3 and up through the draft pipe 8 and out of the smoke stack 2 will produce a forced draft embodying as a feature the suction of the products of combustion around the outer edge of the funnel 6 and into the latter, and as a consequence, the draft will be evenly distributed. The force of the steam passing upwardly through the draft pipe 8 will tend to hold the damper 11 in closed position, thereby cutting off all direct communication between the stack and the flues. When the locomotive is not running and is therefore not exhausting up the stack 2, the damper 11 will fall inwardly of its own weight and thereby establish direct

communication between the flues and the smoke stack and afford effective natural draft, the smoke and other products of combustion passing upwardly through the opening in the draft pipe instead of being compelled to pursue a more circuitous course around and into the funnel 6 as they are forced to do when forced draft is maintained. Thus the engine is afforded an efficient natural draft when it is not working and the steam may be quickly generated when the fire is started, as in a round-house, doing away with the great annoyance to the engine-men of having heat and smoke leaking out around the fire-door into the cab. Preferably, as shown, the top of the damper or door 11 is higher than the highest row of flues and considerably higher than the fire-door in the engine cab.

By means of the vertical adjustment to which the thimble 9 is susceptible, the latter may be raised or lowered so as to regulate the force of the draft.

It is obvious that with a smoke-box or front end constructed in accordance with our invention, a larger exhaust nozzle can be used, than would otherwise be the case, thereby relieving the engine of what is known as back-pressure in the cylinders, and thereby also tending to increase the speed and tractive capacities of the locomotive.

While the accompanying drawings illustrate our invention incorporated in a smoke-box where the stack and draft pipe are located at about the middle thereof, it is obvious that the invention is equally applicable to those cases where the said stack and pipe are set back nearer to the flue sheet, or forwardly at a greater distance from said sheet, the only changes being necessary, if any, consisting in slightly altering the shape of the funnel.

Having thus described the invention, what is claimed as new is:—

1. In a locomotive boiler furnace, the combination with the smoke-box, exhaust nozzle, smoke stack, and draft pipe extending downwardly from the smoke stack into the smoke-box, of a funnel supported within the smoke-box with its open end foremost, the upper end of the exhaust nozzle and the lower end of the draft pipe projecting into said funnel.

2. The combination in a locomotive boiler furnace, and with the smoke-box, smoke stack, and exhaust nozzle thereof, of a funnel held in a horizontal position within the

smoke-box with its larger open end foremost, said funnel being spaced on all sides from the walls of the smoke-box, the exhaust nozzle and draft pipe projecting into the funnel. 60

3. In a locomotive boiler furnace, the combination with the smoke-box, stack, and exhaust nozzle, of a funnel supported in the smoke-box with its open end foremost, the exhaust nozzle projecting into the funnel, 65 and a draft pipe extending downwardly from the stack into the funnel and above the tip of the exhaust nozzle, said draft pipe being provided with an extensible lower end.

4. In a locomotive boiler furnace, the combination with the smoke-box, stack, and exhaust nozzle, of a funnel supported in the smoke-box with its open end foremost, the exhaust nozzle projecting into the funnel, a draft pipe extending downwardly from the 75 stack and into the funnel above the tip of the exhaust nozzle, and a flared thimble connected to the lower end of said draft pipe.

5. In a locomotive boiler furnace, the combination with the smoke-box, stack, and exhaust nozzle, of a funnel supported in the smoke-box with its open end foremost, the exhaust nozzle projecting into the funnel, a draft pipe extending downwardly from the stack into the funnel, and a damper in said 85 draft pipe outside of said funnel.

6. In a locomotive boiler furnace, the combination with the smoke-box, stack, and exhaust nozzle, of a funnel supported in the smoke-box with its open end foremost, the exhaust nozzle projecting into the funnel, a draft pipe extending downwardly from the stack into the funnel above the exhaust nozzle, said pipe being formed, outside of the funnel, with an opening, and a damper hinged 95 to the draft pipe at the said opening and arranged to fall inwardly therefrom.

7. In a locomotive boiler furnace, the combination with a smoke-box, exhaust nozzle, and smoke stack, of a funnel supported within the smoke-box with its open end foremost, the upper end of the exhaust nozzle projecting into said funnel and there being provided a passage from the interior of the funnel to the smoke stack above said nozzle. 105

In testimony whereof we affix our signatures in presence of two witnesses.

WALTER A. SKINNER. [L. S.]

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Witnesses:

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