(No Model.) 4 Sheets—Sheet 1.

C. W. HULLINGS.

LOCOMOTIVE FIRE BOX.

No. 490,629. Patented Jan. 24, 1893.

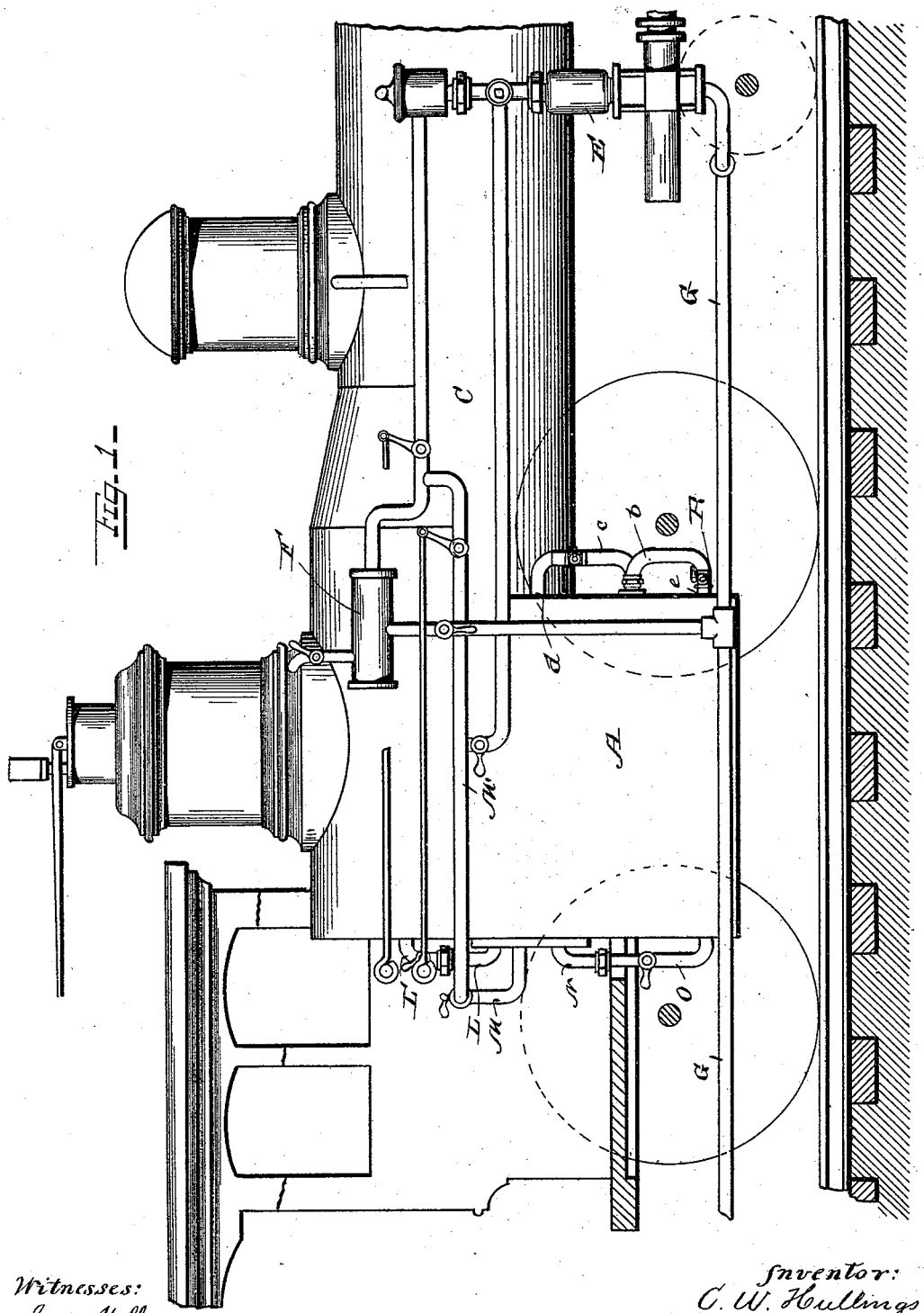

Fig. 1.

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by E. W. Anderson
Attorney:

(No Model.) 4 Sheets—Sheet 2.

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Fig. 2.

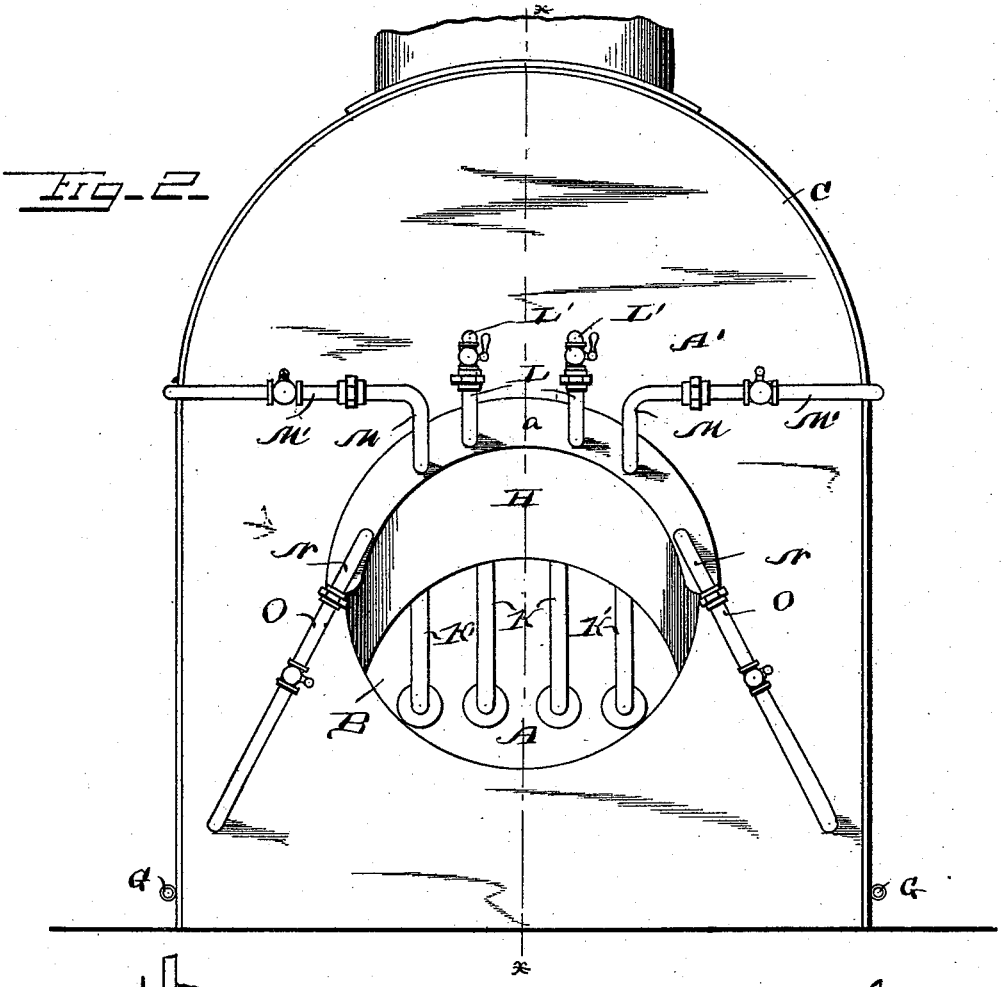
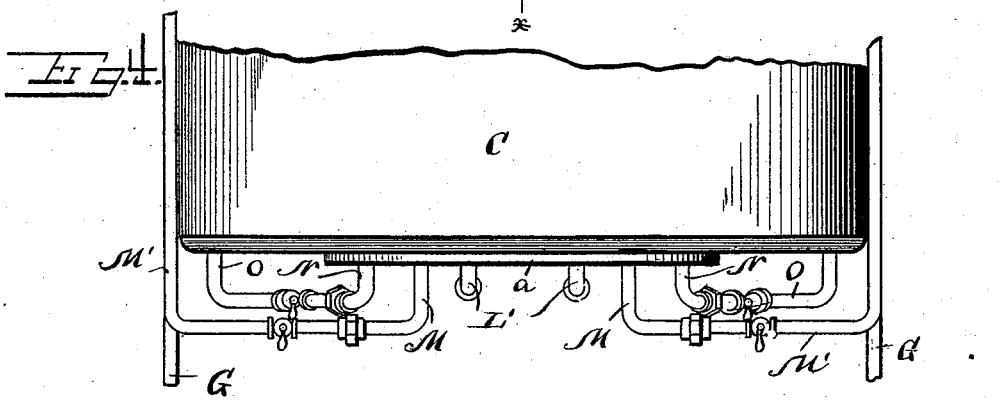


Fig. 4.



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(No Model.) 4 Sheets—Sheet 3.

C. W. HULLINGS.

LOCOMOTIVE FIRE BOX.

No. 490,629. Patented Jan. 24, 1893.

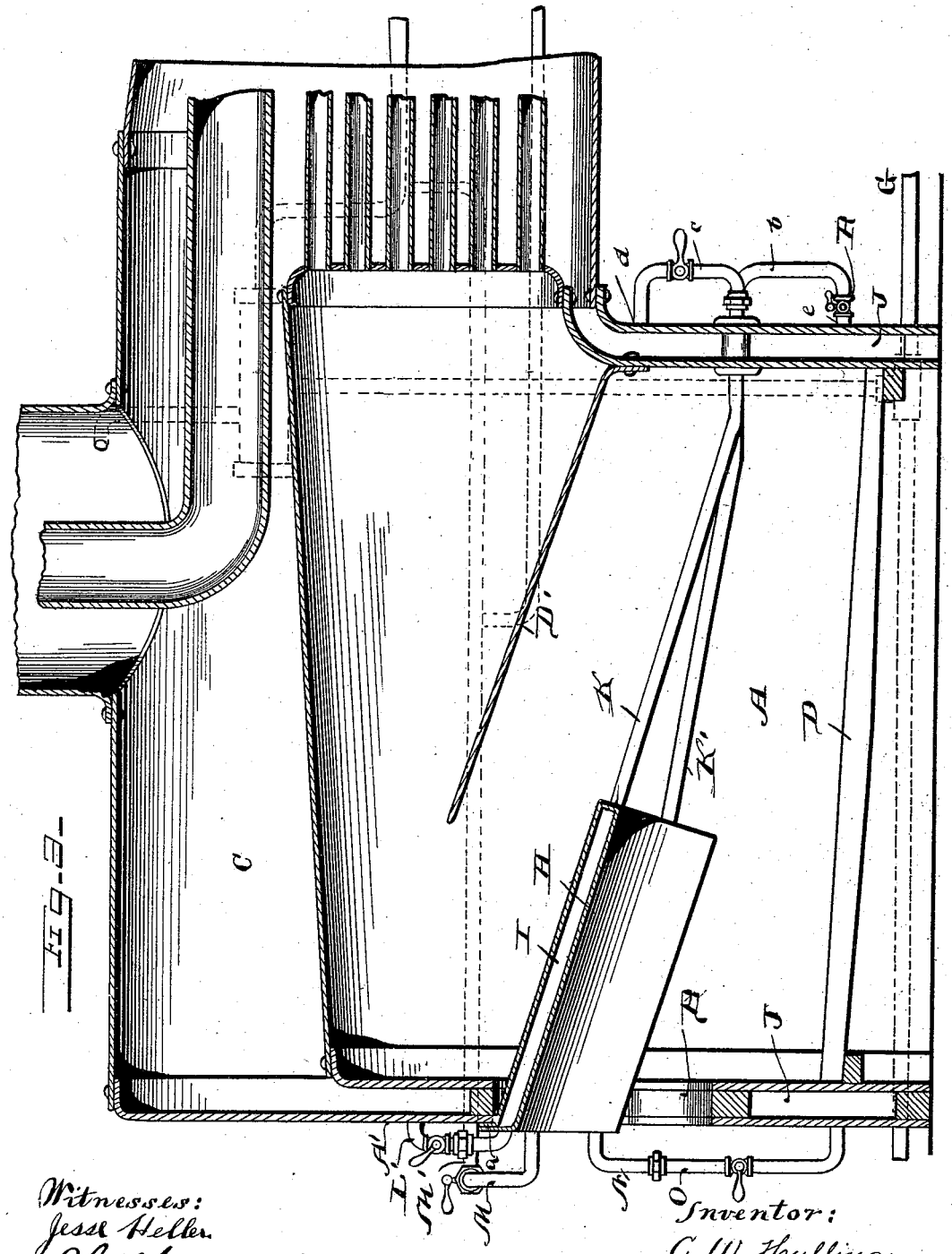

Fig. 3.

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(No Model.) 4 Sheets—Sheet 4.

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LOCOMOTIVE FIRE BOX.

No. 490,629. Patented Jan. 24, 1893.

Fig. 5.

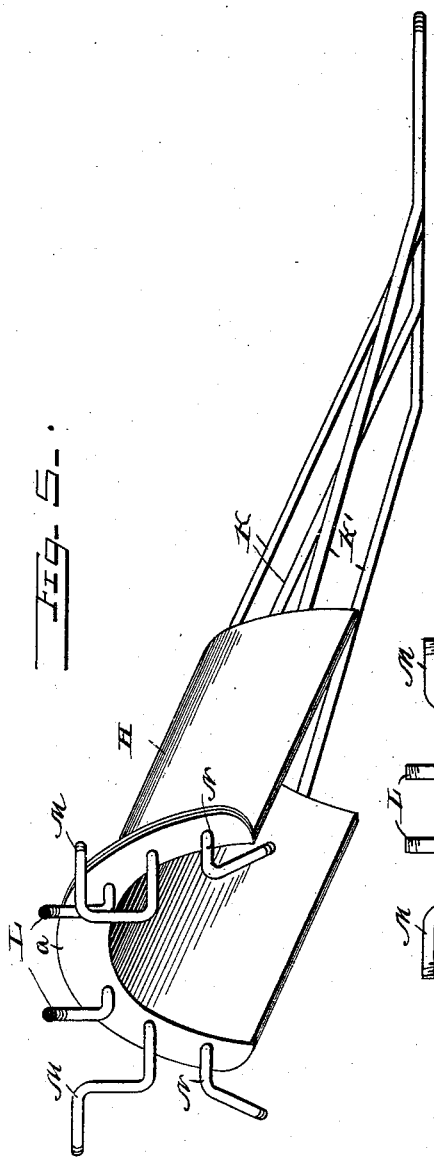
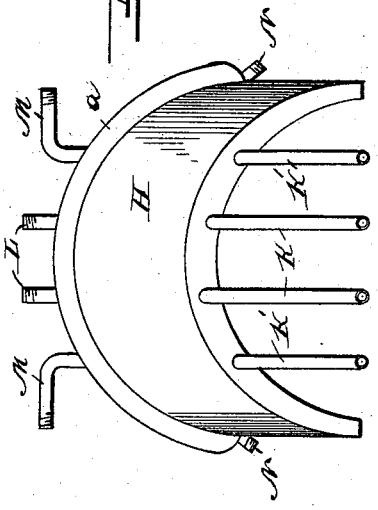


Fig. 6.



Witnesses:
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Phillemasi.

Inventor:
C. W. Hullings
by E. W. Anderson.
Attorney:

UNITED STATES PATENT OFFICE.

CHARLES W. HULLINGS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JESSE W. THATCHER, OF SAME PLACE.

LOCOMOTIVE FIRE-BOX.

SPECIFICATION forming part of Letters Patent No. 490,629, dated January 24, 1893.

Application filed April 30, 1892. Serial No. 431,252. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. HULLINGS, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Locomotive Fire-Boxes; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a side elevation of locomotive partly in section. Fig. 2 is a front view of fire box. Fig. 3 is a vertical longitudinal section of fire box and part of the boiler. Fig. 4 is a top plan view of fire box partly broken away. Fig. 5 is a perspective detail view of the baffler plate and Fig. 6 is a rear view of same.

This invention relates to certain new and useful improvements in locomotive fire boxes of the character described and claimed in my former patent No. 386,431, dated July 17, 1888, upon which this invention is designed as an improvement.

The invention more particularly relates to the construction and arrangement of the arched hollow baffler plate which extends from the top of the furnace opening in lieu of a door, inward and downward over the grate; and further in the manner in which the water chamber in said baffler plate is put in communication with the mud leg and water room of the boiler.

The objects of the invention are, first, to provide means for insuring a more perfect combustion of the fuel, whereby an important saving of the latter is effected; second, to provide for a more complete boiler circulation; and third, to do away with the deposit of sediment in the mud leg by the accomplishment of the first two objects, and also with the necessity for the spark arrester commonly employed in locomotives.

In the accompanying drawings, the letter A designates the furnace; B the furnace opening; C the boiler; D the grate; D′ the furnace deflector; E′ one of the two boiler feed pumps; F one of the two injectors, and G, G; the supply pipes leading from the water tanks of a locomotive, all of said parts being of the ordinary description.

H designates the improved, transversely arched baffler plate, of copper or other suitable material, and which is arranged to project inward and downward near the normal level of the fuel on the grate. This plate serves to deflect the air entering the opening B, upon the fire, which causes a more thorough combustion of the particles of carbon and gases of combustion which are ordinarily carried off unconsumed. By this means I am enabled to do away with the spark arrester required on the ordinary locomotive. In said baffler plate is a water chamber I, which is in communication with the boiler and with the mud leg J surrounding the fire box, in the manner presently described. On the outer end of the baffler plate is formed a single upward and laterally projecting flange *a*, which is arranged to rest against the outside of the furnace wall A′, around the upper portion of the opening B therein.

Communicating with the inner end of the chamber I is a series of lead pipes K, K, K′, K′, which at their forward ends are detachably connected to the pipes *b*, *b*, and *c*, *c*, at the rear end of the fire box. Said series of pipes are shown as being four in number, but I desire it understood that any suitable number may be employed. The two central pipes K, K, connect with the pipes *b*, *b*, while the outside pipes K′, K′, connect with the respective pipes *c*, *c*. Said pipes *b*, *b*, at their upper ends connect with the boiler at *d*, *d*, as shown, while the pipes *b*, *b*, lead into the mud leg J, at the points *e*, *e*.

L, L, are short pipes leading from the central upper portion of the outer end of the baffler plate and communicating with the chamber I therein. These pipes are designed to have detachable connection by means of suitable unions as shown, with short tubes L′, L′, which lead into the front portion of the boiler, or that portion nearer over the opening in the fire box.

M, M, are other short tubes leading from the central side portions of the outer end of the baffler plate, and detachably connected

by unions with pipes M′, M′, which connect with the injector and pump pipes, as indicated.

N, N, are short tubes leading from the lower side portions of the outer end of the baffler plate, and detachably connected with pipes O, O, which lead through the mud leg holes in the end wall of the furnace into the mud leg J. The pipes K, K, K′, K′, are connected to the pipes or tubes *b*, *b c*, *c*, by unions, the baffler plate being readily detached and replaced.

It will be apparent from the above, that there will be a continuous circulation through the mud leg, boiler, and baffler plate, owing to the lead pipes K, K, K′, K′, and their connections, and the connections L, L, L′, L′, N, N, and O, O. This prevents the baffler plate from being injured by the strong heat to which it is subjected, a difficulty experienced with the construction shown in my former patent, above referred to, and also keeps up a circulation of such character as to prevent the deposit of any sediment in the mud leg. The water chamber I therefore is not a mud leg in the ordinary meaning of the word, but has been so designated for convenience and in accordance with the common terminology.

A discharge pipe may be provided for the baffler plate, as in my former patent, or three-way cocks R may be provided in the pipes *b*, *b*, having a discharge into the ash pan.

The operation of filling the boiler and baffler plate may be the same as described in my former patent, or the boiler circulation may be depended upon to fill said baffler plate.

Cocks are provided in the various pipes and connections, as indicated in the drawings by means of which the circulation may be regulated, and the various pipes closed before detaching the baffler plate.

Having described this invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination with the locomotive boiler, and the fire box, having a fuel opening, of the baffler extending through the upper part of said fuel opening, said baffler having therein a water chamber and pipe connections between said water chamber and the boiler, and between said chamber and the mud leg, substantially as specified.

2. The combination with the boiler, and the fire box having a fuel opening, of the arched hollow baffler extending through the upper part of said opening, a series of lead pipes communicating with the inner portion of said baffler, and detachably connected at their forward ends with pipes communicating with the mud leg and with the boiler, and detachable pipe connections between the outer end portion of said baffler, and the boiler and mud leg, substantially as specified.

3. In a locomotive boiler, the combination with the fire box having the fuel opening therein, of the baffler extending through the upper part of said fuel opening, said baffler having therein a water chamber, and lead pipes communicating with the front and rear ends of said baffler, whereby a circulation is kept up therein, substantially as specified.

4. The combination with the boiler, and the fire box having a fuel opening, of the baffler extending through the upper part of said opening, said baffler having therein a water chamber, and lead pipes communicating with the front and rear ends of said chamber, whereby a circulation is kept up therein, and detachable unions for said pipes, together with shut cocks, whereby said baffler may be removed, substantially as specified.

5. In a locomotive boiler, the combination with the fire box, having the fuel opening therein, of the baffler extending through the upper part of said fuel opening, said baffler having a water chamber therein, and lead pipes to and from said chamber, whereby a circulation is maintained therethrough, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES W. HULLINGS.

Witnesses:

PHILIP C. MASI,

GEORGE H. PARMELEE.