

(No Model.)

G. W. RODGERS, Dec'd.

C. E. RODGERS, Administratrix.

CAR HEATER.

No. 519,644.

Patented May 8, 1894.

Fig. 1.

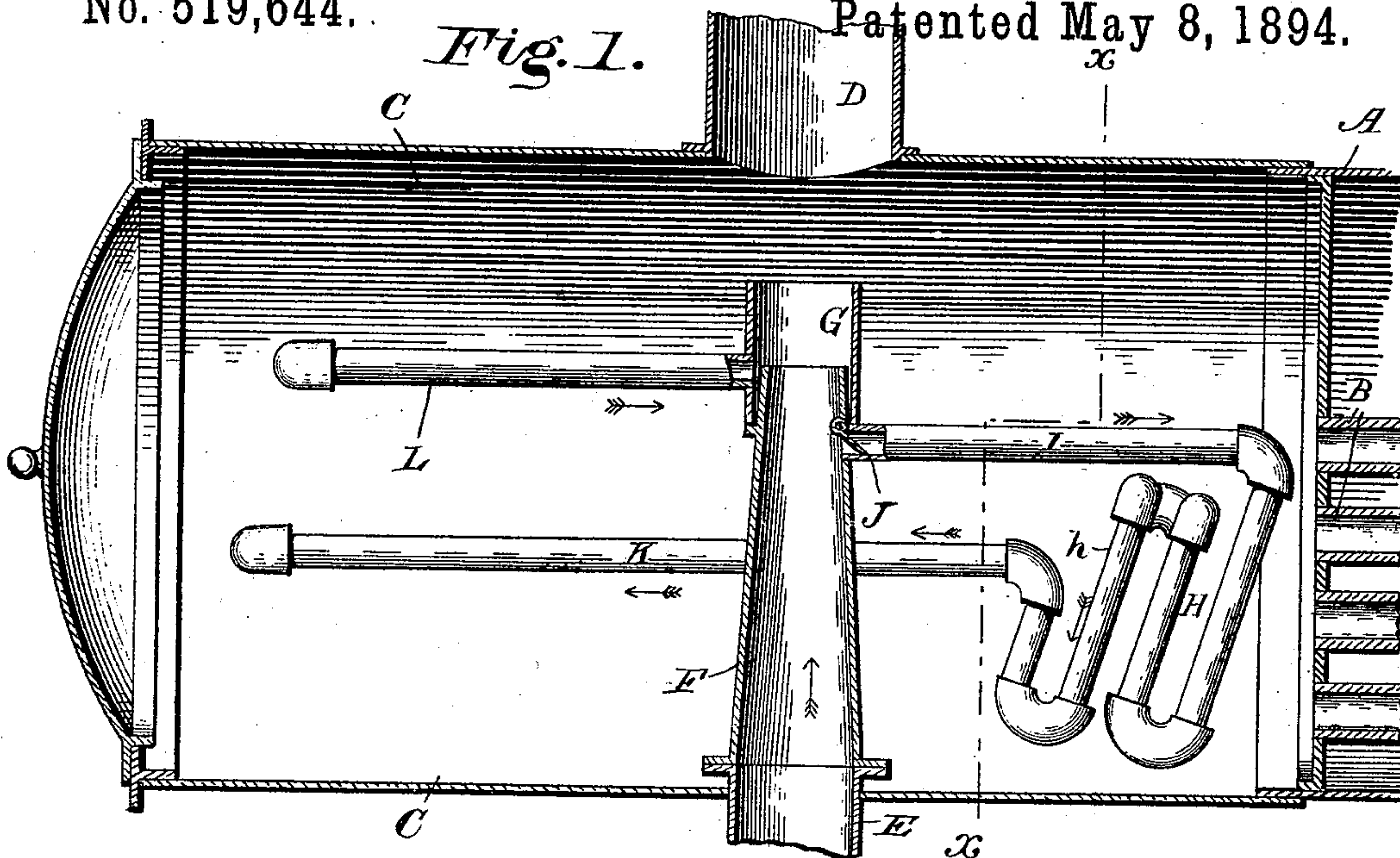
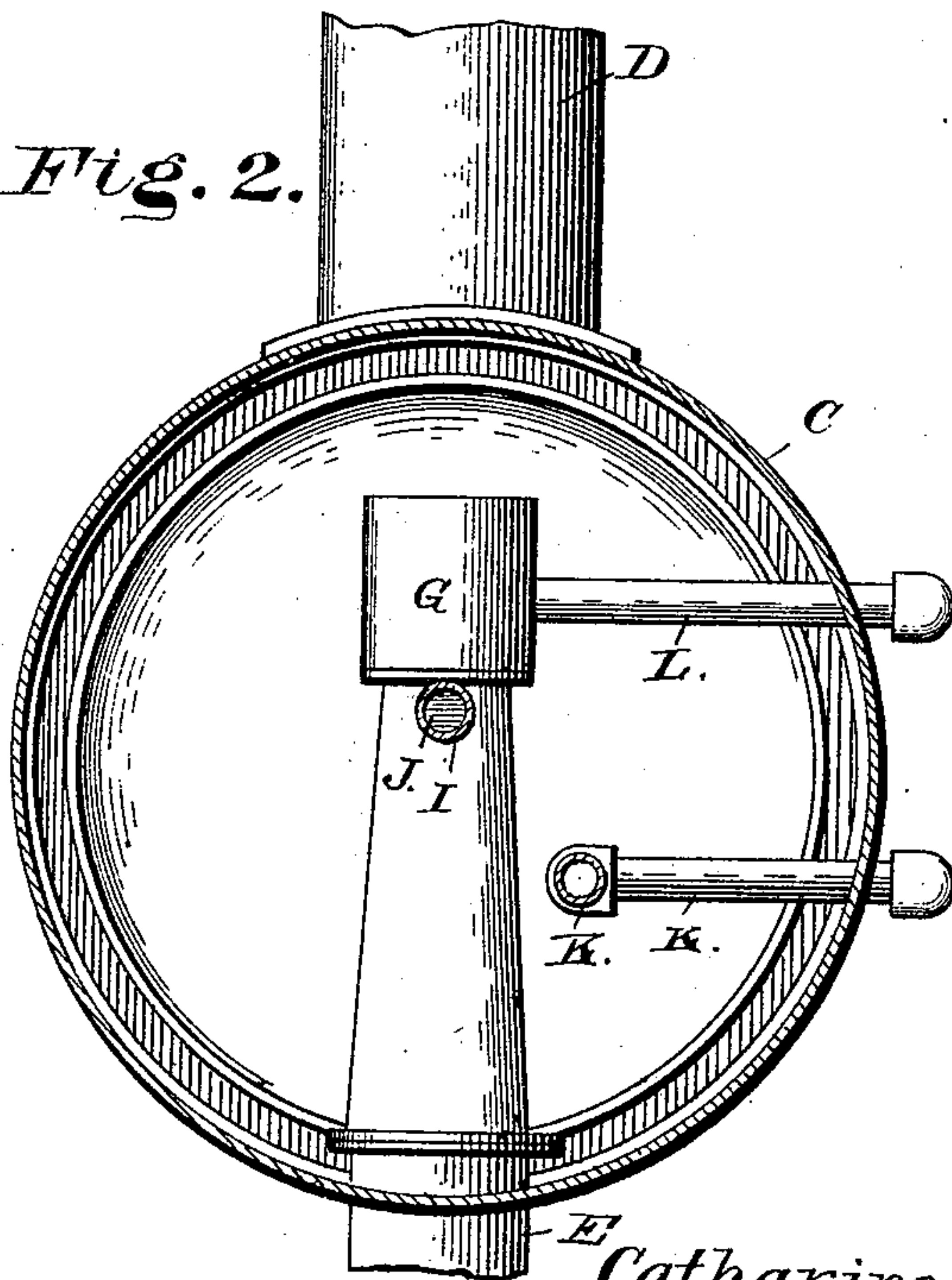


Fig. 2.



Catharine E. Rodgers,
Adm'r'x of the Estate of
Geo. W. Rodgers,

By her Attorneys, Deceased Inventor,

C. A. Snow & Co.

Witnesses

Julius M. Ke Jr.
L. P. Holman

UNITED STATES PATENT OFFICE.

CATHARINE E. RODGERS, OF BELLEFONTE, PENNSYLVANIA, ADMINISTRATRIX OF GEORGE W. RODGERS, DECEASED, ASSIGNOR OF TWO-THIRDS TO ISAAC THOMAS, OF SAME PLACE, AND A. S. VALENTINE, OF ATLANTIC CITY, NEW JERSEY.

CAR-HEATER.

SPECIFICATION forming part of Letters Patent No. 519,644, dated May 8, 1894.

Application filed July 26, 1893. Serial No. 481,540. (No model.)

To all whom it may concern:

Be it known that I, CATHARINE E. RODGERS, a citizen of the United States, residing at Bellefonte, in the county of Centre and State of Pennsylvania, and administratrix of the estate of GEORGE W. RODGERS, late a citizen of the United States, residing at Bellefonte, in the county of Centre and State of Pennsylvania, deceased, do hereby declare that GEORGE W. RODGERS invented a new and useful Improvement in Car-Heaters, of which the following is a specification.

This invention relates to car heaters; and it has for its object to provide certain improvements in car heaters of that type employed in connection with a locomotive boiler and arranged in the smoke box thereof.

To this end the main and primary object of the present invention is to provide an improved heating apparatus adapted to be arranged in the smoke box of a locomotive boiler, and capable of being employed in connection with the ordinary system of radiators in the coaches, or for heating the boiler feed water carried by the tender, and the apparatus depends for its usefulness and efficiency upon the exhaust steam from the engine, which exhaust steam is partially utilized to be circulated throughout the circulating pipes, as well as to create the necessary circulation through such pipes and is returned into the smoke stack of the locomotive, so that the draft of the fire is in no particular interfered with.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts, hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings:—Figure 1 is an enlarged central vertical sectional view of the smoke box end of a locomotive boiler showing the improved heating apparatus arranged therein in connection with the exhaust nozzle from the engine cylinders. Fig. 2 is a vertical sectional view on the line $x-x$ of Fig. 1.

Referring to the accompanying drawings, A

represents a locomotive steam boiler having the flues B, thereof, opening at one end into the front smoke box C, which smoke box is located at the forward end of the boiler, and has arising therefrom the usual smoke stack D. Entering the bottom of the smoke-box C, is the usual exhaust steam pipe E, which leads from the engine cylinders, and serves to conduct the exhaust into the smoke box of the boiler in order to assist the necessary draft in the ordinary manner, and attached to the inner end of the pipe E, and projecting upwardly within the smoke box in a line with the smoke stack D, is the exhaust cone F, the upper reduced discharge end of which is capped by the ejector nozzle G, of a slightly greater diameter than the same, in order to leave a suction space at the base of said nozzle.

Arranged at an inclination at one side of the exhaust cone F, directly in front of the flue ends B, is the gridiron or baffle coil heater H. The heater H, comprises a parallel series of vertical coils h , extending transversely across the smoke box C and disposed at an angle, in front of the flue ends in order to receive the full effect of the intense heat escaping out of the flues, so that such heat coming in contact with the heater H, will heat the same up to a very high degree. One of the end coils of the heater H, is extended into a supply pipe I, one end of which is attached to the exhaust cone F, near the upper reduced discharge end thereof, and at the connection of the pipe I, with the cone F, is arranged a drop trap valve J, opening inwardly within the pipe I and hinged or pivoted at its upper end thereof. Another end coil of the heater H, is connected with the steam circulating pipe K, which serves to carry the superheated steam to the point of use and circulate the same, and such steam after being used is brought back into the smoke box C, through the return pipe L, connected to the ejector nozzle G, at the base thereof. The said pipes L, or K, may be provided with suitably arranged valves in order to control the amount of circulation there-through,

Now it will be apparent that while steam is exhausted from the cone F, the heating apparatus herein described will be in full operation. The pressure of the exhaust steam will be sufficient to lift the drop trap valve, thereby allowing a portion of the exhaust steam to enter the gridiron or baffle coil heater H, in which the steam is superheated to a very high degree before it is circulated through the pipe K, to the point of use. The return pipe L is in the same circuit as the pipe K, and returns the utilized steam to the ejector nozzle G, from which it escapes. It will be obvious that the steam from the exhaust cone F, passes out of the reduced upper end of said cone with great velocity, and entering the ejector nozzle G, before passing into the smoke stack, a vacuum is necessarily produced at the base of said ejector nozzle and therefore in the pipe L, which will be sufficient to create the necessary circulation of the superheated exhaust steam, and to also permit of the easy opening of the valve J.

From the foregoing it will be apparent that many advantages will accrue from the employment of the herein-described heating apparatus, and that such apparatus may be slightly modified at the discretion of the manufacturer and still subserve the same important functions of heating either a system of radiators or the feed water for the boiler, and it will also be understood that changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention, for it will be obvious that several minor features may suggest themselves to increase the utility of the apparatus without affecting the general construction thereof, such for instance as the employment of any approved construction of drip trap which may be arranged at the lowest point of the coils of the coil heater H, whereby means shall be provided for relieving such coil of any water of condensation which may have become deposited therein

and which might possibly affect the free vacuum circulation.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a heating apparatus, the combination of a locomotive boiler smoke box and the exhaust steam pipe leading into the same; of a heater comprising parallel series of connected vertical coils arranged at an angle directly in front of the flue ends within said smoke box and having a feed or supply pipe connected to said exhaust pipe and a valve arranged in said feed pipe and adapted to be opened by the pressure of steam in the exhaust pipe, substantially as set forth.

2. In a steam car heater, the combination with a locomotive boiler smoke box and an exhaust steam cone leading into the box; of a gridiron or baffle coil heater arranged at an angle within the smoke box directly in front of the flue ends and comprising a transverse series of vertical coils, said heater having a feed or supply pipe connected to the exhaust cone near its upper end, and a main circulating pipe, an inwardly and upwardly opening drop valve located in the feed or supply pipe of the heater and hinged or pivoted at its upper end to the top of the feed pipe, at the connection thereof with the exhaust cone and adapted to be exposed to the direct lifting action of the exhausting steam, an ejector nozzle fitted over the upper end of the exhaust cone, and the return circulating pipe connected to the ejector nozzle at the base thereof, substantially as set forth.

In testimony that I claim the foregoing as the invention of GEORGE W. RODGERS I have hereto affixed my signature in the presence of two witnesses.

CATHARINE E. RODGERS,
Administratrix of the estate of George W. Rodgers.

Witnesses:

JOHN B. LINN,
W. H. MUSSER.