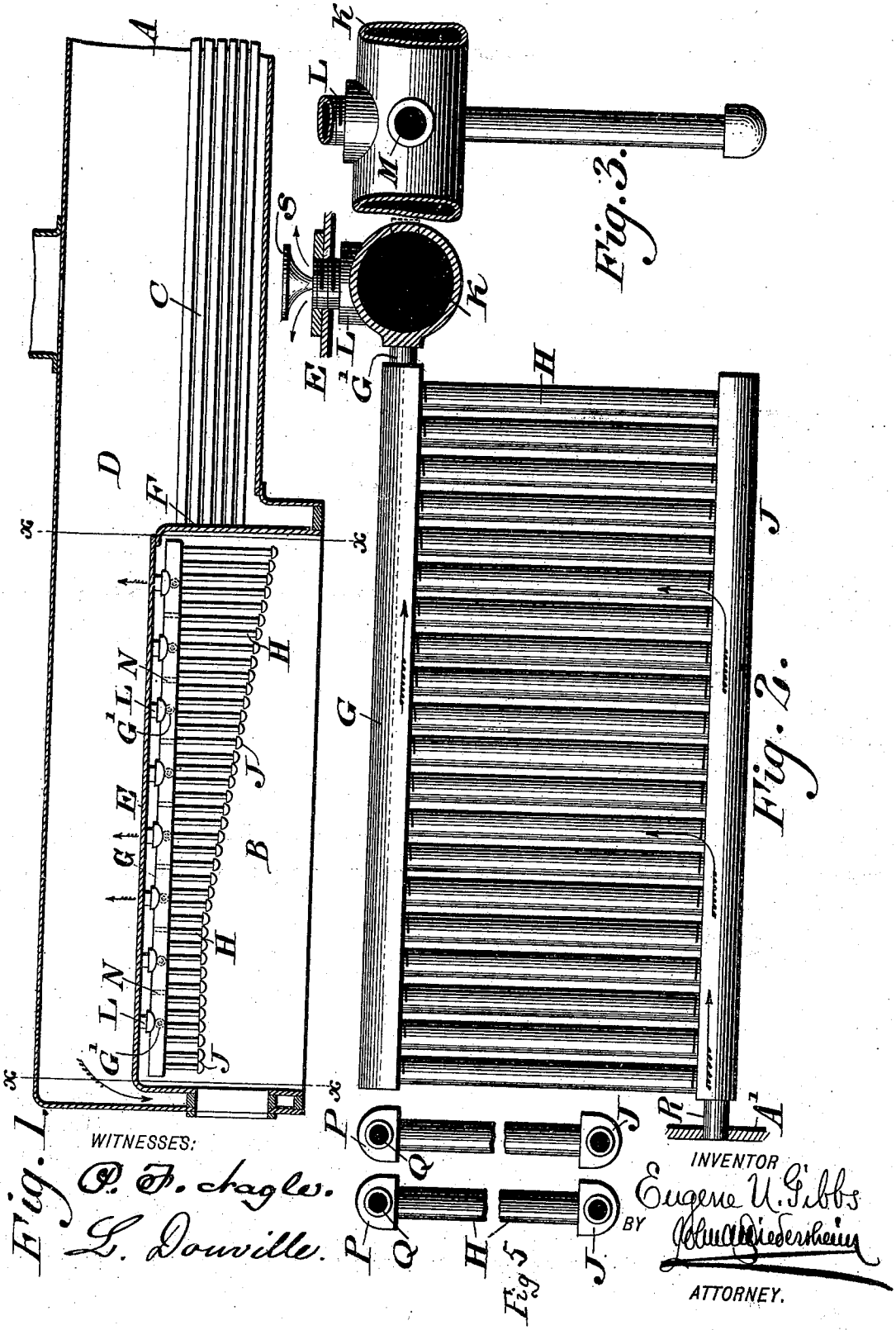
(No Model.)

2 Sheets—Sheet 1.

E. U. GIBBS.

BOILER FOR LOCOMOTIVE OR OTHER ENGINES.

No. 502,117. Patented July 25, 1893.



WITNESSES:

P. F. Eagles.

L. Douville.

INVENTOR

Eugene U. Gibbs

BY

ATTORNEY.

(No Model.)

2 Sheets—Sheet 2.

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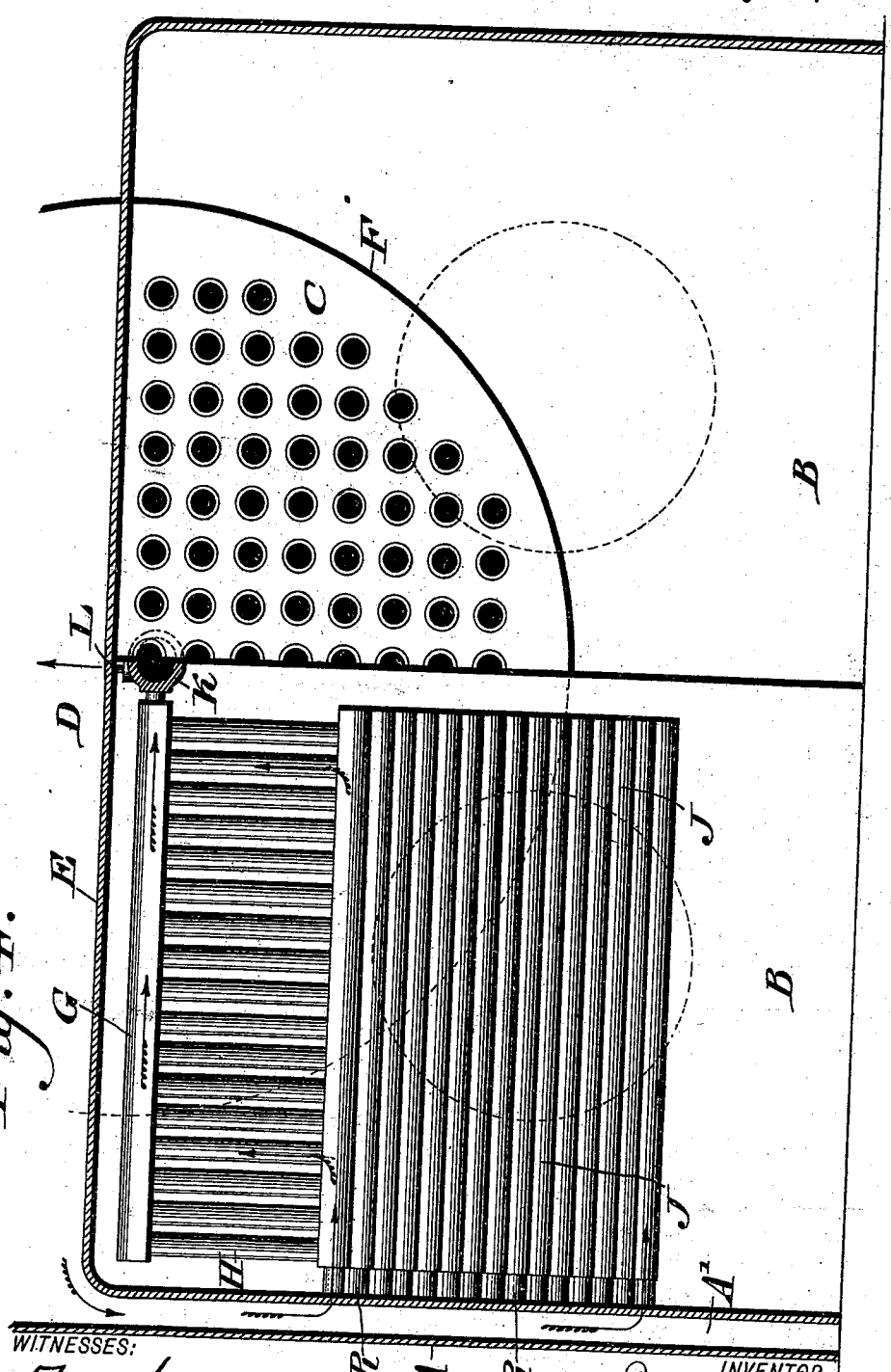

Fig. 4.

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UNITED STATES PATENT OFFICE.

EUGENE U. GIBBS, OF MOUNT HOLLY, NEW JERSEY.

BOILER FOR LOCOMOTIVE OR OTHER ENGINES.

SPECIFICATION forming part of Letters Patent No. 502,117, dated July 25, 1893.

Application filed October 6, 1892. Serial No. 447,996. (No model.)

To all whom it may concern:

Be it known that I, EUGENE U. GIBBS, a citizen of the United States, residing at Mount Holly, county of Burlington, and State of New Jersey, have invented a new and useful Improvement in Boilers for Locomotives or other Engines, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a boiler for a locomotive or other engine in which there are large heating surfaces and greater water-containing parts, the construction of the same being hereinafter fully set forth.

Figure 1 represents a longitudinal vertical section of a boiler embodying my invention. Fig. 2 represents a partial end view and a partial vertical section of a detached portion thereof on an enlarged scale. Fig. 3 represents a side elevation of the portion at a right angle to Fig. 2. Fig. 4 represents a transverse section on lines *x*, *x*, Fig. 1, on an enlarged scale. Fig. 5 represents a vertical section of a modification.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings:—A designates the boiler of a locomotive engine, B the fire box, C the flues for the products of combustion, and D the water and steam space.

E designates the crown sheet of the water space, and F designates the front sheet thereof, the flues C being connected with the latter sheet F.

In the upper part of the fire box is a horizontal shell G, from which depend the vertical tubes H, which extend in a number of rows across said box. The lower ends of said tubes H are connected with tubes J, which extend transversely and horizontally, and occupy the fire box. The tubes H increase in length in the direction toward the flues C, thus the providing increased surfaces exposed to fire, and greater water-holding capabilities.

The shell G is connected by nipples G′ with a tube K, in the upper part of the box B, and said tube is provided with vertical nipples L, which are connected with the sheet E, whereby the tube K is in communication with the space D, it being evident that the shell G and the tubes H and J are also in communication with said space. As said shell and tubes are subjected to the products of combustion, and the latter are permitted to circulate around said tubes and reach the shell G, the tube K and the sheets E, F, and enter the flues C, it is evident that an effective boiler is produced.

The shell G and tubes H, J, are shown in the present case in the left side of the box B, but they may be duplicated, the duplication occupying the right side thereof. For this purpose the tube K is provided with nipples M for connection with the sheet on the right side.

The shell G has vertical diaphragms or portions N therein, as shown in dotted lines Fig. 1, in order to separate said shell into numerous chambers which communicate with the tube K by means of the nipples G′.

In Fig. 5, the tubes H are connected with the tubes J, at bottom, as in the previous case, but in lieu of the shell G at the upper end, each row of tubes H is connected with tubes P at the top thereof, each of the same having a nipple Q for connection with the pipe K.

The lower tubes J communicate with the water leg A′, by means of nipples R, by which provision there is a circulation of water, as illustrated by the arrows.

Deflectors S are located above the nipples L, for preventing bubbling up and spouting of the steam and water into the space D.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A boiler having a water space above the fire box thereof, depending tubes arranged in series of increasing length, transverse tubes at the lower ends of and in communication with said depending tubes, and a separate tube connected with said depending tubes and in communication with said water box, said parts being combined substantially as described.

2. The vertical and horizontal pipes H and J, the tube K communicating with the pipes G and the water leg A′, said tube K communicating through the crown sheet E with the steam and water space D of the boiler, substantially as described.

3. A boiler having in the fire-box thereof a series of depending tubes communicating with the water space of the boiler, each of said tubes having a transverse tube at its

lower end, and said depending tubes increasing in length toward the flues of the boiler, said parts being combined substantially as described.

4. A steam boiler having the fire box and the water space D, the latter with combustion flues C therein, the shell G with the vertical tubes H, the transverse tubes J communicating with said tubes H, and the tube K connected with said shell G and said water space, said parts being combined substantially as described.

5. The vertical pipes H, and the horizontal pipes J, the shell G connecting the opposite ends thereof, in combination with the pipe K, the water leg A′, and the nipples G′, R, substantially as described.

6. A boiler having in its fire-box a shell formed with separate chambers, vertical tubes connected with the chambers of said shell and horizontal tubes connected with said vertical tubes, said parts being combined substantially as described.

EUGENE U. GIBBS.

Witnesses:
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R. H. GRAESER.