S. M. VAUCLAIN.

SUPERHEATER.

APPLICATION FILED DEC. 20, 1907.

Patented May 18, 1909.

922,366.

3 SHEETS—SHEET 1.

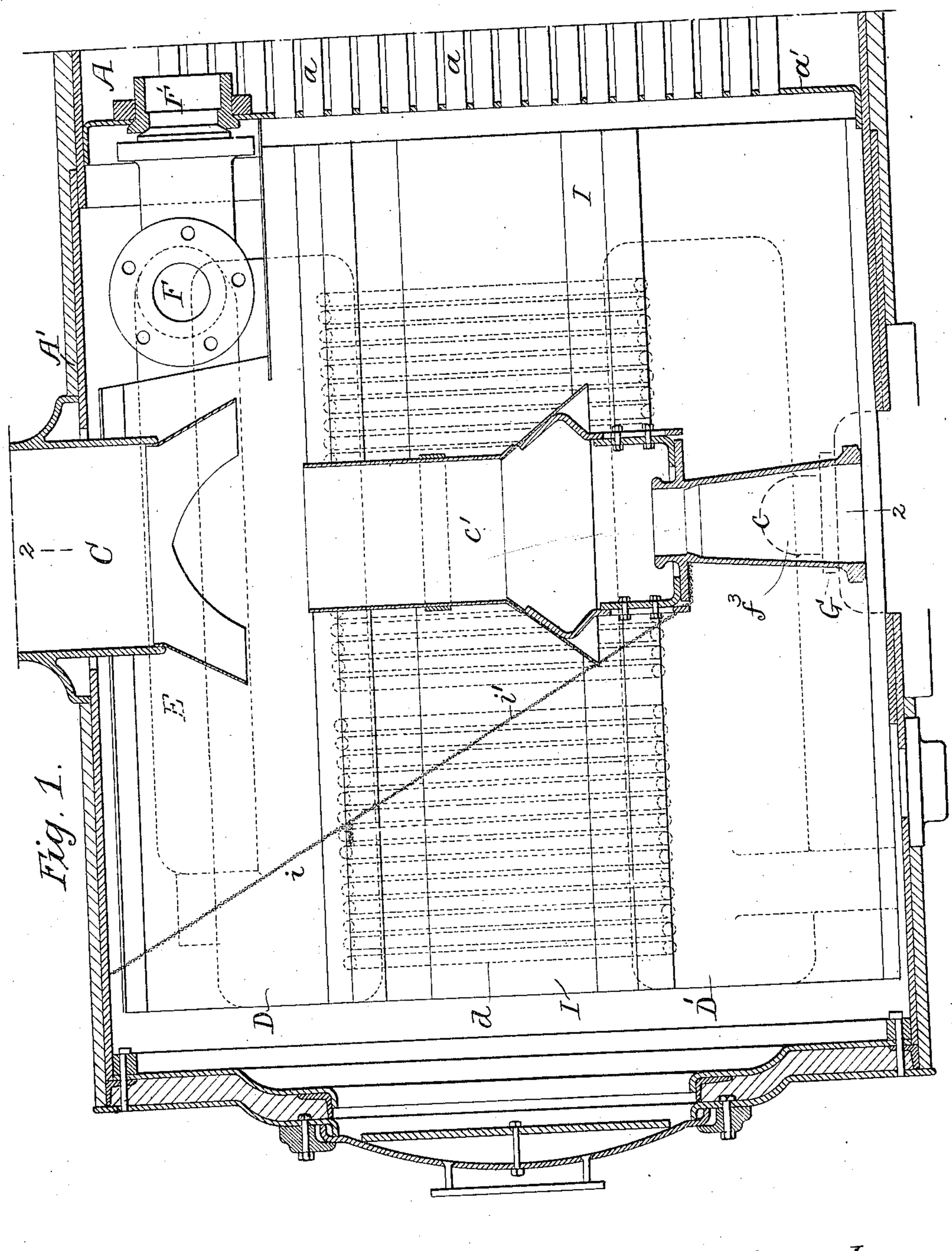


Fig. 1.

Witnesses:-
Walter J. Pellinger
Augustus B. Coffee

Inventor:-
Samuel M. Vauclain.
by his Attorneys,
Simon & Simon

S. M. VAUCLAIN.

SUPERHEATER.

APPLICATION FILED DEC. 20, 1907.

922,366.

Patented May 18, 1909.

3 SHEETS—SHEET 2.

Fig. 2.

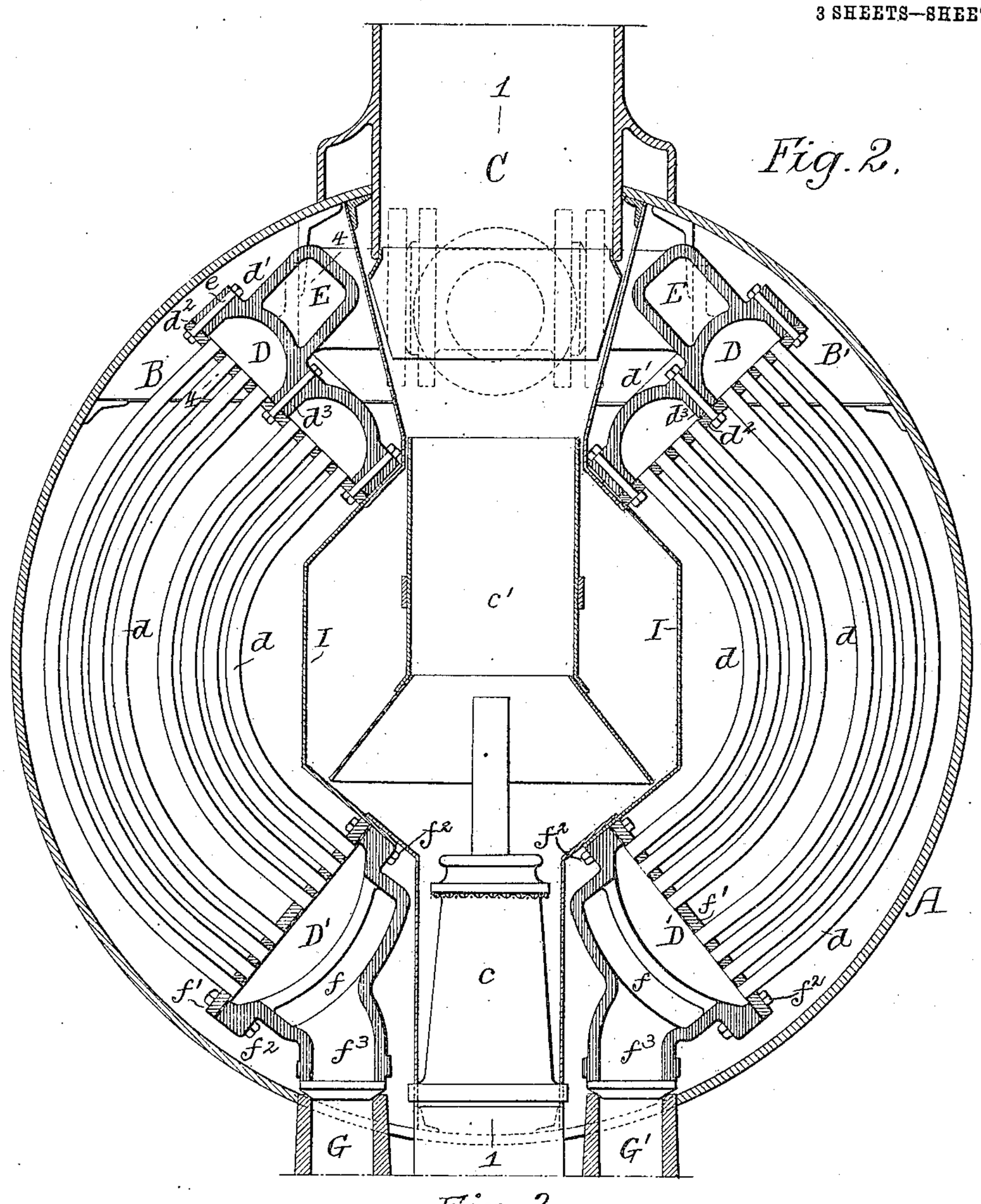
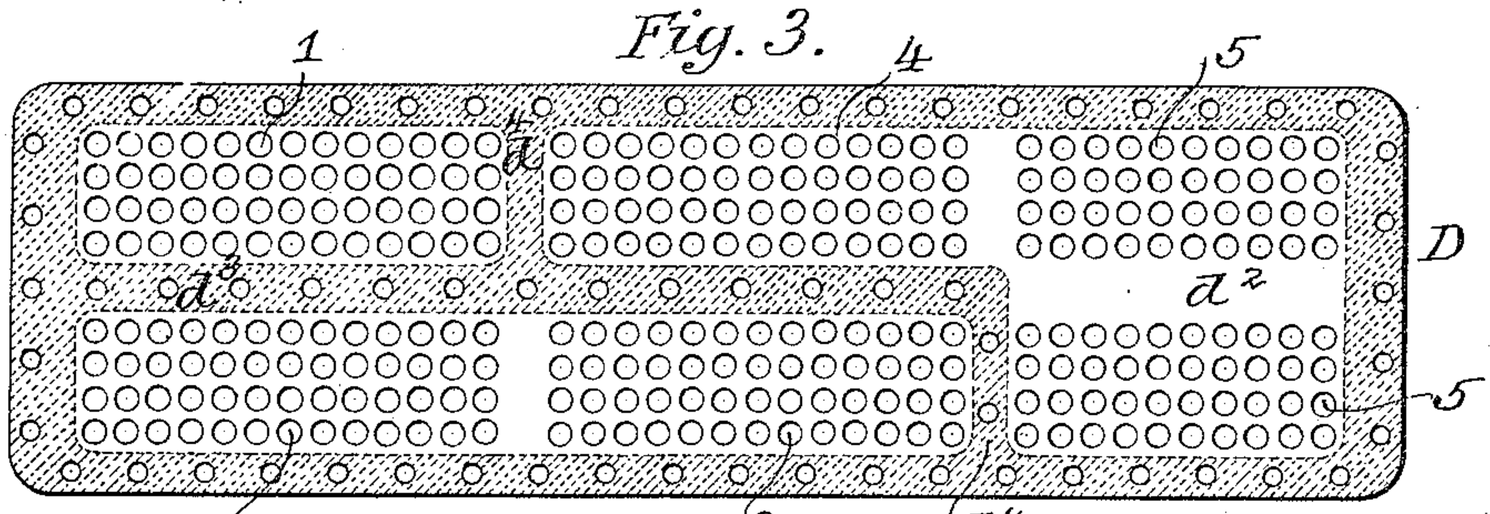


Fig. 3.



Witnesses:-
Walter H. Sullinger.
Augustus B. Coppes.

Inventor:
Samuel M. Vauclain
by his Attorneys,
Howson & Howson

S. M. VAUCLAIN.

SUPERHEATER.

APPLICATION FILED DEC. 20, 1907.

922,366.

Patented May 18, 1909.

3 SHEETS—SHEET 3.

Fig. 5.

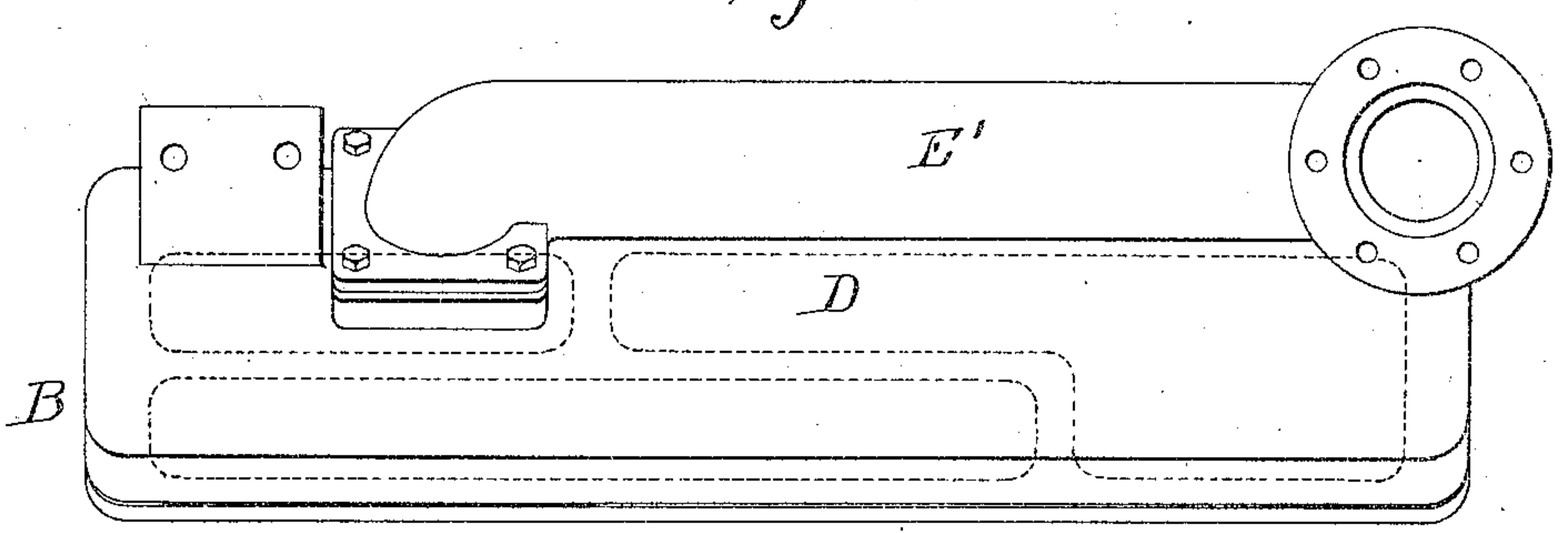


Fig. 6.

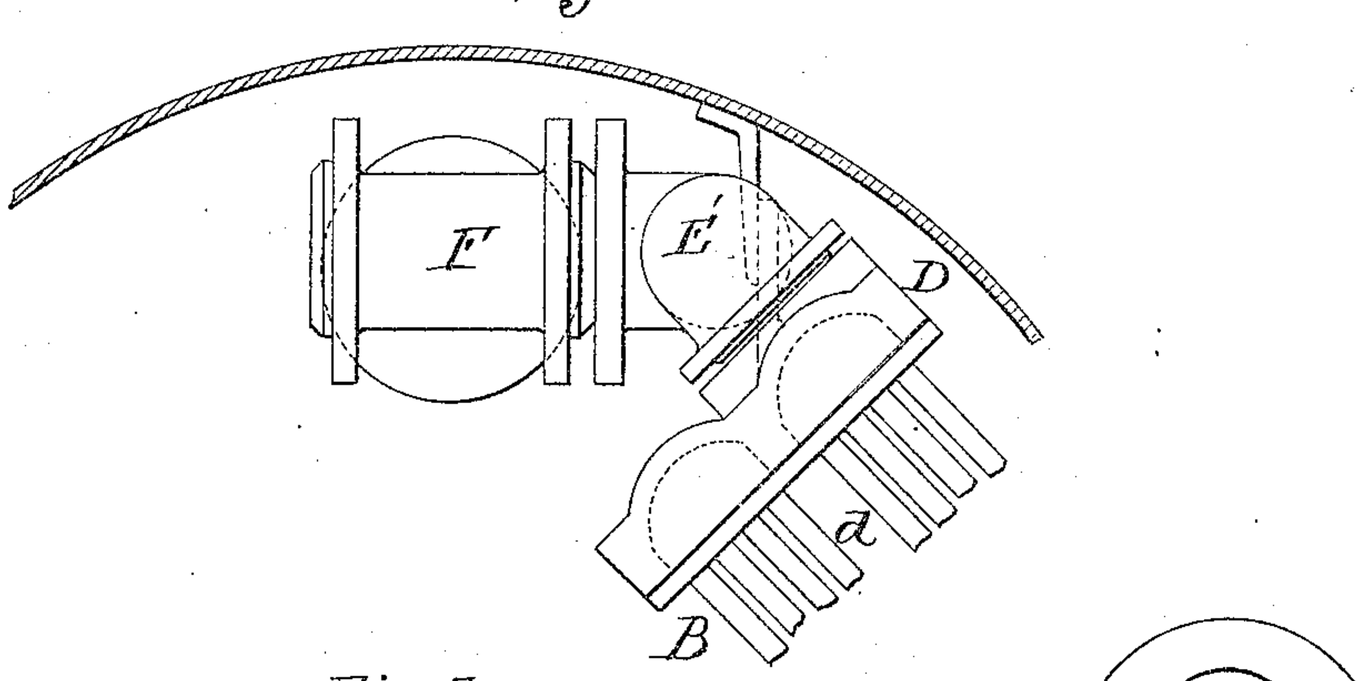
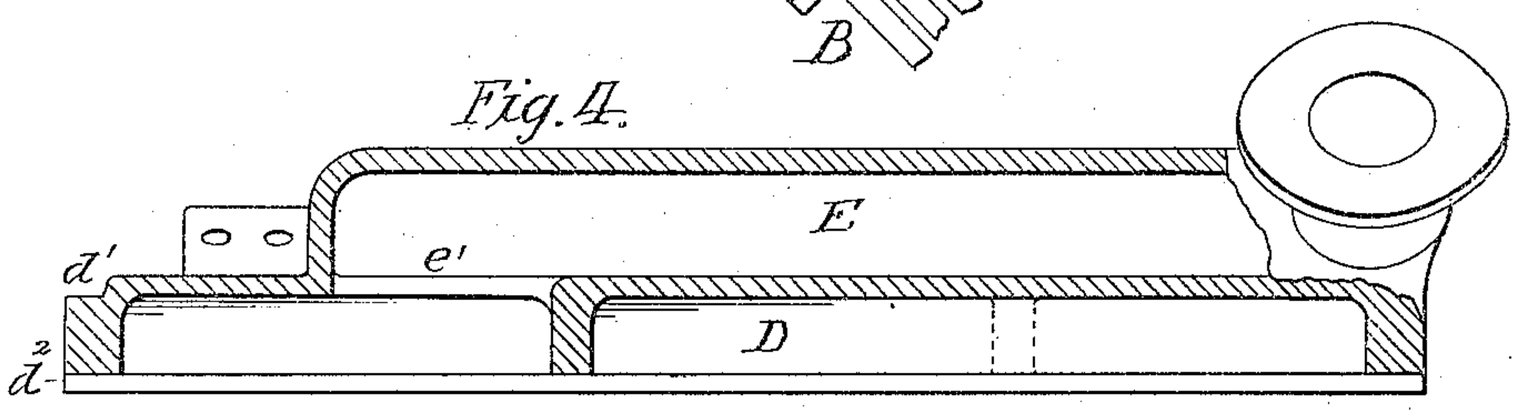


Fig. 4.



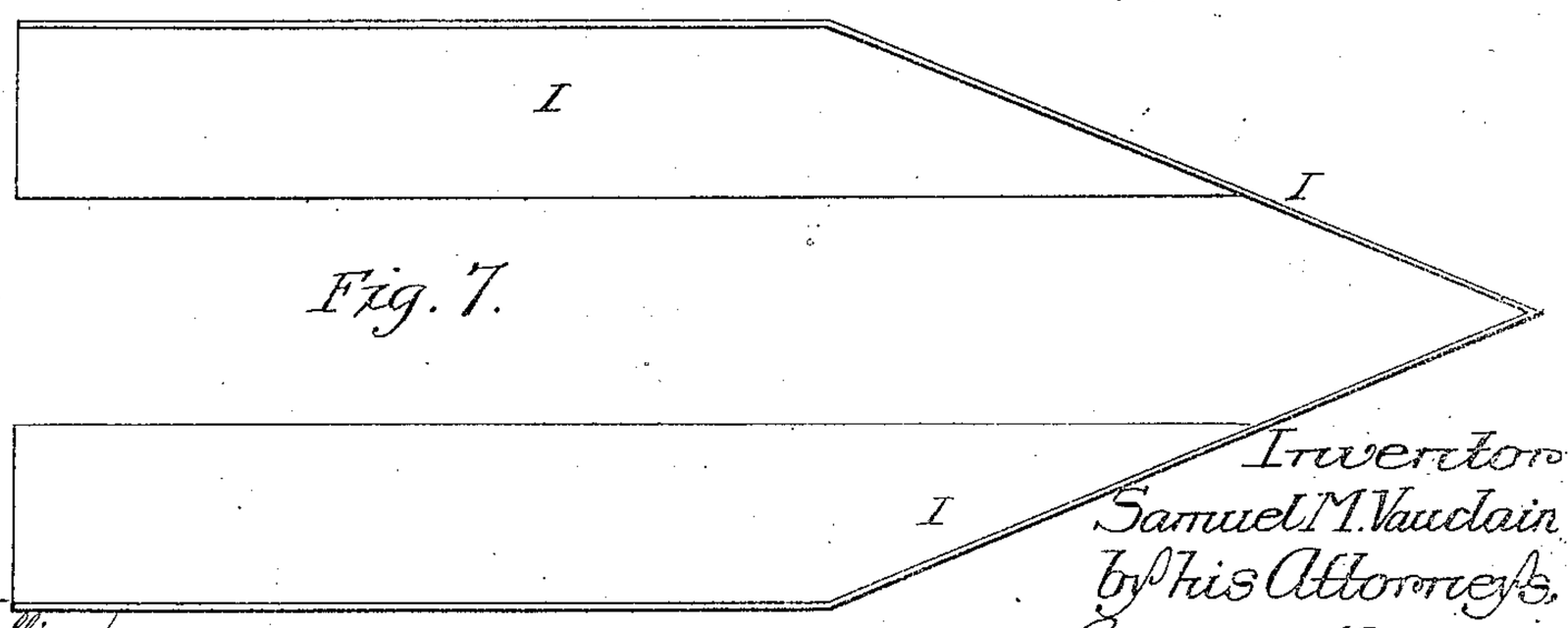


Fig. 7.

Witnesses:-
Walter F. Bullinger
Augustus B. Coppes

Inventor:
Samuel M. Vauclain
by his Attorneys.
Thomas Hobson

UNITED STATES PATENT OFFICE.

SAMUEL M. VAUCLAIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO BURNHAM, WILLIAMS & COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A FIRM.

SUPERHEATER.

No. 922,366. Specification of Letters Patent. Patented May 18, 1909.

Application filed December 20, 1907. Serial No. 407,316.

To all whom it may concern:

Be it known that I, SAMUEL M. VAUCLAIN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Superheaters, of which the following is a specification.

My invention relates to certain improvements in locomotive boilers in which the superheater is located in the smoke box, and which is connected to the boiler and to the cylinders of the locomotive.

The object of my invention is to so construct a superheater that the steam will enter the end of the superheater farthest from the boiler, and will be discharged from the superheater at a point near the boiler.

In the accompanying drawings: Figure 1, is a longitudinal sectional view on the line 1—1, Fig. 2; of my improved superheater; Fig. 2, is a transverse sectional view on the line 2—2, Fig. 1, the nozzle being in elevation; Fig. 3, is a plan view of the top plate of the superheater; Fig. 4, is a longitudinal section on the line 4—4, Fig. 2; Figs. 5 and 6, are views of modifications of my invention; and Fig. 7, is a view of the deflecting plate.

A is the locomotive boiler having tubes *a*, which are secured to a tube sheet *a'* in the ordinary manner.

A' is the smoke box casing inclosing the superheater made in two parts B, B', as shown clearly in Fig. 2. Within the smoke box is the nozzle *c*, the hood *c'*, and the stack C, of the usual construction.

The superheater in the present instance is made in two sections, as shown, each section having an upper header D, a lower header D', and connecting tubes *d*. These tubes are bent so as to conform to the shape of the shell of the superheater as near as possible. This construction enables me to place the superheaters in each side of the smoke box, leaving the central portion clear and unobstructed, so that access may be had to the interior of the smoke box.

The header D consists of a casting *d'* and the tube plate d^2. The casting *d'* in the present instance, has a longitudinal partition d^3, and two transverse partitions d^4, as shown by dotted lines in Fig. 3, which separate the header D into sections. The tube plate d^2 is connected to the casting *d'*, by bolts *e*. In some instances, the center line of bolts which pass through the partition d^3 may be dispensed with.

E is a tubular enlargement forming an integral part of the casting *d'*, and extends nearly the full length of the header D, as indicated in Figs. 1 and 4. This tubular extension connects with the forward end of the header through a passage *e'*, and is coupled at the opposite end to a T-union F which in turn is coupled to the tube F' leading to the steam space in the boiler.

The lower header D' consists in the present instance of a body portion *f*, a tube plate *f''* coupled to the casting by bolts f^2, and this header has a series of partitions dividing it into sections, and has a neck f^3 communicating with the steam supply passage G of the steam cylinder. The partitions are so arranged as shown in Figs. 1 and 3, that the circulation of the steam through each superheater section is from the boiler into the passage *e'* direct to the forward end of the header D, then down the tube 1, returning through the tubes 2, then down through tubes 3, returning through the tubes 4, passing down the tubes 5 to the outlet end of the superheater, which is connected through a neck f^3 to the passage G, leading to the cylinders.

It will be noticed that the construction of the superheater section B' is similar to the section B, and is coupled in the same manner to the union F, and to the passage in the cylinder casting G'.

I, I are two deflecting plates, one on each side of the center of the smoke box, and these deflecting plates are drawn together at the rear end, as shown in Fig. 7, to form deflectors, so that the products of combustion will be deflected and will pass between the tubes of the superheater sections. These plates I I, extend to a point near the forward end of the smoke box, and inclined screens *i*, *i*, are attached in such position as to prevent the escape of large cinders from the smoke box to the stack when the products of combustion pass around the end of the plates I I and travel toward the stack.

In Figs. 1 to 4, inclusive, I have shown the supply pipe E formed integral with the casting of the upper header D, but it will be understood that a pipe, as shown at E', Figs. 5 and 6, may be used if desired, a pipe E' being coupled to each side of the union F, and coupled to the forward end of the superheater, as shown.

I claim:

The combination of a superheater adapted

to be mounted in the smoke box of a locomotive boiler, consisting of upper and lower headers and connecting tubes, the upper header having a tube plate and a recessed casting having integral partitions, and having a tubular extension communicating at the forward end with one of the cavities formed by the partition, and at the other end adapted to be coupled to the steam supply pipe leading from the boiler, substantially as described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

SAMUEL M. VAUCLAIN.

Witnesses:
J. H. KERST,
E. J. ABBOTT.