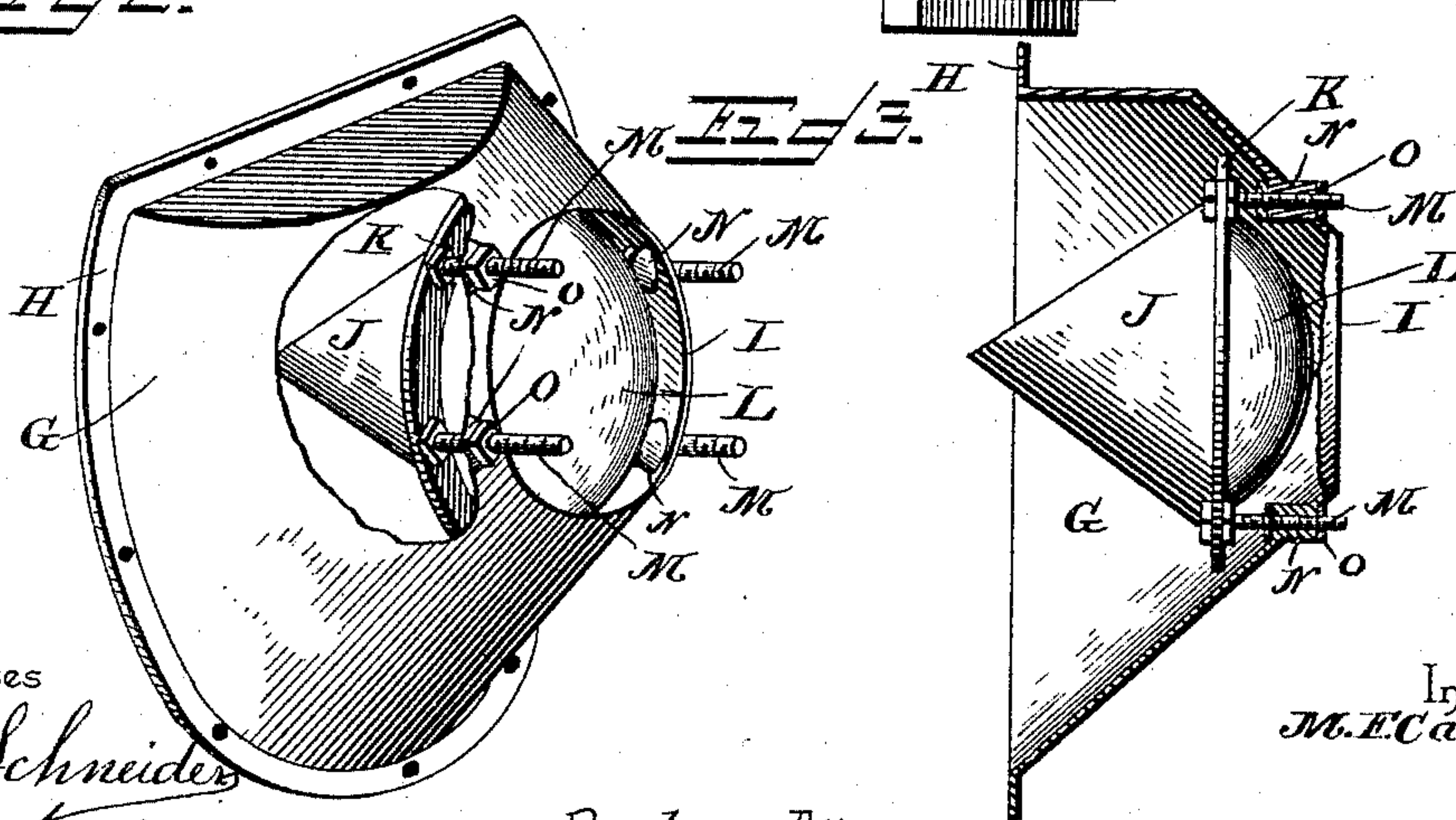
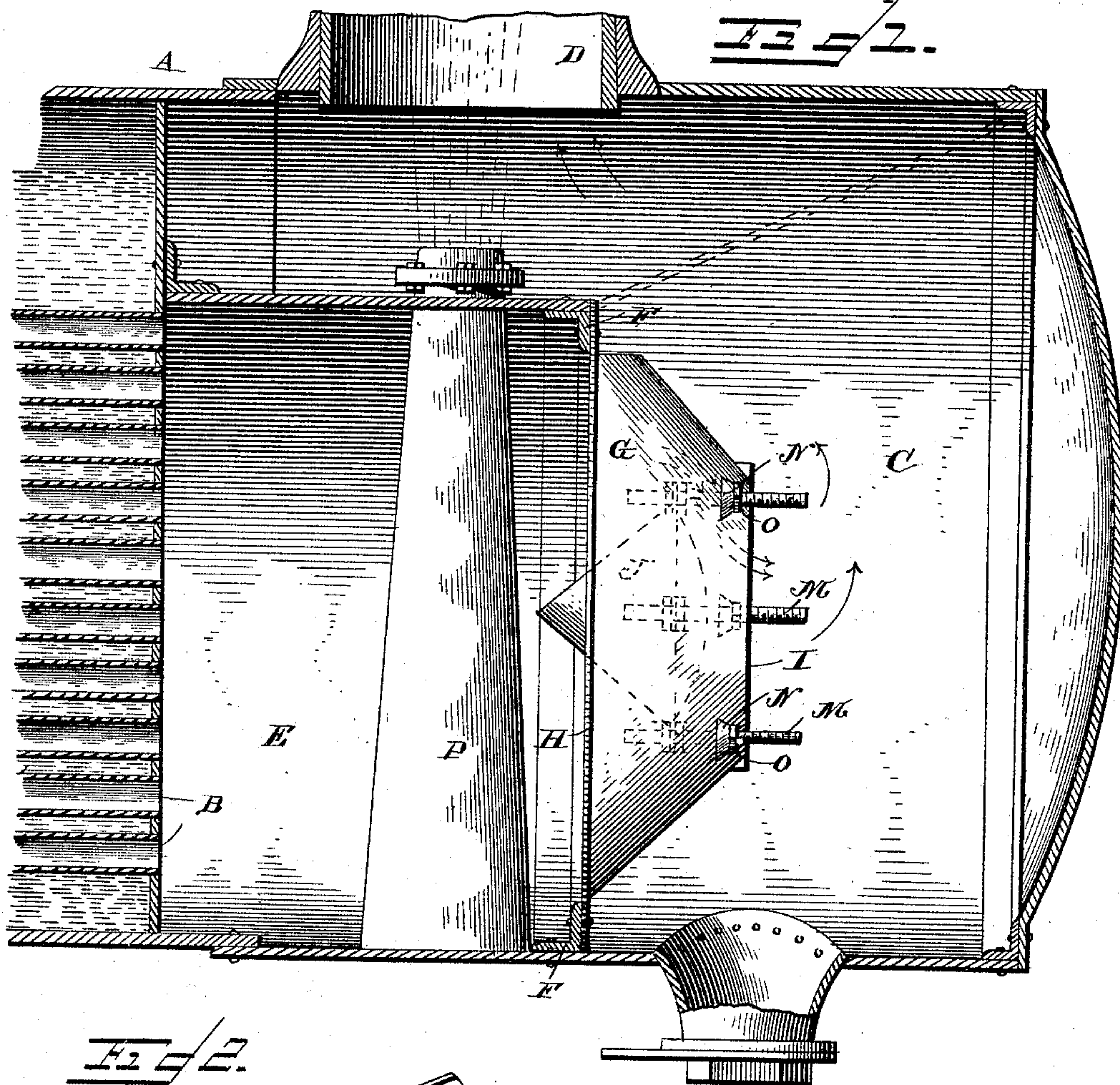


(No Model.)

M. F. CAMPBELL.  
DRAFT REGULATOR.

No. 495,473.

Patented Apr. 18, 1893.



Witnesses

W. Schneider

S. P. Volhaupt.

By *his* Attorneys,

Inventor  
*M. E. Campbell.*

Chas. Snow & Co.



# UNITED STATES PATENT OFFICE.

MATTHEW F. CAMPBELL, OF FORT MADISON, IOWA.

## DRAFT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 495,473, dated April 18, 1893.

Application filed December 27, 1892. Serial No. 456,388. (No model.)

*To all whom it may concern:*

Be it known that I, MATTHEW F. CAMPBELL, a citizen of the United States, residing at Fort Madison, in the county of Lee and State of Iowa, have invented a new and useful Draft-Regulator, of which the following is a specification.

This invention relates to draft regulators for steam boilers; and it has for its object to provide an improved draft regulator especially adapted for use in connection with locomotive boilers, in the smoke box of which the exhaust steam is usually discharged so as to facilitate the draft, and in connection therewith the invention primarily contemplates an improved draft regulator which shall provide means whereby a partial vacuum in the smoke box is insured, so that any desired amount of draft necessary for the particular boiler can be secured and regulated.

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 a vertical sectional view of the smoke box end of a locomotive steam boiler in which is arranged a draft regulator constructed in accordance with this invention. Fig. 2 is a detail in perspective of the funnel shaped cap and the regulating valve therein. Fig. 3 is a detail vertical sectional view of the construction disclosed in Fig. 2, at one side of the valve therein.

Referring to the accompanying drawings, A represents the front end of a locomotive steam boiler having the flues B, and the front smoke box C, from which leads the usual smoke stack D. Arranged over the front end of the flues B, and within the smoke box C, is the independent air-tight draft box E. The said draft box E, is suitably secured in position within the smoke box so as to receive all the products of combustion from the fire flues B, and has secured at the outer inner edge of the same the angle flange F, to which is securely bolted, in an air-tight joint, the funnel-shaped cap G. The funnel-shaped cap G, is provided with an annular base flange H, meeting the flange F, of the box E, and serves

to inclose the outer or front end of the draft box, so that the smoke and other products of combustion have no escape into the smoke box of the boiler except through said draft box and the circular draft opening I formed in the apex of the funnel cap G.

Mounted within the funnel cap G, in a line with the draft opening I, is the inwardly pointing conical valve J. The inwardly pointing conical valve J, is provided with an annular base flange K, which is somewhat larger than the circular draft opening I, so that the smoke and other particles of combustion can find escape through the draft opening I, must follow the divergence of the cone J, from its apex around the edges of said base flange, and thence through said circular draft opening. The width of escape space for the smoke and other products of combustion around the base of the cone shaped valve is regulated by means of the adjustment of said valve so that the convexed closure base L, is projected into or out of the opening I, as may be necessary.

In order to provide for the proper adjustment of the valve, I employ a number of screw threaded adjustment bolts M. The screw threaded adjustment bolts M, pass through perforated bearing lugs N, formed in the shell of the funnel G, and also through perforations in the base flange K, of the valve. Binding nuts O, engage the bolts M, on both sides of the base flange K, and the lugs N, so as to hold the valve and the bolts firm in their adjusted positions.

The exhaust steam nozzle P, passes through the draft box E, and exhausts into the smoke stack D, directly above the same.

Now, it is thought, that the operation of the herein described draft regulator will be apparent. By reason of having an air tight draft box inclosing the front open ends of the fire flues so that there is only escape through a valved opening, the exhausting steam in the smoke box necessarily creates a strong vacuum between the funnel cap and the front end of the smoke box, so that there is a powerful suction through the fire flues, which provides means for forming a strong draft through the flues and the grates, and this draft is of course regulated by means of the cone valve herein described, it being seen that the only passage for the escape of smoke and other



products of combustion as well as air, is through the single ports or openings I.

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.

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

1. In a draft regulator, an air tight draft box adapted to be arranged within a locomotive boiler smoke-box over the open ends of the flues, and provided with a single draft opening at one side in line with the flues, and an inwardly pointing conical valve attached to the draft box and adapted to be horizontally adjusted into and out of the draft opening, substantially as set forth.

2. In a draft regulator, the combination with a locomotive boiler smoke box, and the exhaust nozzle therein; of an air tight draft box arranged within said box over the open ends of the fire flues, a cap inclosing one end of said box and provided with a circular draft opening and a series of perforated lugs, a

valve arranged inside of said cap and provided with an annular flange having perforations, adjusting bolts engaging the bearing lugs of the cap and the perforations of the valve flange, and binding nuts engaging the bolts on both sides of said lugs and said flange, substantially as set forth.

3. In a draft regulator, the combination with a locomotive boiler smoke box and an exhaust nozzle therein; of an air tight draft box arranged within said smoke box over the open ends of the fire flues, a funnel-shaped cap inclosing one end of said box and provided with a circular draft opening in its apex, an inwardly pointing conical valve arranged within said funnel shaped cap and provided with a convexed closure base, and adjusting devices, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

MATTHEW F. CAMPBELL.

Witnesses:

GEO. P. NEAL,  
JOHN RIX.