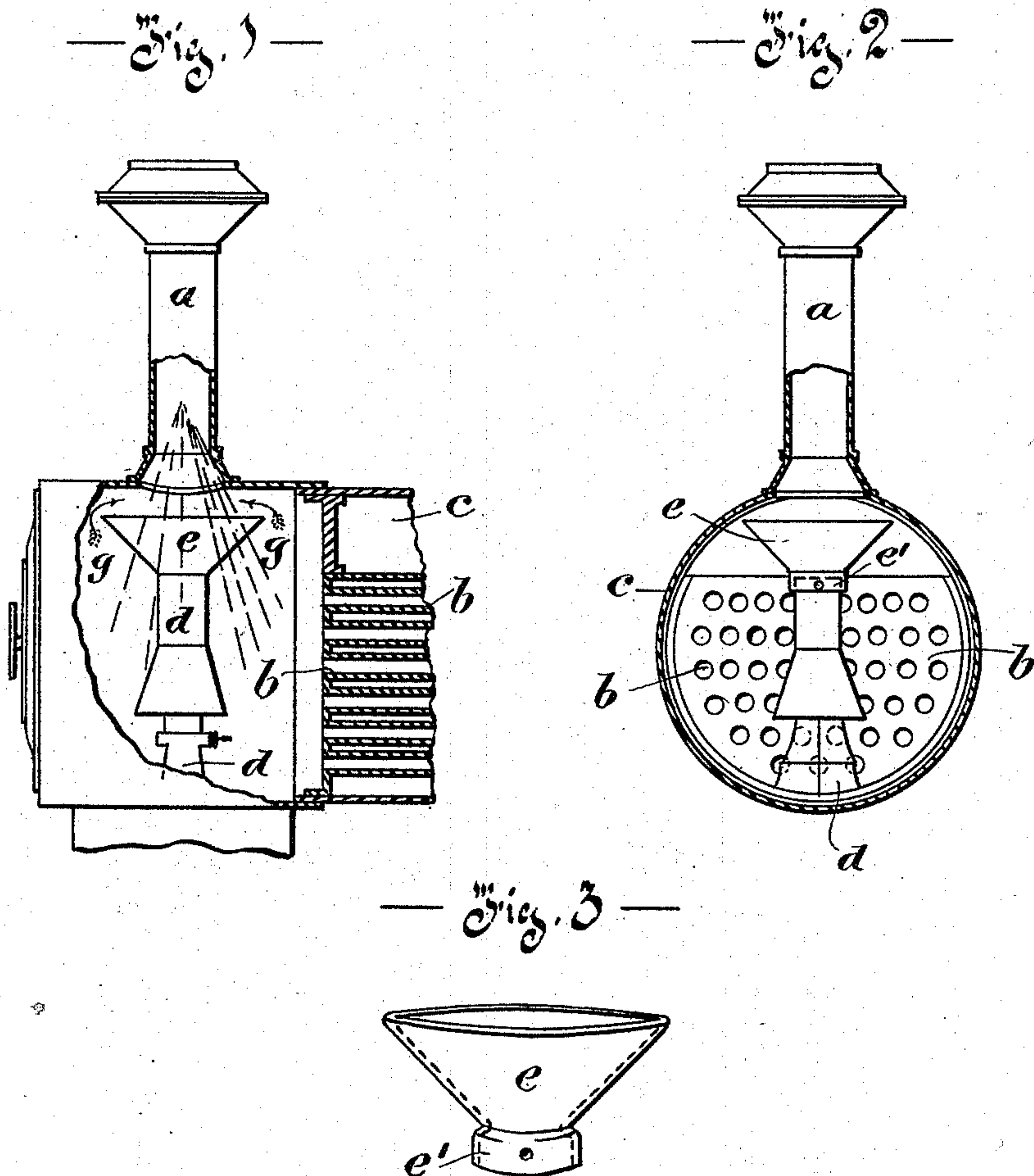


(No Model.)

C. A. COUCH.
LOCOMOTIVE.

No. 528,078.

Patented Oct. 23, 1894.



Witnesses
[Signature]
R. A. Stumber

Inventor
Charles A. Couch
By his Attorney
[Signature]

UNITED STATES PATENT OFFICE.

CHARLES ALBERT COUCH, OF COLUMBUS, OHIO, ASSIGNOR TO EVELINE N. TANNER, OF MONSON, MASSACHUSETTS.

LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 528,078, dated October 23, 1894.

Application filed January 15, 1894. Serial No. 496,961. (No model.)

To all whom it may concern:

Be it known that I, CHARLES ALBERT COUCH, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a new and useful Improvement in Locomotives, of which the following is a specification.

My invention relates to improvements in locomotives preferably in which the exhaust steam passes through the exhaust flue or pipe, upward through the smoke stack to aid the draft, and the objects of my improvement are: first, by interposing a heat deflector to the line of draft in the smoke stacks of a locomotive to deflect the heat before it passes upward through the smoke stack and cause it to circulate within the said smoke box, and tubes, rather than escape through the smoke stack; second, to prevent in a great measure the down draft of cold air into the smoke box and boiler tubes, and the disturbance of fire in the fire box, and consequent loss of fuel, and, third, to heat in its passage such air as succeeds in forcing itself downward toward the smoke box. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1. is a side view of the forward part of a locomotive boiler, with the smoke box and smoke stack partly broken away to show my deflector in position. Fig. 2. is a front view of the same, with the front of the smoke box removed and stack partly broken away; Fig. 3, a detailed view showing deflector.

Similar letters refer to similar parts throughout the several views.

c is the casing of the boiler, and *b*, boiler tubes; *a*, the smoke stack, and *d*, the exhaust flue, supported in place in the smoke box in line with the smoke stack in the usual way, as shown in Figs. 2 and 3.

Attached to the upper end of the exhaust flue or pipe, *d*, is the heat deflector, *e*, of shape shown, being that of an inverted, truncated cone, and made preferably of metal of sufficient thickness to retain considerable heat. The upper edge of the deflector is located on a line sufficiently below the lower opening of the smoke stack to leave a passage-way, *g g*, of the same or rather, greater capacity than that of the smoke stack. The

diameter of the upper edge of the deflector is greater than the lower opening of the smoke stack, in practice preferably about three inches, so that the downward draft of cold air is intercepted by the interior of the heat deflector.

The heat deflector, *e*, may be an integral part of the exhaust flue, *d*, as shown in Fig. 1, or it may be detachable, as shown in Figs. 2 and 3. In practice it has been ascertained that after each upward blast of the exhaust, a partial vacuum is formed in the smoke box, causing a downward rush of air through the smoke stack into the smoke box, and thence through the flues of the boiler, cooling the same and causing a disturbance of the bed of coals in the fire box, whereby much of the fuel is loosened, and the finer particles of the same escape before combustion takes place, through the flues of the boiler and smoke box and are thence lost through the smoke stack.

The mode of operation of my invention is as follows: After the heated air and gaseous products of combustion pass through the boiler tubes, *d*, into the smoke box, they impinge upon the outside curved surface of the heat deflector, *e*, and are deflected from their course toward the smoke stack and caused to circulate within the smoke box and around the said deflector, thereby heating it until they pass upward through the passage, *g g*, into the smoke stack, and thence to the open air. The cold draft of air downward through the smoke stack is prevented by striking the heated interior surface of the deflector, where it becomes heated, and if any escapes downward into the smoke box and boiler tubes, it is at a sufficiently high temperature not to chill the tubes. Furthermore, as the down draft is nearly abolished, the upward draft through the boiler tubes is nearly uniform so that the fire in the fire box is not disturbed, thereby preventing the escape of the smaller particles of fuel.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a locomotive, a hollow heat deflector located at the top of the exhaust flue, (*d*), having its sides inclined inwardly and downwardly, interposed and supported between

the boiler tube and the smoke stack, substantially as described.

2. In a locomotive in combination with the exhaust flue, *d*, the hollow, inverted conical
5 shaped heat deflector, *e*, located at the top of the said exhaust flue (*d*), interposed and supported between the boiler tubes, and the smoke stack, substantially as described and for the purposes set forth.

10 3. In a locomotive in combination with the exhaust flue, *d*, the hollow, inverted, conical

shaped heat deflector, *e*, located at the top of the said exhaust flue (*d*), and interposed and supported between the boiler tubes and the smokestack having its upper diameter greater 15 than the lower diameter of the smoke stack, substantially as described.

Montreal, November 27, 1893.

CHARLES ALBERT COUCH.

In presence of—

FRED. J. SEARS,

R. A. C. KIMBLE.