A. F. PRIEST.

LOCOMOTIVE SMOKE STACK.

APPLICATION FILED MAY 12, 1910.

995,092.

Patented June 13, 1911.

Fig. 1.

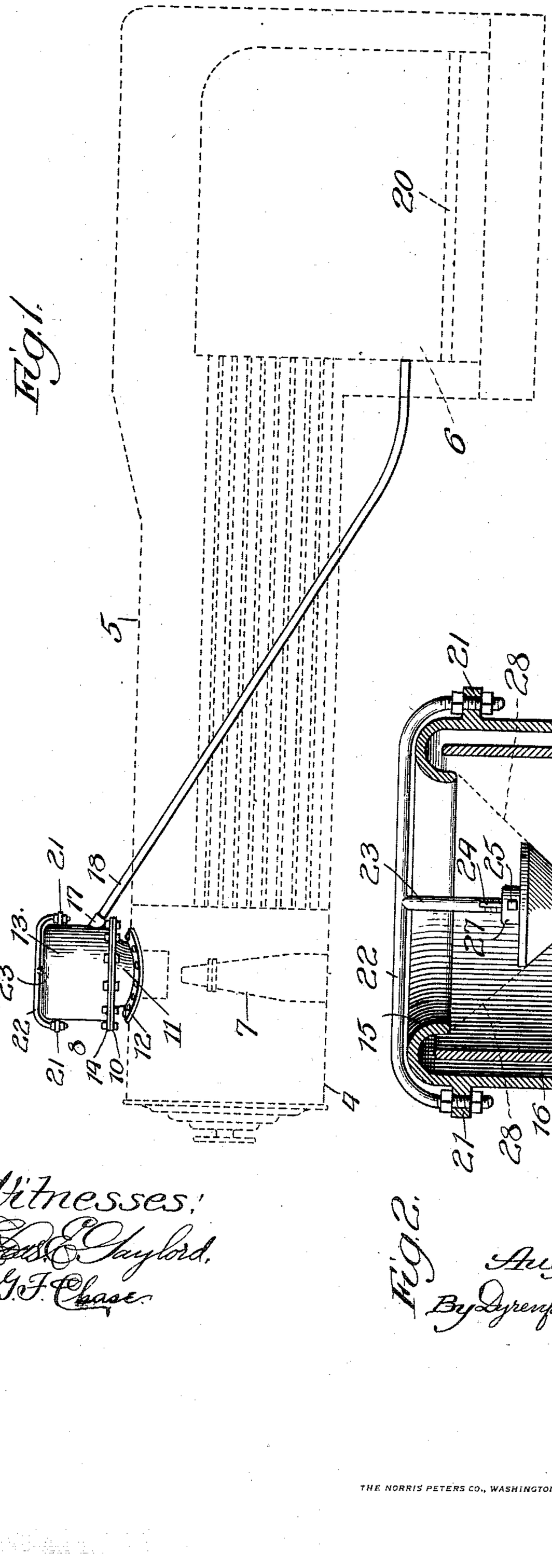



Fig. 3.

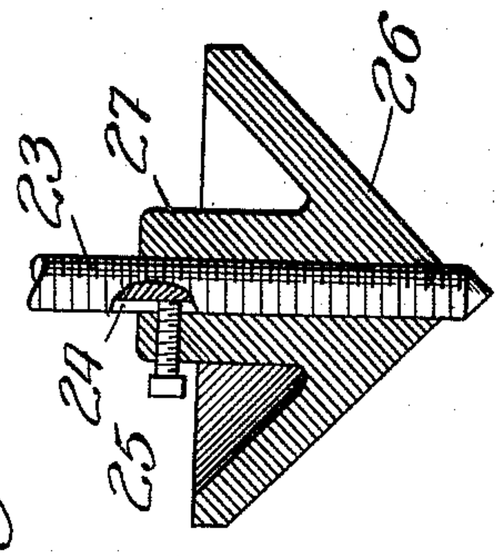
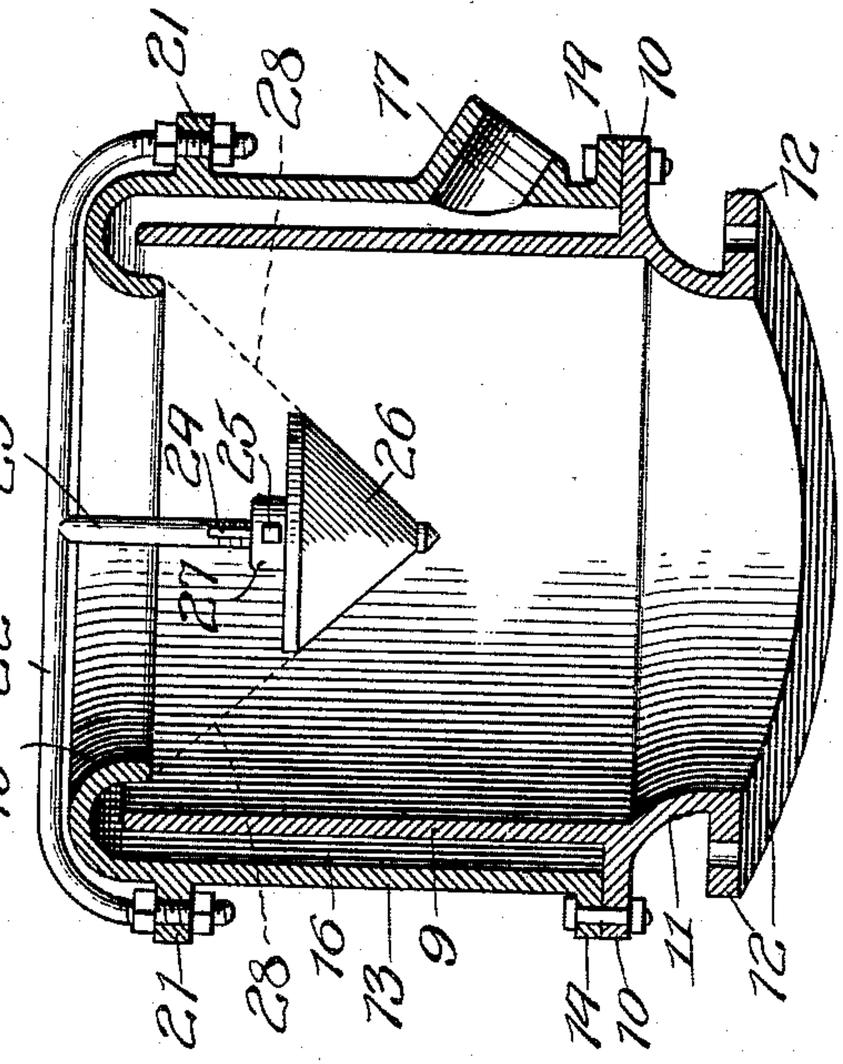



Fig. 2.




Witnesses:

Chas. E. Gaylord.

G. F. Chase.

Inventor:

Augustus F. Priest,

By Dyrenforth, Lee, Chritton & Wiles,

Attys.

# UNITED STATES PATENT OFFICE.

AUGUSTUS F. PRIEST, OF CHICAGO, ILLINOIS.

## LOCOMOTIVE SMOKE-STACK.

995,092. Specification of Letters Patent. Patented June 13, 1911.

Application filed May 12, 1910. Serial No. 560,809.

*To all whom it may concern:*

Be it known that I, AUGUSTUS F. PRIEST, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Locomotive Smoke-Stacks, of which the following is a specification.

The object of my invention is to provide a locomotive smoke-stack with an equipment of novel and peculiarly effective construction for intercepting and thus preventing the emission of cinders from the stack.

In the accompanying drawing, Figure 1 is a view in side elevation of the boiler and fire-box of a locomotive engine in dotted representation, with my improved stack, in full-line representation, in position on the smoke-box; Fig. 2 is an enlarged vertical section of the stack, and Fig. 3 is a section on a vertical line passing through the apex of the cone 26.

In the smoke-box 4 at the forward end of the boiler 5, which extends from the fire-box 6, is contained, as usual, an exhaust-steam jet, indicated at 7, in position to discharge centrally into the base of the stack 8. The stack comprises an inner cylinder 9 provided with a circumferential base-flange 10 and a neck 11 below the flange terminating in a circumferential seating-flange 12, at which it seats and is riveted on the smoke-box; and an outer cylinder 13, of greater diameter than the inner cylinder, with a base-flange 14 extending about it and bolted to the flange 10 to form a tight joint therewith, the upper end of the cylinder 13 being turned inwardly to form a cinder intercepting and deflecting hood 15 extending downwardly over the upper edge of the inner cylinder. The relatively narrow space between the two cylinders forms a cinder-chamber 16, which is provided near its base with an inclined outlet through the outer cylinder formed as an internally-threaded nipple 17 at which to attach a pipe 18 leading downwardly therefrom through the forward wall of the fire-chamber 6 into the latter above the grate therein, indicated at 20 in Fig. 1. At diametrically opposite points on the outer cylinder extend outwardly from it, near its upper end, perforated ears 21, in which are securely fastened by nuts, as shown, the threaded ends of a bar 22 of approximate T-shape, to extend the bar transversely across the center of the top of the stack with its stem 23 depending in the stack concentrically therewith. The stem is threaded and provided with a longitudinal groove at 24 to receive a set-screw 25 for adjustably fastening upon the stem a cone 26, which screws upon the stem and in the hub 27 of which the set-screw works. As indicated by dotted lines 28 in Fig. 2, the angle of the cone extends in a plane tangential to the edge of the hood; and, as will be observed, the area within the inner cylinder about the wider end of the cone is the same, at least approximately, as the area within the neck 11, at its inner end, whereby restriction of the passage through the stack by the provision of the cone is avoided.

By reason of the fact that the area of the opening in the overhanging or hood portion of the outer cylinder 13 is equal to that of the neck portion 11 of the inner cylinder 9, and that the space surrounding the base of the cone 26 suspended within the inner cylinder is approximately equal to the area of the lower open end of said cylinder, the flow of the gases through the stack is unimpeded and the speed of the current thereof undiminished. A further result of these features of construction is that the cinders are carried upward by the more rapid moving center or core of the gas current and are not thrown out from the action thereof until they impinge against the cone 26, by which they are deflected into the chamber 16. It will thus be seen that the greater mass of cinder is, as stated, carried by the more rapidly moving center of the gaseous body through the stack, and is not impelled against the wall of the cylinder 9, where the current of the gases is of less velocity, due to the friction of such current with said wall.

Cinders carried by the products of combustion from the boiler to the stack by the action of the steam-jet are forcibly impelled by the steam-pressure through the stack, wherein they are deflected by the cone, which may be suitably adjusted in its position, to enter the hood 15, which directs them into the chamber 16, whence they discharge under the pressure of the impelling-steam, through the outlet 17 and pipe 18 into the fire-chamber and are strewn over the fire-bed and consumed.

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

A locomotive smoke-stack comprising an inner cylinder and an outer cylinder form-

ing with the inner cylinder an interposed cinder-chamber, said outer cylinder being provided near its base with an outlet and having an inwardly-turned imperforate upper end forming a hood extending over the end of the inner cylinder and into the same beyond its upper end and spaced therefrom to form an overhanging inlet to said chamber, and a cinder-deflecting cone supported to extend wholly below said hood and so positioned as to cause the cinders in the stack to be deflected into said hood out of the path of the ascending gases, the opening through the inwardly turned upper end of the outer cylinder being equal in area to the reduced area of the opening in the lower end of the inner cylinder, and the space surrounding the base of the cone being approximately equal to the area of the lower end of said inner cylinder, whereby the flow of the gases through the stack is in a substantially straight path, and the velocity of such flow is unimpeded, as set forth.

AUGUSTUS F. PRIEST.

In presence of—
R. A. RAYMOND,
J. G. ANDERSON.