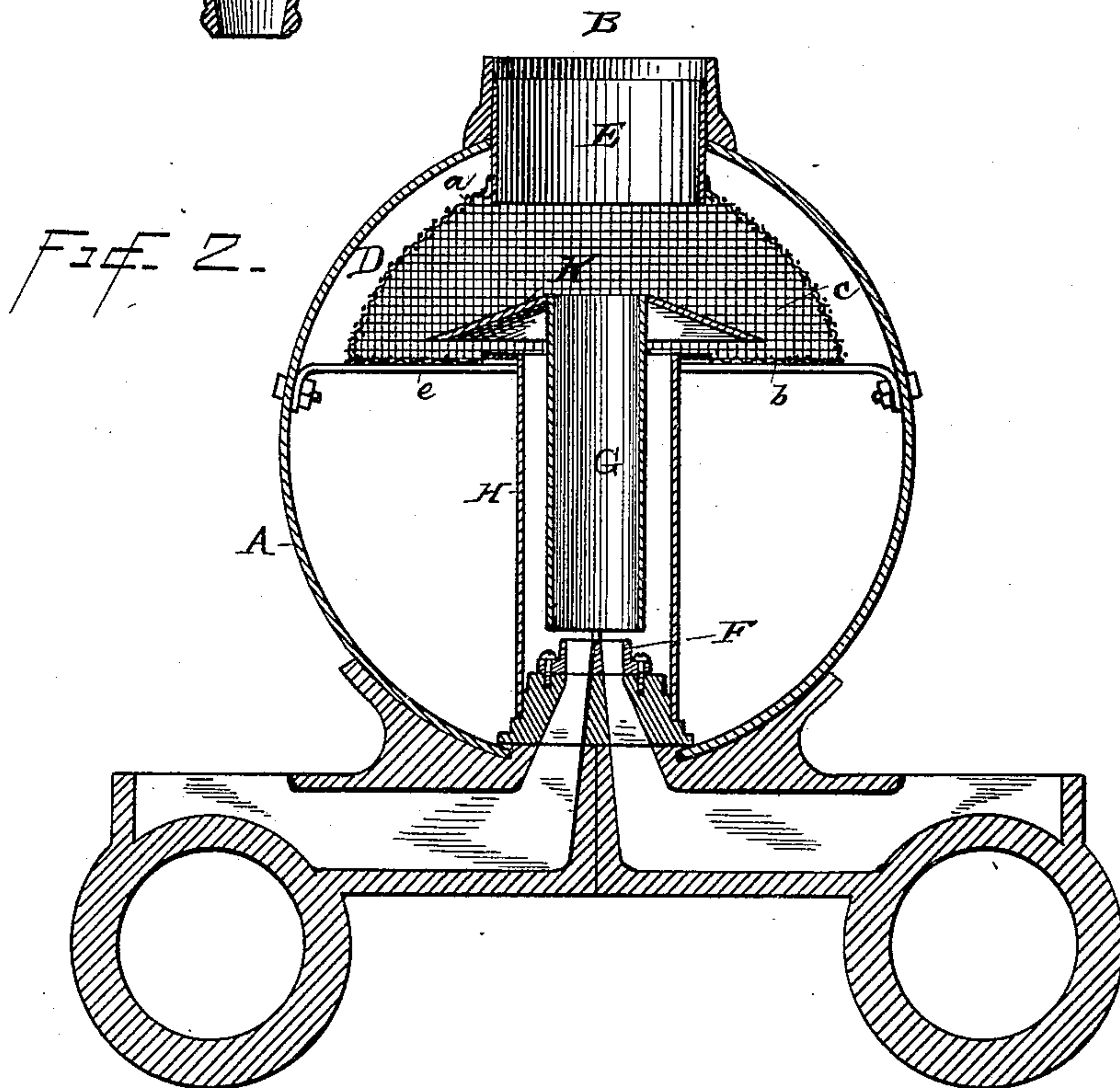
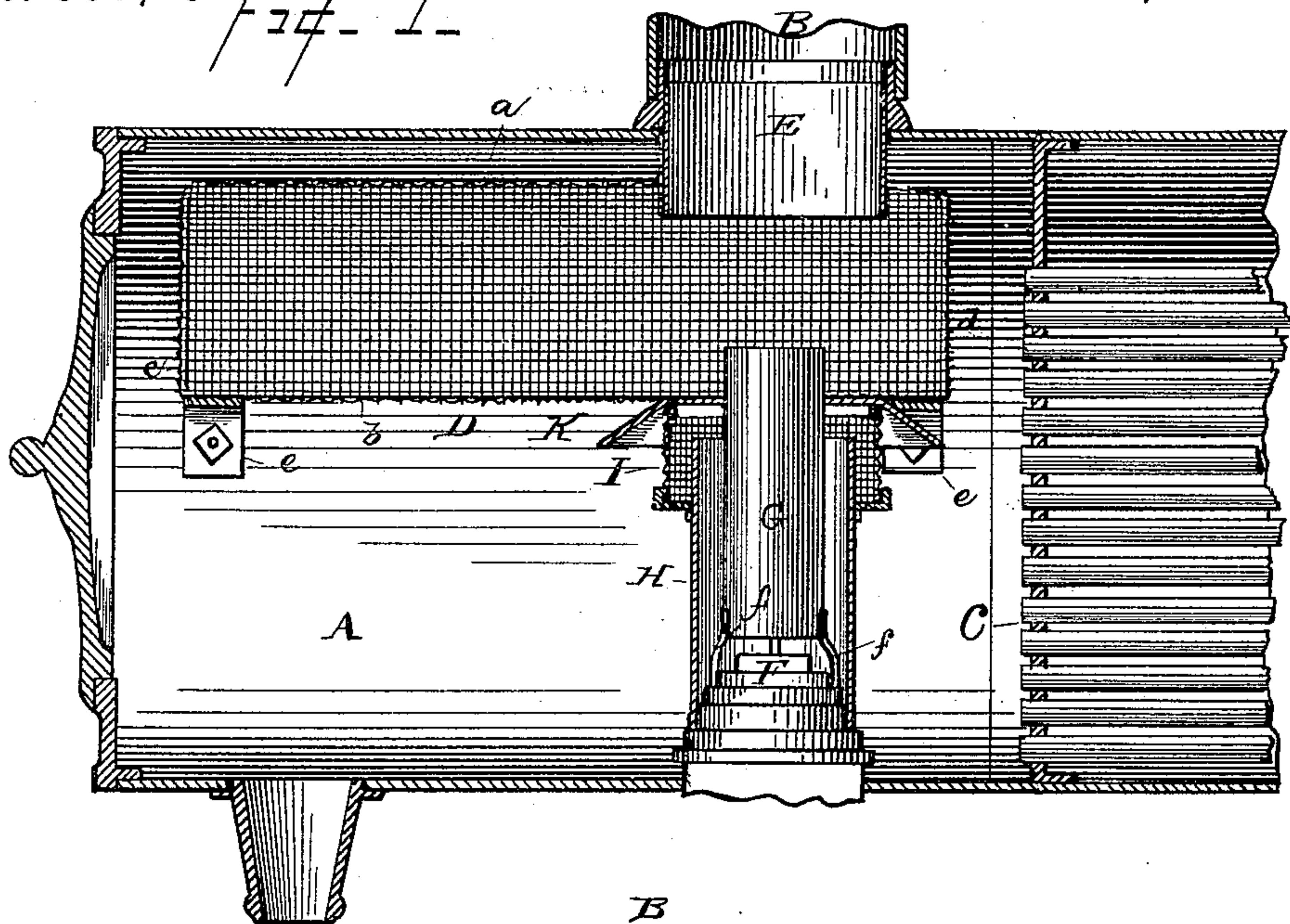


(No Model.)

G. B. TAYLOR.
SPARK ARRESTER.

No. 397,258

Patented Feb. 5, 1889.



ATTEST:
E. Rowland
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UNITED STATES PATENT OFFICE.

GEORGE B. TAYLOR, OF NEW BRUNSWICK, NEW JERSEY.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 397,258, dated February 5, 1889.

Application filed January 5, 1888. Serial No. 259,915. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. TAYLOR, of New Brunswick, in the county of Middlesex and State of New Jersey, have invented a certain new and useful Improvement in Spark-Arresters for Locomotives, of which the following is a specification.

My invention relates to that class of locomotives having the smoke-boxes at their front ends lengthened to form a receptacle for cinders, a space around the base of the stack within the smoke-box being inclosed by a screen extending lengthwise of the smoke-box and joined at its edges to the shell of the same. The exhaust-nozzle passes through this screen and terminates beneath the stack, so that the cinders are not forced up the stack by the exhaust. This construction of locomotives is effective as a spark-arrester; but it interferes to a considerable extent with the making of steam by the locomotive, necessitating a contracted exhaust-nozzle to give the proper draft, and hence producing a wasteful back-pressure. These objections, I have found, arise from two causes: first, the screen itself, and, second, the use of a long double exhaust-nozzle, heretofore found necessary. The screen interferes with the draft by retarding the admission of the products of combustion to the stack. This difficulty increases with use, since the openings in the screen become clogged, necessitating occasional cleaning. The long double exhaust-nozzle extending through the screen makes an imperfect steam-piston in the stack, since the exhaust is driven first up one side of the stack and then up the other side, and does not fill the stack as it should to give the maximum effect with a definite exhaust-pressure. This defect requires an increase of the exhaust-pressure, which is produced by contracting the size of the exhaust-nozzle, and results in wasteful back-pressure.

The defects arising from the use of the screen itself I have found I can overcome by increasing the surface of the screen. This I accomplish by constructing the screen as a complete inclosing-body located in the upper part of the long smoke-box and having greater horizontal than vertical dimensions, so as to produce extended top and bottom screen-sur-

faces. The lower portion of the smoke-box is left free for holding cinders, while the usual pipe in the bottom of the smoke-box is employed for discharging the cinders when the smoke-box is filled.

The defects arising from the use of the long double exhaust-nozzle I overcome by using a short nozzle, from which rises a directing-pipe common to both parts of the nozzle. To prevent the production of a vacuum in this directing-pipe, it is left open or provided with openings in its lower end at the nozzle. This directing-pipe is inclosed by another pipe which is closed at its bottom but open at its top, thus furnishing an air-passage to the open lower end of the directing-pipe from a point above the cinders in the bottom of the smoke-box. The directing-pipe passes through the screen, as may also the inclosing-pipe. If the latter terminates below the screen, its open upper end will be protected by a screen. In either case a hood may surround the directing-pipe above the inclosing-pipe to prevent any interference between the exhaust discharging from the directing-pipe and the draft entering the inclosing-pipe. This construction of the exhaust gives a discharge for the exhaust-steam centrally into the stack, which it fills, at once forming an effective steam-piston and enabling the maintenance of a proper draft with the minimum exhaust-pressure.

The invention consists in the way in which I increase the screen-surface, in the peculiar exhaust, and in the various novel combinations of parts, as hereinafter pointed out by the claims.

In the accompanying drawings, forming a part hereof, Figure 1 is a central longitudinal section through the smoke-box of a locomotive, the exhaust-nozzle and the directing-pipe being in elevation; and Fig. 2, a cross-section through the exhaust-nozzle, a modified arrangement of the inclosing-pipe being shown.

A is the shell of the smoke-box of a locomotive, B is the stack, and C is the tube-sheet. Heretofore the screen has been a flat one-sided screen, extending from the tube-sheet above the tubes to near the front of the smoke-box, the screen extending directly across the

smoke-box and being secured at its edges to the shell. I increase the surface of the screen D by making it with two or more sides. It has a top, *a*, as well as a bottom, *b*, and it also preferably has ends *c* *d*, all forming parts of the screen-surface. The preferred shape of my screen is that of a half-cylinder supported by cross-pieces *e*, secured to the shell of the smoke-box and leaving a space all around it, although it is evident that the screen may be of any suitable shape—such as a complete cylinder—or it may have the shape of a triangle or other flat-sided figure in cross-section. The screen thus forms a complete inclosing-body in itself. It is located in the upper portion of the smoke-box, and has greater horizontal than vertical dimensions, so as to produce extended top and bottom screen-surfaces, while the lower portion of the smoke-box is left free for holding cinders. The usual discharge-pipe, as shown, is provided in the bottom of the smoke-box.

It is evident that parts of the screen-body—such as its ends, for instance—may be of im-perforate sheet-iron without departing from the spirit of the invention; but it is evident that the best conditions are obtained when the maximum screen-surface is provided. A thimble, *E*, passes through the top side of the screen and is secured thereto. This thimble projects up into the base of the stack, connecting the space inclosed by the screen with the stack.

It will be seen that the complete inclosing-body formed by the screen extends lengthwise of the long smoke-box within the upper portion of the same, thus leaving the bottom of the smoke-box free for holding the cinders which will not rest in contact with the screen-surface.

The screen-body occupies practically the entire upper portion of the smoke-box, leaving an open space beneath it for the reception of the cinders.

F is the exhaust-nozzle, which is located in the bottom of the smoke-box. A directing-pipe, *G*, rises from the nozzle and passes through the bottom of the screen. This directing-pipe is raised off of the nozzle by legs *f*, so that its lower end is left open.

H is the inclosing-pipe, which is larger than the directing-pipe and surrounds such directing-pipe. This inclosing-pipe rests on the nozzle at its lower end, closing the space around the directing-pipe at its lower end. The inclosing-pipe *H* may pass through the bottom of the screen, as seen in Fig. 2, or it may stop short of the screen, in which case its open upper end will be protected by a separate inclosing-screen, *I*, as seen in Fig. 1. With either arrangement a hood, *K*, is preferably used, extending from the directing-pipe below its open upper end over the end of the inclosing-pipe, so as to prevent any possible interference between the exhaust-pipe and the draft entering the inclosing-pipe.

What I claim is—

1. In a locomotive having a long smoke-box, the combination, with the stack and exhaust, of a protecting-screen constructed as a complete inclosing-body, with which the stack and exhaust are connected, such screen-body having greater horizontal than vertical dimensions and provided with extended top and bottom screen-surfaces, and such screen-body being further located in the upper portion of the smoke-box, so as to leave the lower portion of the smoke-box free for holding cinders, substantially as set forth.

2. In a locomotive having a long smoke-box, a protecting-screen constructed as a complete inclosing-body, with which the stack and exhaust are connected, such screen-body having greater horizontal than vertical dimensions and provided with extended top and bottom screen-surfaces, and such screen-body being further located in the upper portion of the smoke-box, so as to leave the lower portion of the smoke-box free for holding cinders, in combination with a pipe in the bottom of the smoke-box for discharging the cinders, substantially as set forth.

3. In a locomotive having a long smoke-box, the combination, with such long smoke-box and with the stack and exhaust, of a protecting-screen located in the upper portion of such smoke-box and extending lengthwise thereof, such screen being a complete inclosing semi-cylindrical body conforming to the shape of the walls of the upper portion of the smoke-box, from which it is separated by a uniform space, the stack and exhaust being connected, respectively, with the upper and lower sides of such screen-body, substantially as set forth.

4. In a locomotive, the combination, with a short exhaust-nozzle, of a directing-pipe rising from the nozzle and having an open lower end, and a pipe inclosing the directing-pipe, such inclosing-pipe being closed at its bottom and open at its top, substantially as set forth.

5. In a locomotive, the combination, with a short exhaust-nozzle, of a directing-pipe rising from the nozzle and having an open lower end, a pipe inclosing the directing-pipe, such inclosing-pipe being closed at its bottom and open at its top, and a screen protecting the open upper end of the inclosing-pipe, substantially as set forth.

6. In a locomotive, the combination, with a short exhaust-nozzle, of a directing-pipe rising from the nozzle and having an open lower end, a pipe inclosing the directing-pipe, such inclosing-pipe being closed at its bottom and open at its top, and a hood over the open upper end of the inclosing-pipe, substantially as set forth.

7. In a locomotive, the combination, with the stack and a protecting-screen, of a short exhaust-nozzle, a directing-pipe rising from the nozzle and having an open lower end, and a pipe inclosing the directing-pipe and closed

at its lower end and open at its upper end,
substantially as set forth.

8. In a locomotive, the combination, with
the stack and a protecting-screen constructed
5 as a complete inclosing-body, of a short ex-
haust-nozzle, a directing-pipe rising from the
nozzle and having an open lower end, and a
pipe inclosing the directing-pipe and closed

at its lower end and open at its upper end,
substantially as set forth.

This specification signed and witnessed this
3d day of January, 1888.

GEORGE B. TAYLOR.

Witnesses:

W. A. HOUSELL,
J. C. TAYLOR.

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