

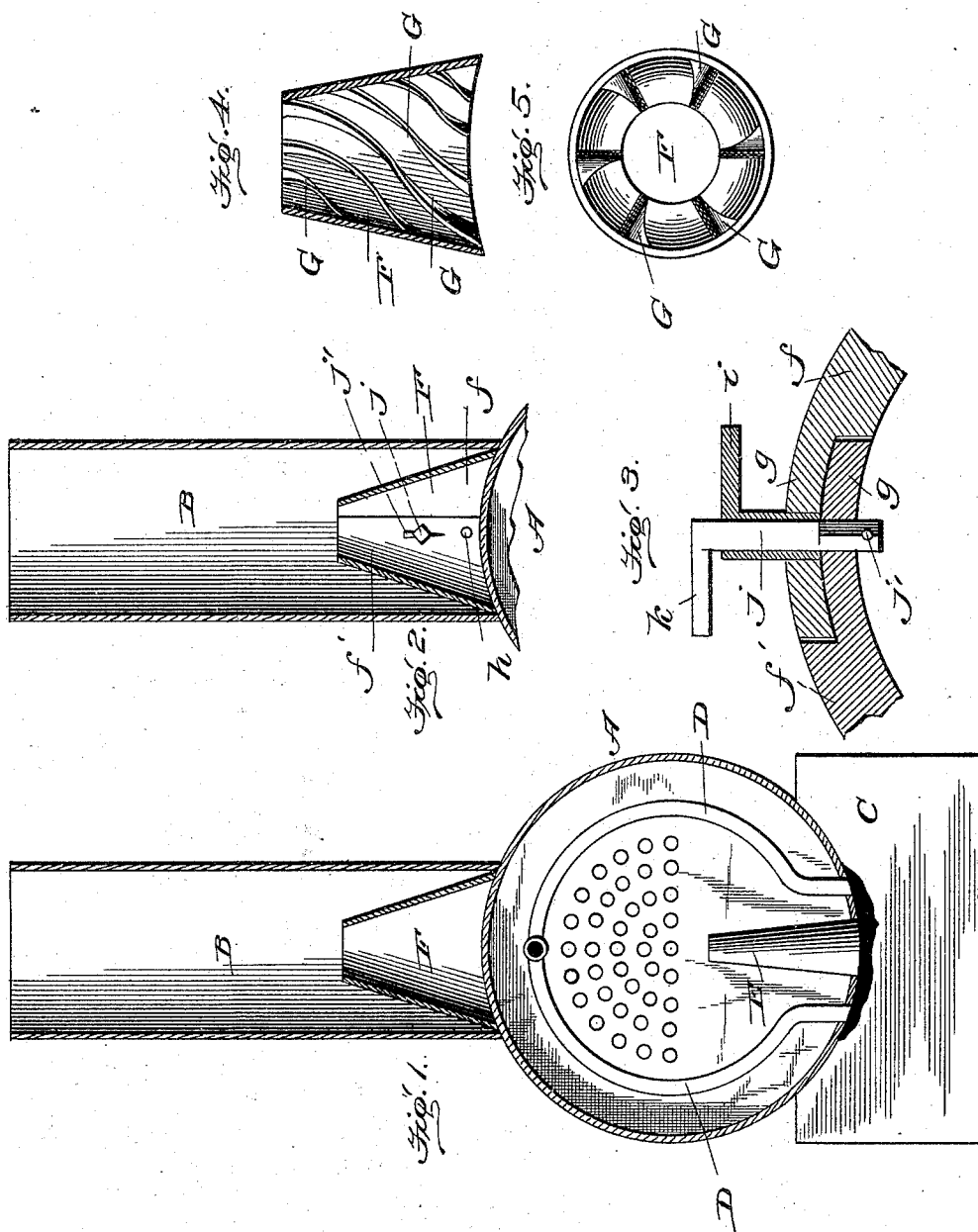
(No Model.)

F. STRATTNER.

DRAFT REGULATOR FOR LOCOMOTIVE SMOKE STACKS.

No. 492,246.

Patented Feb. 21, 1893.



WITNESSES:

Wm. C. Oschier
Arthur L. Bryant

INVENTOR

Fredrick Strattnr
BY Edw. Bros.
ATTORNEYS.

UNITED STATES PATENT OFFICE.

FREDERICK STRATTNER, OF SALISBURY, MARYLAND, ASSIGNOR OF ONE-HALF TO WILLARD THOMSON, OF WILMINGTON, DELAWARE.

DRAFT-REGULATOR FOR LOCOMOTIVE SMOKE-STACKS.

SPECIFICATION forming part of Letters Patent No. 492,246, dated February 21, 1893.

Application filed December 9, 1892. Serial No. 454,646. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK STRATTNER, a citizen of the United States, residing at Salisbury, in the county of Wicomico and State of Maryland, have invented certain new and useful Improvements in Draft-Regulators for Locomotive Smoke-Stacks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to smoke-stacks for locomotive furnaces, and the object in view is to secure a steady uniform draft through the smoke-box or chamber and stack of the furnace, particularly where artificial draft is used such as exhaust or live steam as is usual in the case of locomotive furnaces. I accomplish this end in a simple and inexpensive manner by providing a tapered nozzle or pipe which is secured in the lower part of the smoke-stack, with its large open end arranged to receive the exhaust-steam and smoke from the smoke-box of a locomotive-furnace. As the smoke and steam pass rapidly from the smoke-box directly into the tapered nozzle or pipe, they are contracted or condensed as they pass through said pipe, and when they emerge from the tapered nozzle or pipe into the larger surrounding space of the smoke-stack, they are free to again expand. This tapered nozzle or pipe situated at the opening between the smoke-stack and the smoke-chamber or box of the locomotive furnace, serves to prevent any backflow or pressure of atmospheric air into the smoke-box and also to partially condense the escaping steam and smoke, whereby the draft through the smoke-stack and smoke-box is made more regular and uniform.

For the purpose of varying the size of the exit of the tapered condensing nozzle or pipe, to determine the area of the discharge orifice in the nozzle best calculated to give the most advantageous results, I contemplate making the tapered nozzle in sections, hinged or pivoted together at the lower end and having mechanical devices whereby the upper end can be spread apart or brought together to

vary the size of the exit at the top of the nozzle or pipe. I also contemplate the use of a series of spirally arranged ways or flanges on the inside of the tapered nozzle or pipe, which flanges converge in spiral lines from the bottom toward the top of the nozzle and serve to give to the passing steam and smoke, as the same impinge against the flanges, a whirling motion while passing through the nozzle.

I have illustrated my improvements in the accompanying drawings, forming a part of this specification, and in which:—

Figure 1 is a vertical sectional view through so much of a locomotive-furnace as is necessary to a proper understanding of my invention. Fig. 2 is an enlarged sectional view, at right angles to Fig. 1, showing the steam-condensing nozzle made in adjustable sections. Fig. 3 is a detail sectional view to illustrate the form of joint between the nozzle sections and the means for moving each section independently of the other. Figs. 4 and 5 are sectional and plan views, respectively, of a steam-condensing nozzle with internal spiral flanges.

Like letters of reference denote like parts in all the figures of the drawings, referring to which:—

A designates the smoke-box of a locomotive-furnace, B is the smoke-stack, C the steam chests, D the live steam pipes arranged within the smoke-box and discharging into the steam chests, and E the exhaust-nozzle which receives the exhaust steam from the chests and discharges into the smoke-box immediately below the smoke-stack, all of which parts are arranged and operated in a manner well known to those skilled in the art to which my improvement relates.

F is my tapered nozzle which is secured in the lower part of the stack B immediately above the smoke-chamber or box A of the locomotive-furnace. This tapered nozzle is arranged in a vertical position, with its large open end next to the smoke-box to receive the smoke and exhaust steam directly therefrom; and the contracted upper end of this tapered nozzle projects well up into the smoke-stack

which surrounds the same. This nozzle is preferably made of one imperforate piece, suitably secured at its lower end in the smoke-stack; and as the exhaust steam escapes from the nozzle, it expands in the smoke-box, mingles with any smoke therein, and the steam and smoke then pass through the nozzle *F* which serves to partially condense the steam and smoke as they pass through the nozzle, after which the steam and smoke pass into the smoke-stack where they are allowed to expand. In this manner, the draft through the smoke-box and smoke-stack is made more regular and uniform, and the nozzle prevents any back flow of atmospheric air into the smoke-box.

The tapered nozzle is provided on its inside with a series of flanges *G* which are arranged spirally within the nozzle and extend from the lower end thereof to the upper contracted end, said flanges serving to give to the steam and smoke a whirling motion as they pass from the smoke-box through the nozzle into the smoke-stack. I do not, however, restrict my invention to the nozzle made in a single imperforate piece, as it can be made of adjustable sections or parts so connected that the upper exit end thereof can be made larger or smaller so that the area of the exit opening can be varied to secure the best results in practice. The nozzle can be made in two sections *f, f'*, having the same generally tapered form, and with their adjacent side edges beveled or cut away to form the lap joints, *g, g*, so that when the sections are expanded or contracted the side edges of the sections will be closed together. At one side, the sections are connected together by a pivotal bolt, *h*, while at the other side the sections are pivotally connected by devices which enable the sections to be moved relatively to each other so that the area of the exit at the top of the nozzle can be increased or diminished. To one of the sections, *f*, of the nozzle is secured a sleeve, *i*, having a crank or handle *i'* so that the section can be moved; and through this sleeve passes a short pivotal shaft *j*, having its inner end made square or of other polygonal form and fitted in a corresponding opening in the other section, *f'*, of the nozzle. The inner end of this shaft is thus connected to the section *f'* of the nozzle, and it has a key *j'* to prevent endwise movement of said shaft, while its outer end has a crank or handle *k* by which it can be conveniently turned to adjust the section *f'* of the nozzle. The sleeve and shaft pass through a suitable opening in the side of the smoke-stack, and the cranks thereon are arranged outside of the smoke-stack so that the nozzle sections can be easily manipulated from the outside of the smoke-stack.

The operation and advantages of my invention will be readily understood and appreci-

ated by those skilled in the art from the foregoing description taken in connection with the drawings.

I am aware that changes in the form and proportion of parts and details of construction of the mechanism herein shown and described as an embodiment of my invention can be made without departing from the spirit or sacrificing the advantages thereof, and I therefore reserve the right to make such modifications as fairly fall within the scope of my invention.

I would have it understood that I do not strictly confine my invention to a furnace of a locomotive steam engine, as it is evident that the improvements can be used in connection with other forms of furnaces or boilers; nor do I strictly limit myself to the condensing nozzle made circular in cross section as said nozzle can be made square or of other desired form in cross section although it is tapered longitudinally, for the purposes explained.

What I claim as new is—

1. The combination with a smoke-box, an exhaust nozzle therein, and a smoke-stack, of a tapered nozzle situated in the lower part of the smoke-stack, with its large open end in position to receive from the smoke-box and exhaust nozzle and with its contracted discharge end projected up into the smoke-stack, substantially as and for the purpose described.

2. The combination with a smoke-box and a smoke-stack, of a tapered nozzle situated within the lower part of said smoke-stack and provided with a series of internal spiral flanges, substantially as and for the purpose described.

3. The combination with a smoke chamber and a smoke stack, of a tapered nozzle situated in the lower part of the smoke stack to receive from the smoke chamber and constructed in sections adapted to be expanded or contracted, and means for moving either section independently of the other, substantially as and for the purpose described.

4. The combination with a smoke chamber and a smoke-stack, of a tapered sectional nozzle situated in the lower part of the smoke stack to receive directly from the smoke chamber and having its members or sections pivoted for independent adjustment, and means, substantially as described, for moving either section of the nozzle independently of the other section, as set forth.

5. The combination with a smoke chamber and a smoke stack, of a tapered nozzle situated in the lower part of the smoke stack to receive directly from the smoke chamber and comprising the pivoted sections provided at their contiguous edges with the lap joints, and one of these sections having means for moving the same toward or from the other sec-

tion, substantially as and for the purpose described.

5 6. A tapered nozzle, substantially such as described, consisting of the sections having the lap joints along their contiguous edges, a sleeve rigid with one of the sections and provided with a handle, and a pivotal shaft passing through the sleeve and having one end rigid with the other section and its outer end

provided with an operating crank, as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK STRATTNER.

Witnesses:

JEROME TUBBS,

M. V. BREWINGTON.