(No Model.) 2 Sheets—Sheet 1.

C. H. SCHARAR.

DEVICE FOR CREATING DRAFT.

No. 456,435. Patented July 21, 1891.

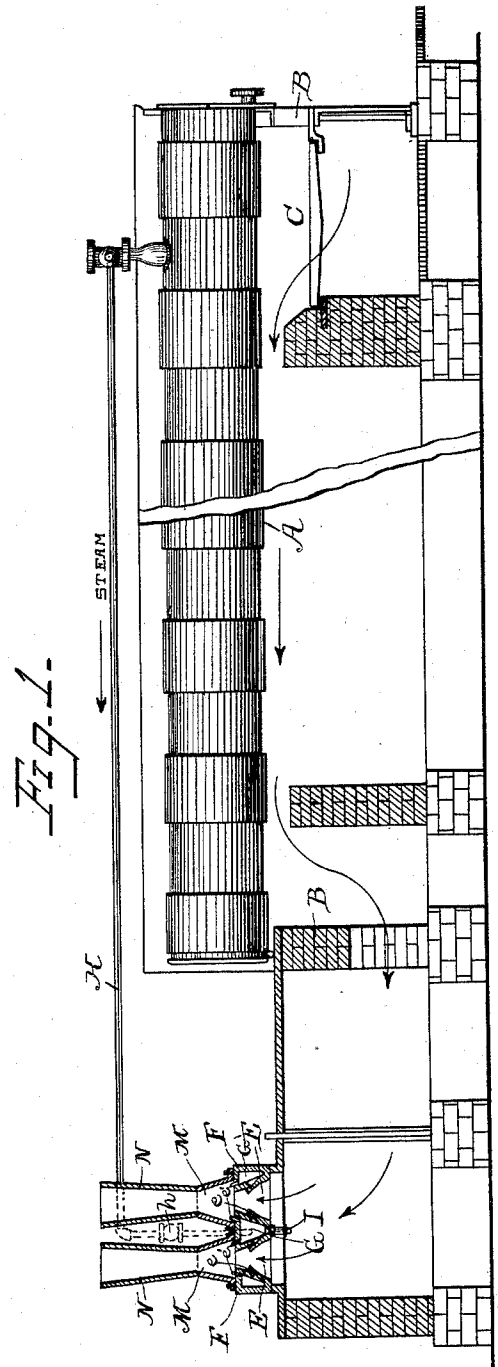

Fig. 1.

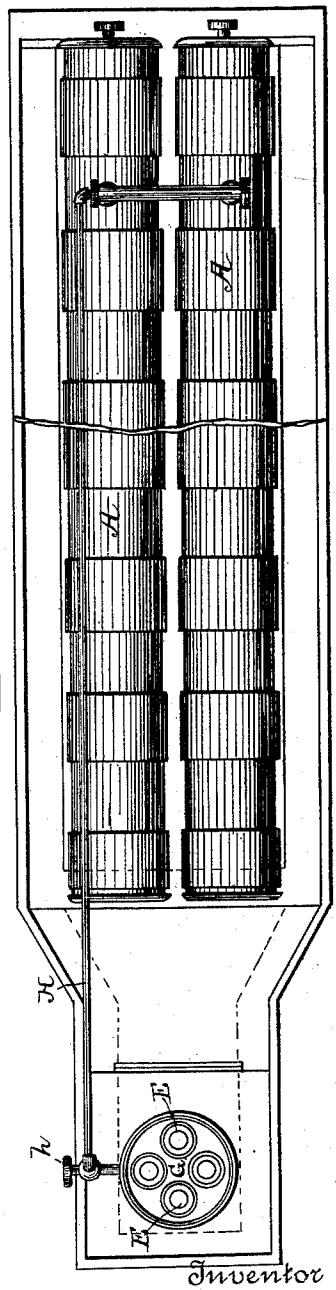

Fig. 2.

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E. Popkins.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

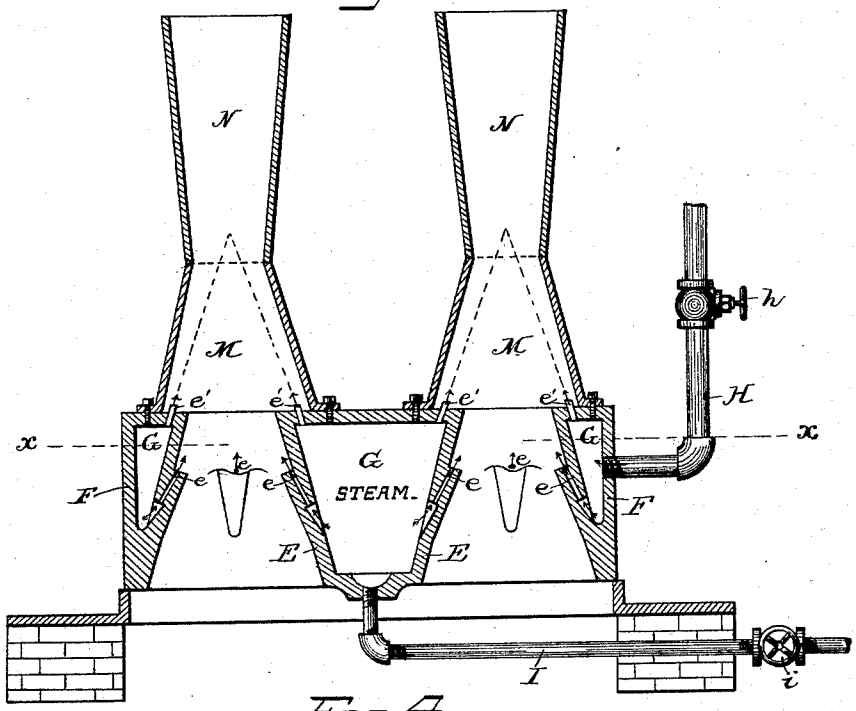
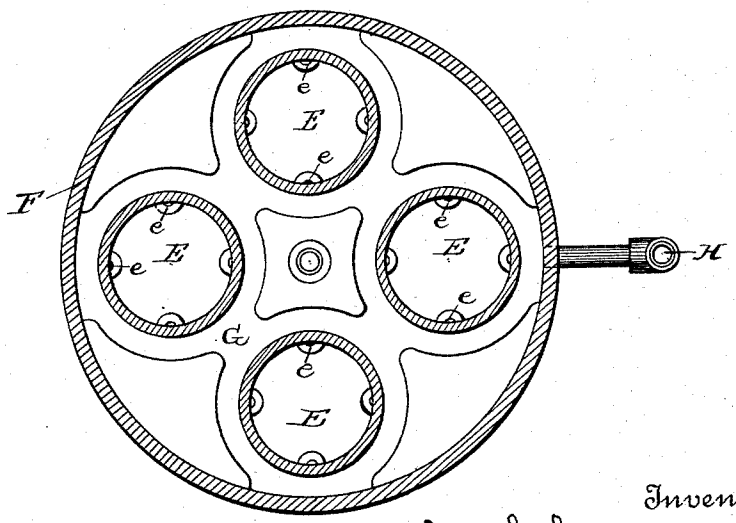


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHRISTIAN H. SCHARAR, OF SCRANTON, PENNSYLVANIA.

DEVICE FOR CREATING DRAFT.

SPECIFICATION forming part of Letters Patent No. 456,435, dated July 21, 1891.

Application filed October 10, 1890. Serial No. 367,670. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN H. SCHARAR, of Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Devices for Creating Draft; 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 improvements in devices for creating draft.

The object is to provide simple and effective means more particularly adapted to use in connection with steam-generating furnaces, whereby a draft of great force may be formed at pleasure with the loss or expenditure of a minimum amount of steam-force.

A further object is to provide improvements so that water, steam, or other gases when compressed or in their natural state will cause much greater expansion than in the old device, Patent No. 418,818, granted to me on the 7th day of January, 1890.

A further object, in addition to the above, is to so vary the location of the nipples as to enable repairs to be made, such as replacing the nipples while the device is in operation.

A further advantage is that the device may be used with or without a smoke-stack.

With these ends in view my invention consists in certain features of construction and combination of parts as will be hereinafter described and pointed out in the claim.

In the accompanying drawings, Figure 1 represents a longitudinal vertical section of a steam-boiler furnace, showing my draft device in connection therewith. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged transverse section of the draft-increasing device, and Fig. 4 is a horizontal section on lines $x\,x$ of Fig. 3.

A represents the boiler.

In the present instance I have represented twin horizontal boilers set upon suitable supports B, through which the products of combustion from the furnace C pass.

The device consists of a group (in the present instance four are shown) of tubes E, contracted from their base upwardly, through which the products of combustion are obliged to pass to escape. This group of contracted passages is provided around the walls of each passage below the more contracted portion of the passage with several openings leading from without the tubes E upwardly through the walls of the tubes to the interior thereof. These openings are represented by the letter *e*, and their slant is such as to cause the steam issuing therethrough to tend to focus a short distance above the more contracted ends of the tubes. The openings *e* are reduced by inserting a plug or nipple having a small hole through which the steam escapes. The group of contracted tubes E is surrounded by a casing F, completely inclosing the side walls of the group and forming a chamber or steam-space G, encircling the sides of each one of the tubes of the group.

On the top of the casing F are located the cone-shaped tubes M, provided with flanges bolted to the casing, the said cones being placed over each one of the contracted ends of the tubes E and having a diameter sufficiently large to leave a circular space bounded by the apex of the tubes E and circumference of the base of the tubes M, and of sufficient width to receive the nipples *e'*, and having oblique passages connecting with the steam-chamber G formed by the casing F, so that steam, water, air, or other fluids contained in the chamber G are so directed as to fill as nearly as possible the more contracted ends of the cone-shaped tubes M.

On the end of the apex of each tube M is riveted the sheet-iron expanding-tube N.

The chamber or steam-space G is connected with the steam-space of the boiler by a pipe H, provided with a suitable stop-cock *h*, for regulating the supply of steam. A return or waste pipe I, provided with a stop-cock *i*, is also connected with the lower portion of the steam-space G, for the purpose of removing water of condensation from the space. With this combination the effect produced is as follows: The steam, water, air, or gases from the oblique passages *e* in the lower series, being so directed as to close as nearly as possible the more contracted ends of the tubes E, continue to expand in their passage through the cone-shaped tubes M. Steam, water, air, or other fluids issuing from the nipples or oblique openings *e'* of the upper series, which are placed alternately with those of the lower

series, is also directed so as to fill the more contracted ends of the cone-shaped tubes M, which, together with the expanding steam from the oblique passages *e* of the lower series, tend to entirely fill the contracted ends of the tubes M, thus causing a more complete vacuum. The steam and gases in their further passage through the expanding tubes act expansively, and are finally discharged into the open air, thus preventing any return air-current.

When the device is used to generate its own steam, or when it may be necessary to use air or other gases, which may require a larger generating-space G, or for any other cause, passages *e* may be closed, and the upper series *e'* may be used to the same end or purpose, as was designed in the original patent.

What I claim is—

In combination, a group of contracted tubes having inclined openings in their sides, a casing forming a steam-space surrounding said tubes, a group of cone-shaped tubes supported on the casing over the contracted tubes, the casing being provided with escape-openings between the upper and lower tubes, expanding-tubes secured to the upper ends of the upper tubes, a feed-pipe connecting the steam-space with the boiler, and a return-pipe leading from the center of the bottom of said space, as specified.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHRISTIAN H. SCHARAR.

Witnesses:
THOS. SHOTTON,
ISAAC A. REICHARDT.