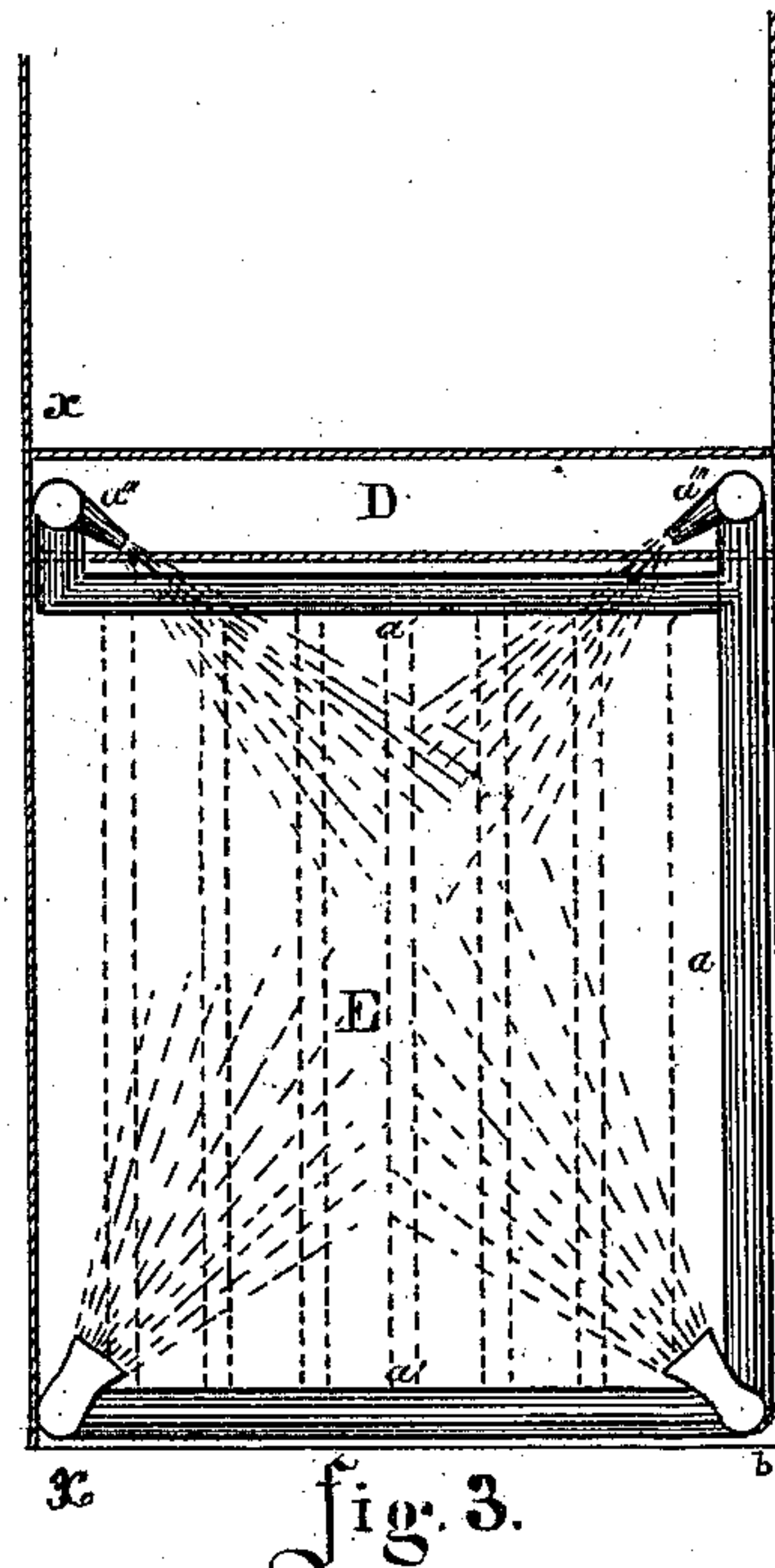
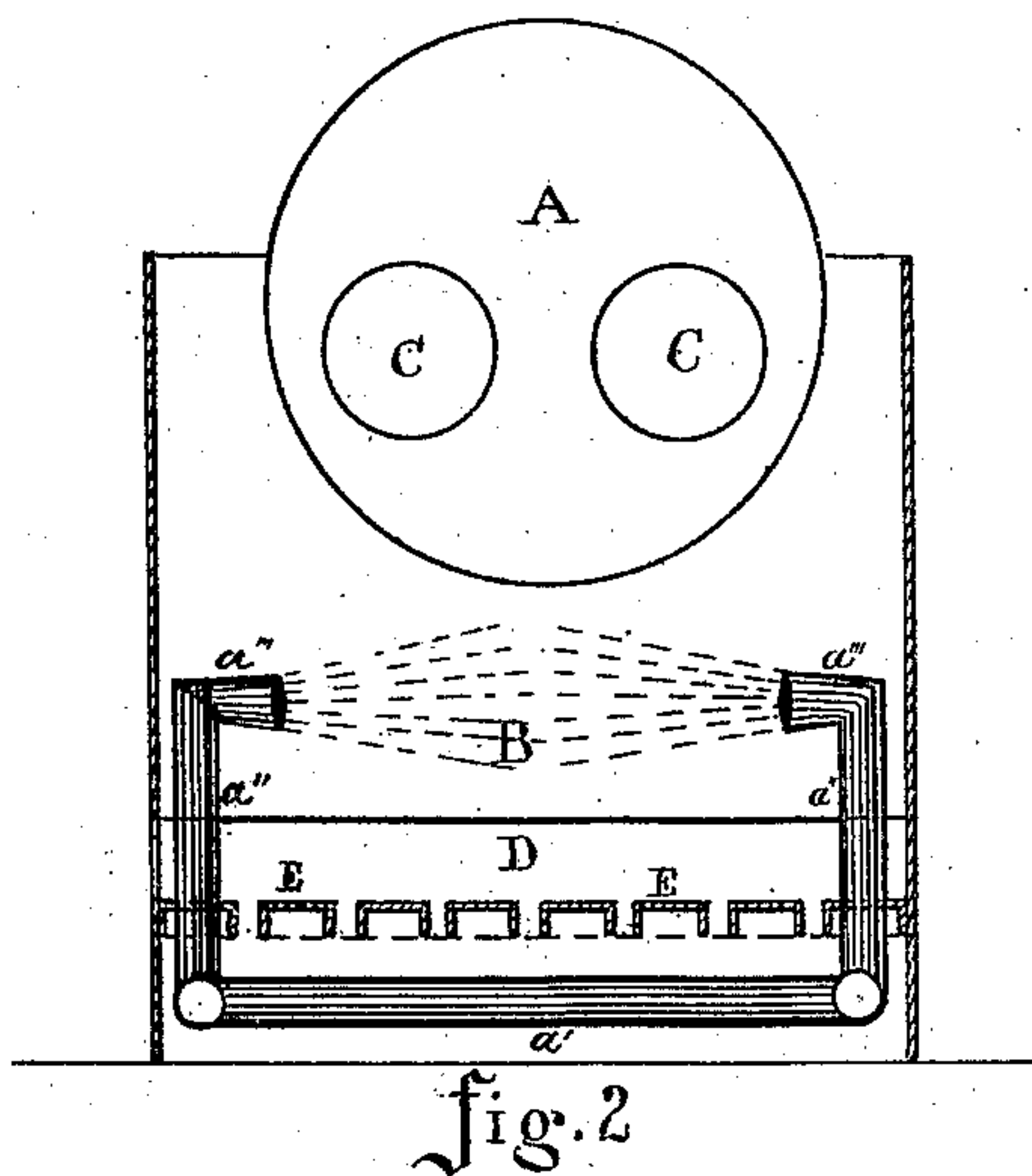
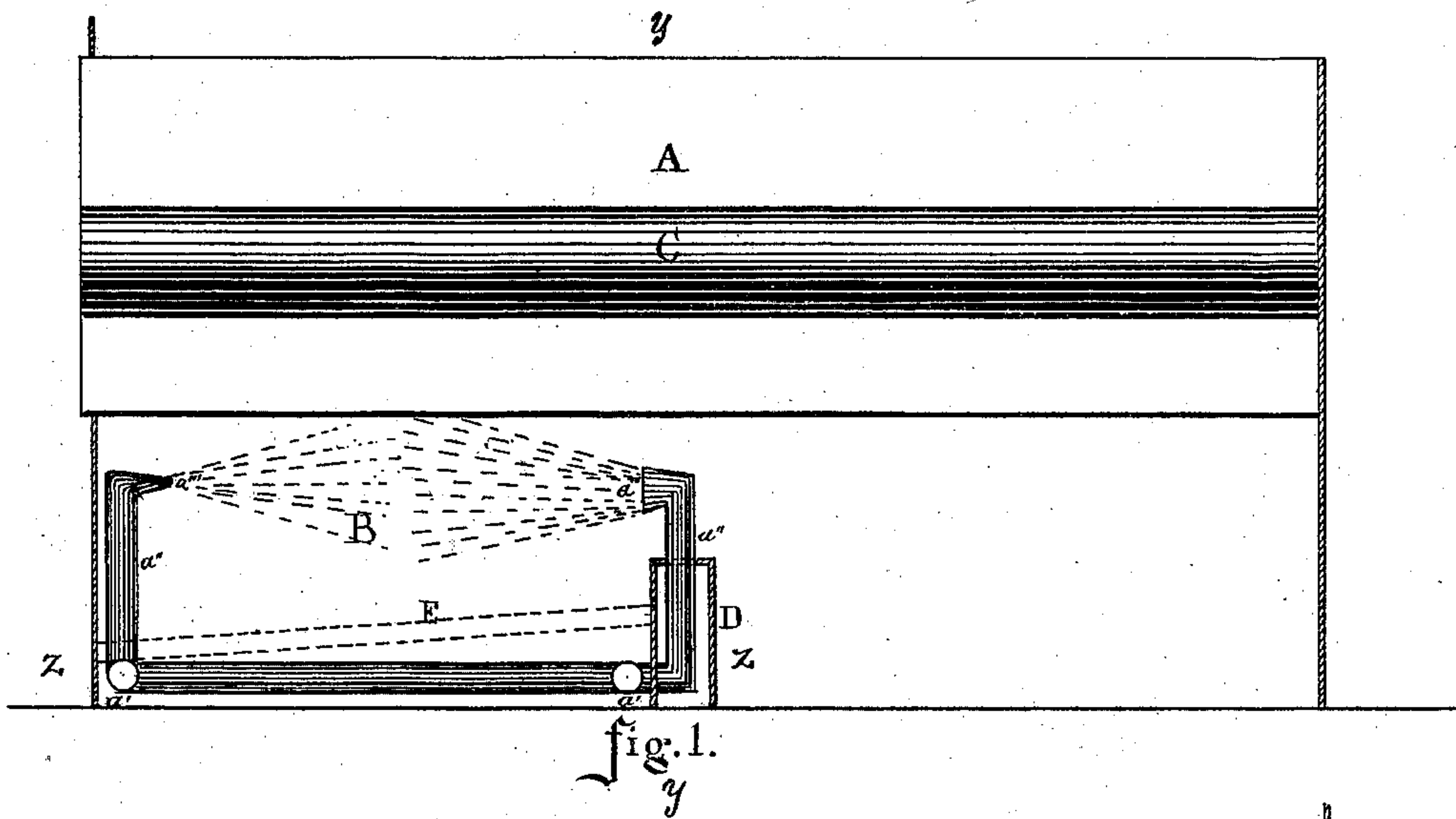


C. G. SCHLOTTERBECK & C. F. KNEISLY.
 DEVICE FOR SUPPLYING STEAM TO BOILER FURNACES.
 No. 173,501. Patented Feb. 15, 1876.



Witnesses
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 E. A. Bulley

Inventor
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UNITED STATES PATENT OFFICE.

CHRISTIAN G. SCHLOTTERBECK AND CHRISTIAN F. KNEISLY, OF DAYTON,
OHIO.

IMPROVEMENT IN DEVICES FOR SUPPLYING STEAM TO BOILER-FURNACES.

Specification forming part of Letters Patent No. **173,501**, dated February 15, 1876; application filed
August 12, 1875.

To all whom it may concern:

Be it known that we, CHRISTIAN G. SCHLOTTERBECK and CHRISTIAN F. KNEISLY, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Boiler-Furnaces; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a longitudinal vertical section of a boiler and furnace, with improvement attached, on line *x x* of Fig. 3. Fig. 2 is a transverse vertical section on *y y* of Fig. 1. Fig. 3 is a horizontal section on line *z z* of Fig. 1.

A represents any ordinary boiler-shell. B is the fire-box; C C, flues in the boiler. D is the bridge wall; E, grate-bars.

This invention relates to devices for promoting the combustion of fuel in the furnaces of steam-generators, by causing a more perfect combustion of the gases generated therein; and it consists in the combination and arrangement of certain pipes for conducting steam from the generator to its furnace for the accomplishment of the purposes named, as will be more fully described hereinafter.

It is a well-known fact that in the burning of fuel in the furnaces of steam-generators in the usual manner, and when only what is termed a "natural draft" is used, there is a great loss consequent upon the escape therefrom of what is usually denominated "smoke," but which consists, in part, at least, of unconsumed gases, which, if properly mixed with air or oxygen in the requisite quantities before leaving the furnace, would be consumed, and thus be made to produce large economy in the consumption of fuel.

The combination and arrangement of the parts composing this improvement are designed to produce the results above named; and to accomplish this we provide a series of pipes, *a*, made, preferably, of cast-iron, and which extend across the sides and rear of the

furnace and below the grates. The reason for thus locating said pipes being, first, the placing them in a position where they will not be destroyed by the intense heat generated in the furnace, and, second, placing them where they will receive a portion of the heat radiated from the fuel upon the grate, and thus admit of the steam which passes through them being superheated to some extent.

It will be seen by referring to Fig. 1 of the drawing, that the pipe *a'*, which passes across the rear of the furnace, is inside of the bridge wall, and that the pipe *a* extends beyond it and into the hollow bridge wall. Within the space in said wall there rise two vertical pipes, *a'' a''*, which extend upward sufficiently high to cause the right-angle outlets, which are placed upon their upper ends, to be above the fuel upon the grates. The outlets of these right-angled portions have vertically-elongated apertures, through which the steam passes, and is directed to the center of the furnace.

In the two front corners of the furnace there are placed vertical pipes *a''*, similar to those described, except that their outlets are elongated horizontally, and are so placed that the steam issuing from them is also directed to the center of the furnace, their location and operation being clearly shown in Fig. 3 of the drawing.

As a consequence of the arrangement or location of these vertical pipes, they are placed in the coolest portions of the furnace, and are thus protected from the intense heat of the central and upper portions thereof.

Another important advantage arising from this arrangement is that the gases generated in these remote portions of the furnace are forced by the issuing steam to the center thereof, and are made to pass over the incandescent portion of the fuel, as a consequence of which they are ignited, and caused to aid in the generation of steam, instead of passing off in an unburned condition and thus wasted, as is the case in furnaces constructed without our improvements.

We have shown our improvements as applied to an ordinary furnace, and to a two-flue boiler; but they are equally applicable to that

type of boilers in which the fire-box forms a part of the same, the only change necessary being that the vertical pipes in the rear corners be caused to ascend within the furnace instead of within the bridge wall.

In the present case, A represents a cylindrical boiler, having two flues, C C, passing through it; B the furnace, in which the fuel is burned, and into which the steam is injected, and E the grates.

One of the most important features of our invention consists in the fact that the discharge orifices of the steam-pipes are elongated, and their largest diameters placed in opposite directions, as a consequence of which the jets are made to act upon a much greater area of the surface of the fire-box, and to come in contact with a much larger portion of the gases contained therein.

The steam used in these pipes may be ad-

mitted at any convenient point by providing the place with a suitable connection to which to attach it.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

Vertical pipes arranged in the corners of a furnace, and having elongated discharge-orifices, two of which are vertical and two horizontal, in combination with supply-pipes, arranged under the grate-bars of a furnace, substantially as and for the purpose set forth.

In testimony that we claim the foregoing as our own invention, we affix our signatures in presence of two witnesses.

CHRISTIAN G. SCHLOTTERBECK.

CHRISTIAN F. KNEISLY.

Witnesses:

GEO. M. YOUNG,

E. S. YOUNG.