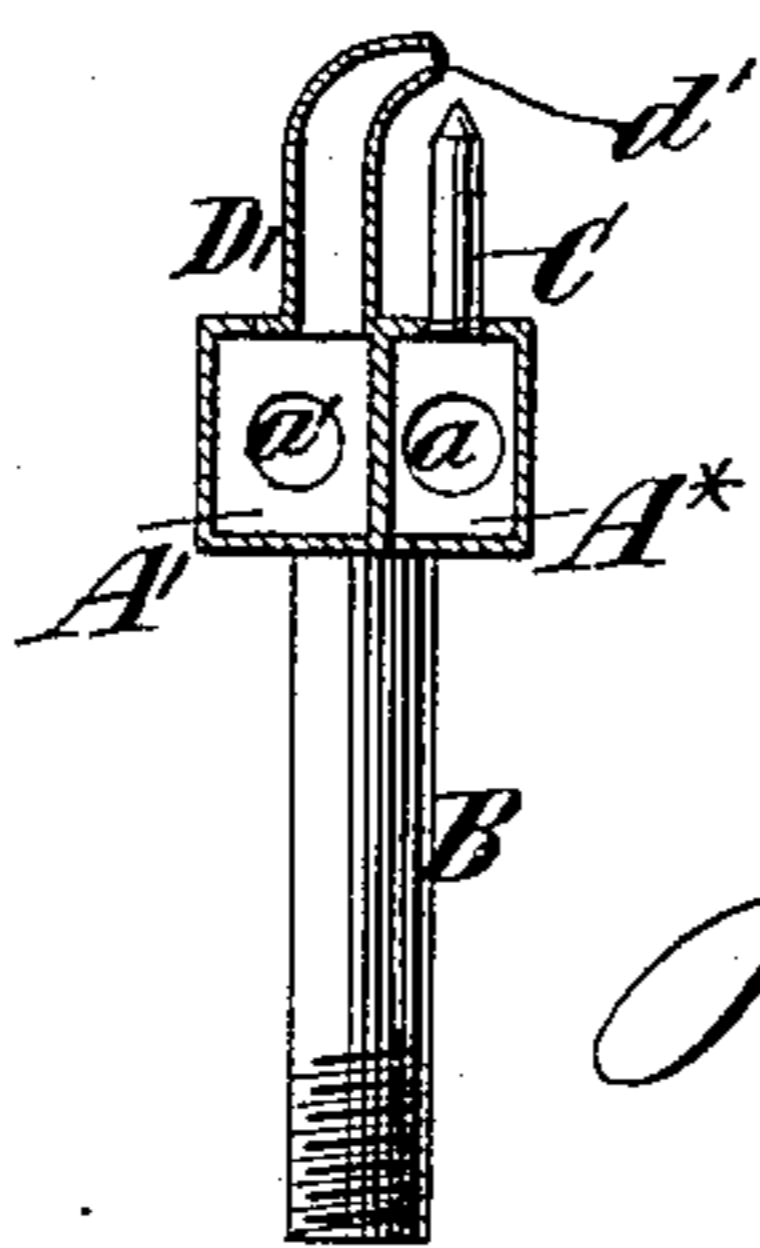
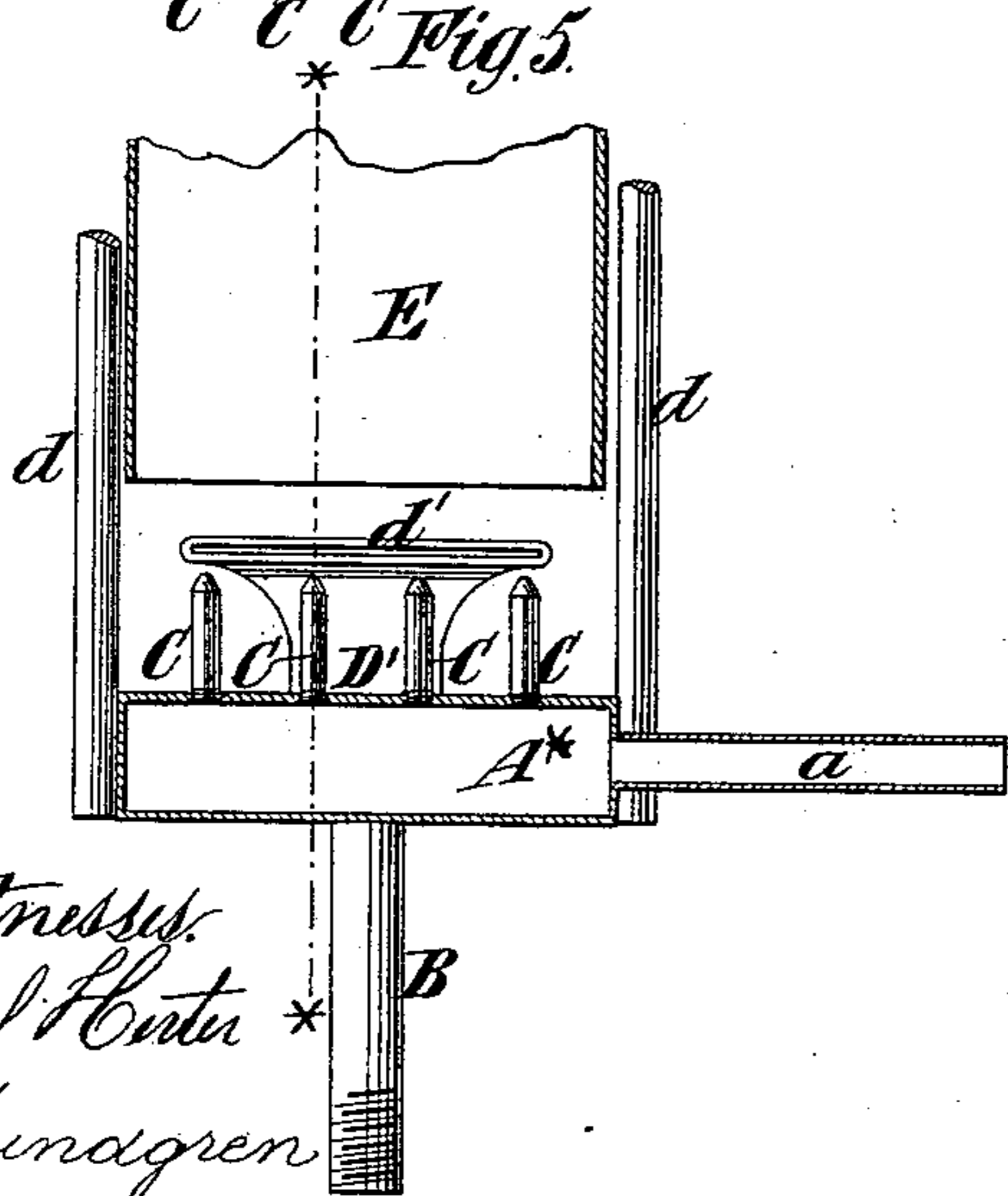
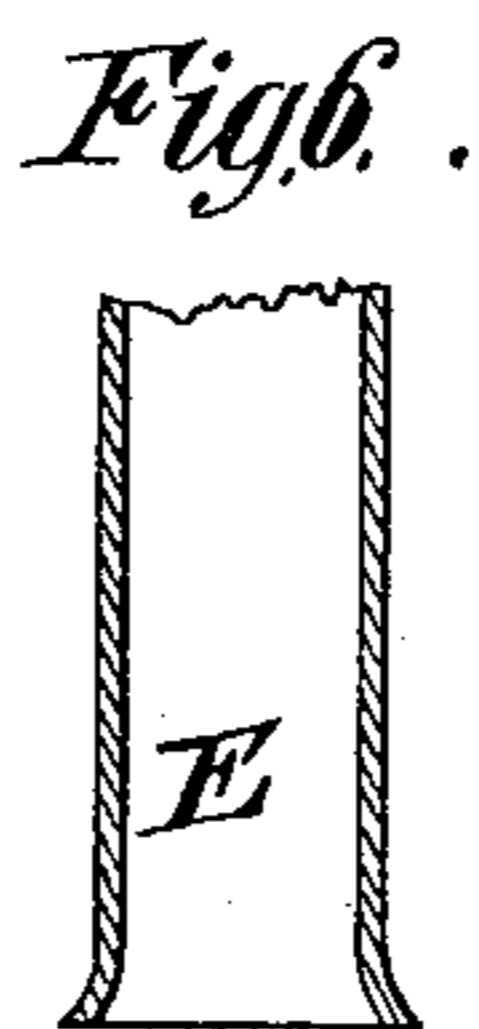
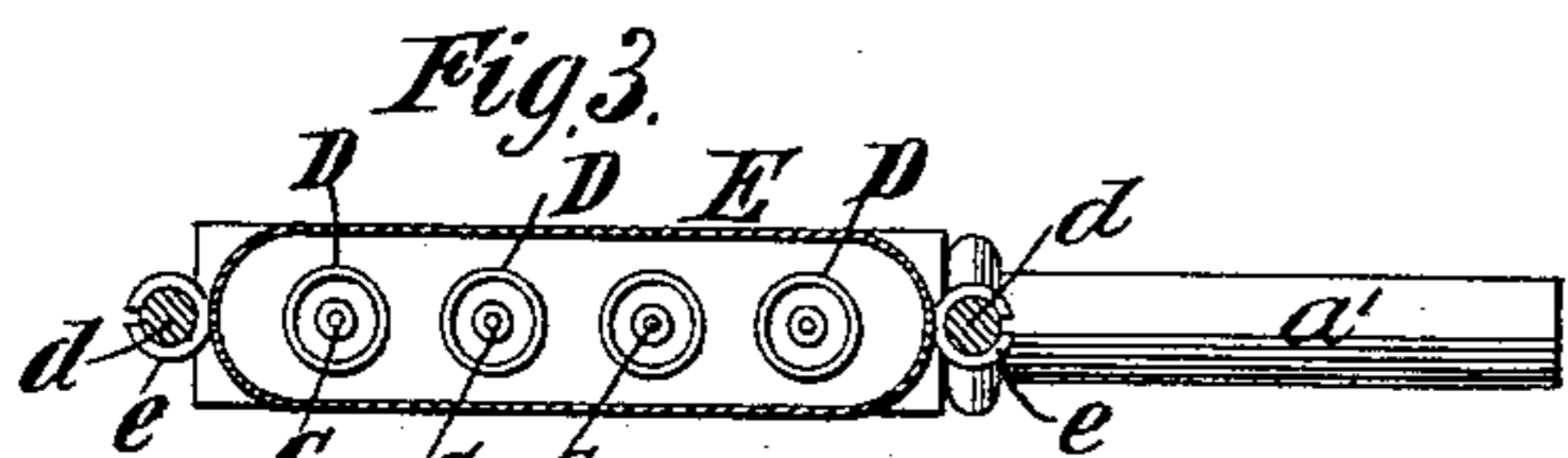
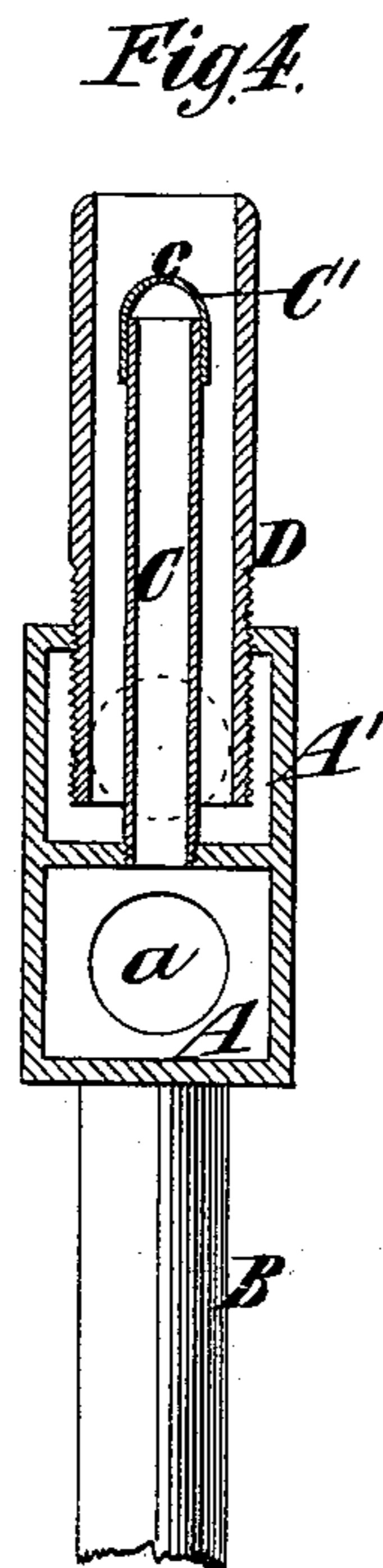
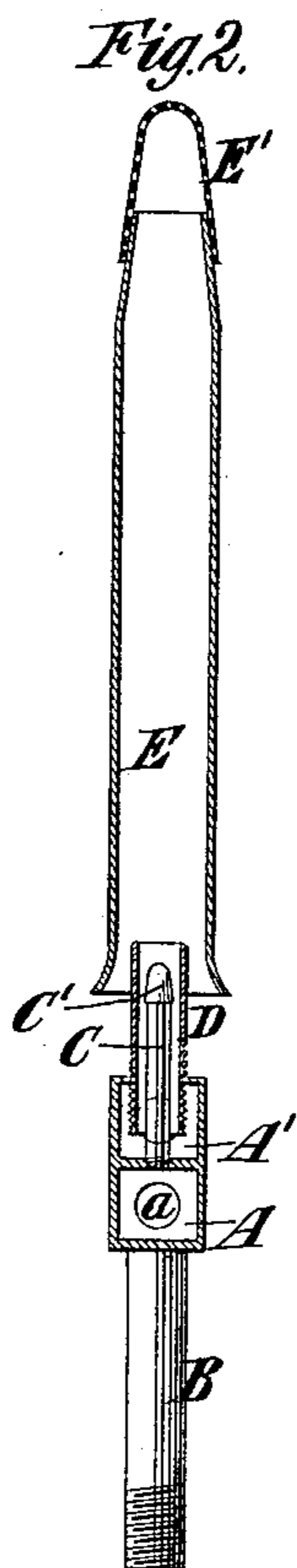
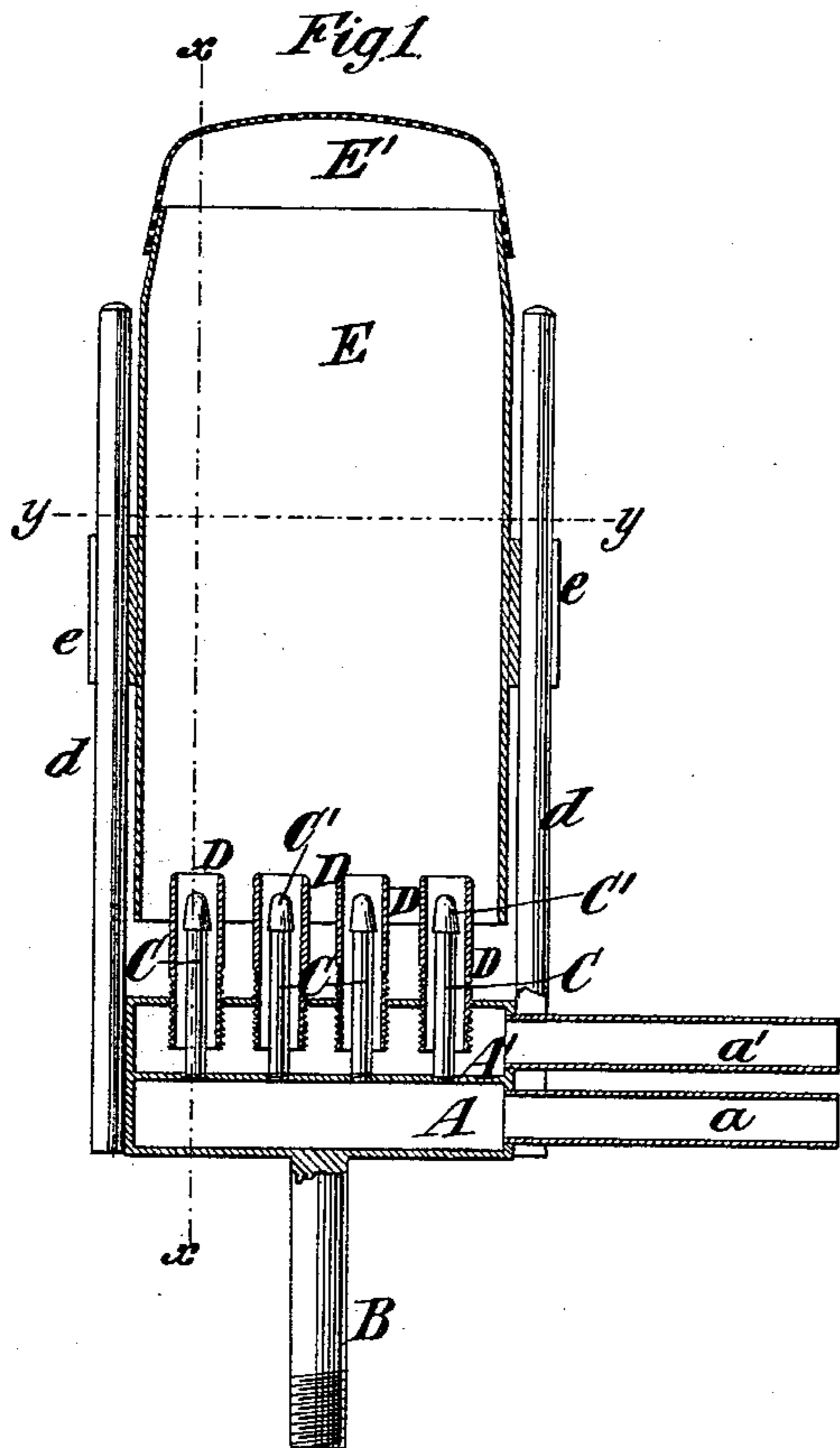


(No Model.)

J. C. ENGLISH.
GAS BURNER.

No. 335,439.

Patented Feb. 2, 1886.



Witnesses:
Emil Hunter *
O. Sundgren

Inventor:
John C. English
by his atty
Brown & Hall.

UNITED STATES PATENT OFFICE.

JOHN C. ENGLISH, OF NEW YORK, N. Y.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 335,439, dated February 2, 1886.

Application filed November 13, 1885. Serial No. 182,668. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. ENGLISH, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Gas-Burners, of which the following is a specification.

My invention relates to that class of burners which comprises burner-tubes for delivering jets of gas and compressed air or gas and steam, a surmounting chimney through which the gas and compressed air or steam ascend, and also through which a current of atmospheric air is induced to mingle with the gaseous mixture before it is burned at the top of the chimney, the chimney being surmounted by a cap of platinum gauze or other material which is heated to bright incandescence by the burning of the mixture.

In such burners as heretofore constructed there has been employed a single burner-tube, or a pair of tubes arranged one within the other, for supplying gas and compressed air or steam, and the chimney, which is arranged above the burner-tubes, and which is surmounted by platinum gauze or other material which will become incandescent by heat, has been of circular form. I have found that in such a burner, when the size of the circular chimney and platinum-gauze cap are increased in order to obtain a large extent of incandescent surface, the mixture of gas and air or steam is apt to drop or pass downward in the chimney and burn at the bottom thereof, thereby failing to render the platinum cap incandescent.

The object of my invention is to provide for increasing the area of the light-giving platinum cap to any degree desired, and at the same time to insure the chimney being filled with a column of gas and air which moves constantly upward, and prevents the downward flow of any of the mixture to the bottom of the chimney, to be there burned without result.

To this end my invention consists in the combination, with two or more burner-tubes arranged in line side by side for supplying two or more jets of combined gas and air or steam, of a chimney of flattened transverse section arranged above the burner-tubes, with its longer diameter parallel with the line of tubes, and its shorter diameter transverse to

the line of tubes, and having a surmounting cap of material which will become incandescent by heat, and supports on which the chimney is vertically adjustable to regulate the quantity of atmospheric air admitted to mingle with the gas.

The invention also consists in a minor combination of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical section of a burner for using air and gas which embodies my invention. Fig. 2 is a vertical section upon the plane of the dotted line $x x$, Fig. 1. Fig. 3 is a horizontal section upon the plane of the dotted line $y y$, Fig. 1. Fig. 4 is a vertical section, upon a larger scale and on the plane of the dotted line $x x$, Fig. 1, through the gas and air chambers and the inner and outer air and gas tubes. Fig. 5 is a vertical section of the lower portion of the burner embodying my invention, which is intended for using a mixture of steam, gas, and air; and Fig. 6 is a vertical section upon the plane of the dotted line $* *$, Fig. 5.

Similar letters of reference designate corresponding parts in all the figures.

Referring first to Figures 1, 2, 3, and 4, A and A' designate, respectively, air and gas chambers, which are arranged one above another, and, as here represented, in the same integral structure. Compressed air from any suitable source is supplied to the chamber A through the pipe a , and gas is supplied to the chamber A' through a pipe, a' .

B designates a rod projecting downward from the chambers and by which the burner may be supported.

Each of the individual burner tips or tubes which are employed in this apparatus consists of an inner air-tube, C, projecting upward from the chamber A, and the outer gas-tube, D, secured into the top of the chamber A', surrounding a corresponding air-tube and adjustable upward and downward relatively to the air-tube.

As best shown in Fig. 4, I may provide the air-tubes C each with a removable cap, C', provided at the top with a blast-aperture, c . These caps may be, if desired, screwed upon the upper ends of the air-tubes C, and as they are readily removable, I provide for using caps having blast-apertures c of different sizes.

The burner-tubes C D, &c., are arranged in line, and two or any greater number may be employed, four being here represented. Above the burner-tubes is a chimney or flue, E, which, as best shown in Fig. 3, is of flattened transverse section, arranged with its greater diameter parallel with the line of burner-tubes. This chimney or flue E has at the upper end a cap, E', which is of platinum gauze or perforated platinum, or of any other suitable material which will become incandescent by heat.

The chimney or flue E is preferably adjustable upward and downward relatively to the burner-tubes C D, and, as here represented, it is provided at opposite sides with guides or sockets *e*, which embrace and are adapted to slide upon guide-rods *d*, projecting upward from the bottom of the burner. The blasts of air issuing under more or less pressure from the burner-tubes C will induce the flow of gas through the outer surrounding tubes, D, and the mingled gas and air passing upward will also induce through the lower end of the chimney or flue E an amount of atmospheric air, which will be proportionate to the height at which the chimney or flue is adjusted relatively to the burner-tubes. It is necessary to take in a certain amount of air in the bottom of the chimney or flue E in order to prevent the burning of the mixture at that point, and it is desirable to have the chimney or flue vertically adjustable, in order that the amount of atmospheric air so admitted may be regulated to suit various conditions and circumstances dependent on the pressure of gas and air and the richness of the gas, and other circumstances which may vary in different localities.

It is advantageous to have two or more burner-tubes arranged in line with a chimney or flue having a flattened transverse section, because the whole area of the chimney or flue then becomes filled with a rapidly-ascending current of gas and air, and there is no danger of any downward current, which would result in the burning of the mixture at the bottom of the chimney or flue, where it would have no effect in heating the incandescing-cap E'.

In Figs. 5 and 6 I have represented portions of a burner which may be employed where steam and gas are used. In this case I have shown two chambers, A* A', arranged in the same structure side by side, and to which steam under pressure and gas are admitted by pipes *a a'*. The steam-chamber A* is surmounted by steam-nozzles C, which are arranged in a row side by side, four of which are here shown, and the gas-chamber A' is surmounted by a gas-pipe, D', which terminates at its upper end in a long and very narrow outlet, slot, or mouth *d'*, which is nearly over or in close proximity to the steam-nozzles C. I employ also in this burner a chimney or flue, E, having a flattened transverse section which may be adjusted upward and

downward in the manner above described relatively to the gas and air tubes or nozzles. The steam issuing in currents from the steam-nozzles C will induce a flow of gas upward into the chimney or flue E, and the latter being adjusted to the required height, the proper amount of air will be drawn in at the lower end of the chimney or flue to insure the burning of the mixture at the cap of platinum, which is at the top of the chimney or flue.

I am aware that it is not new to burn a mixture of air and gas to heat to a point of incandescence a platinum cap at the top of a chimney; and I am also aware that vertically-adjustable air deflectors or cones independent of the chimney, have been employed to regulate the quantity of atmospheric air admitted to mingle with the gas and compressed air issuing from the burner-tubes. The adjustment of such air deflectors or cones was not equivalent to the vertical adjustment of my chimney, which has no opening above its lower end, save at the top, because the air could enter at different points above the burner-tubes, and air entering at a high point, as at the upper cone or deflector, might not become mingled thoroughly with the gas before reaching the platinum cap. With my vertically-adjustable chimney all air, be it much or little, must enter at the lower end of the chimney, and hence will become thoroughly mixed with the gas before reaching the top of the chimney.

I am also aware of United States Patent No. 263,581, granted August 29, 1882, to E. B. Requa. This patent shows and describes a platinum strip arranged immediately over a row or line of gas-tubes, and a chimney surrounding both the tubes and platinum and extending above them. This apparatus has no incandescing-cap at the top of the chimney, the chimney is not adjustable vertically, and no means are provided for regulating the quantity of atmospheric air admitted to mingle with the gas. In this patent the chimney is oval in transverse section, but is not flattened in the sense in which I use the term—meaning a chimney but little thicker than the diameter of the gas-tubes.

In the class of burners to which my invention relates it has been usual, in order to obtain a large area of light-giving surface, to enlarge the size of the chimney and its cap; but when this is done the chimney is so large that room is afforded for the gaseous mixture to pass downward at one side of the ascending current and take fire and burn at the bottom of the chimney, which renders the apparatus useless.

I have discovered that by arranging the burner-tubes in line and employing a flattened chimney the area of the cap E' may be increased indefinitely without danger of the apparatus being rendered useless by the gaseous mixture passing downward and burning at the bottom of the chimney.

Inasmuch as all the gas is burned in Requa's

burner at the bottom of the chimney, the necessity of preventing a downward current of the gaseous mixture did not exist, and hence his oval chimney had no function in preventing such a result, and it would not prevent such a result.

The necessity of my discovery did not exist with Requa's burner, as it does in burners which have a chimney surmounted by an incandescing-cap.

I do not desire to include in my invention anything above described as old.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with two or more burner-tubes arranged in line side by side for supplying two or more jets of combined gas and air or steam, of a chimney of flattened transverse section arranged above the burner-tubes, with its longer diameter parallel with the line of tubes and its shorter diameter transverse to the line of tubes, and having a surmounting cap of material which will become incandescent by heat, and supports on

which the chimney is vertically adjustable to regulate the quantity of atmospheric air admitted to mingle with the gas, substantially as herein described.

2. The combination, with the compressed-air chamber A and two or more air-tubes, C, projecting upward therefrom and arranged in line side by side, of the gas-chamber A' and the gas-tubes D, projecting upward therefrom around the air-tubes C, the chimney E, surmounted by a cap, E', of a material which will become incandescent by heat, and having a flattened transverse section the longer diameter of which is parallel with the line of burner-tubes and the shorter diameter of which is transverse thereto, and supports on which the chimney is vertically adjustable to regulate the quantity of atmospheric air admitted to mingle with the gas, substantially as herein described.

JOHN C. ENGLISH.

Witnesses:

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