

(No Model.)

2 Sheets—Sheet 1.

J. JOHNSON.
GAS STOVE.

No. 587,583.

Patented Aug. 3, 1897.

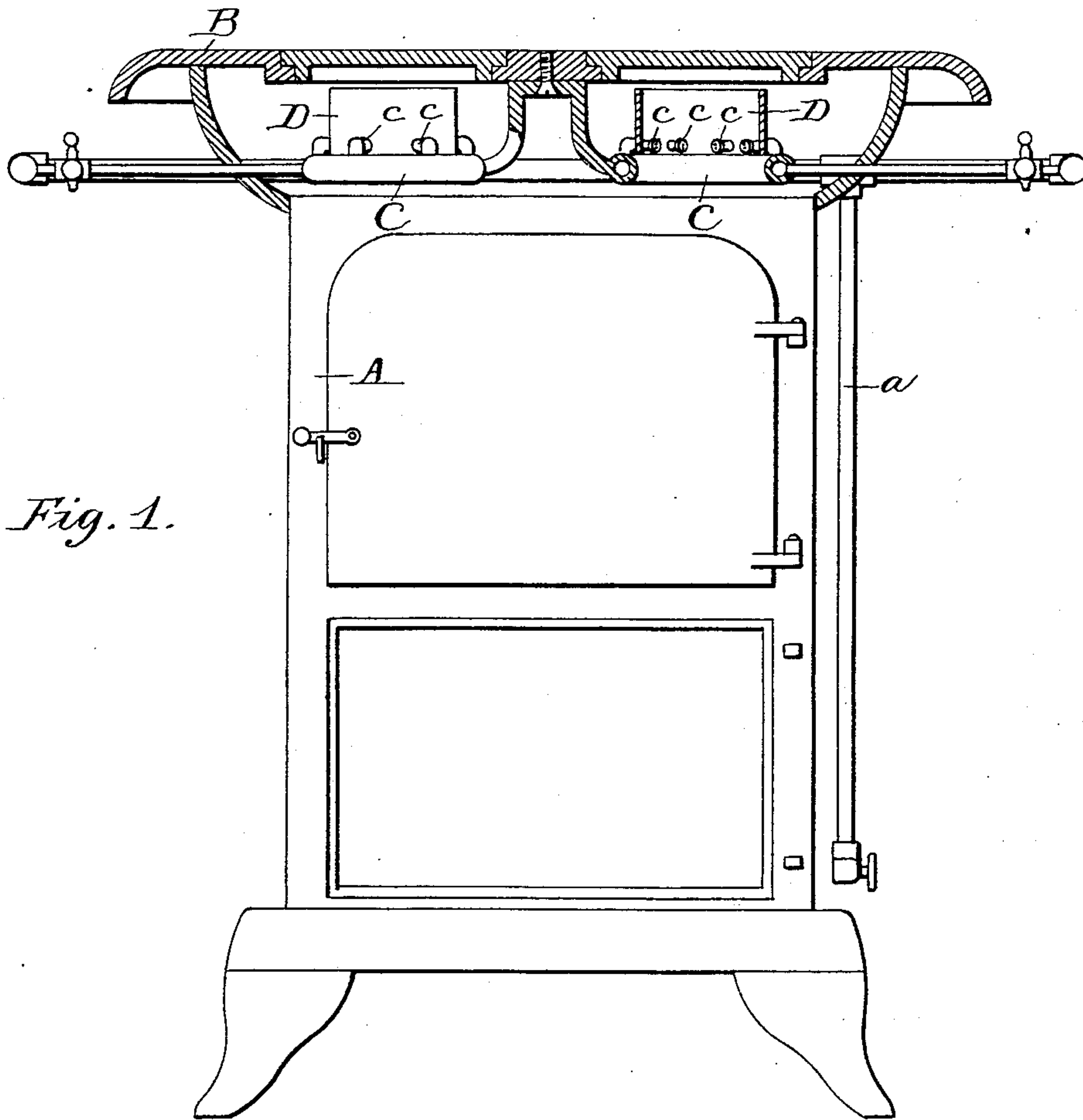


Fig. 1.

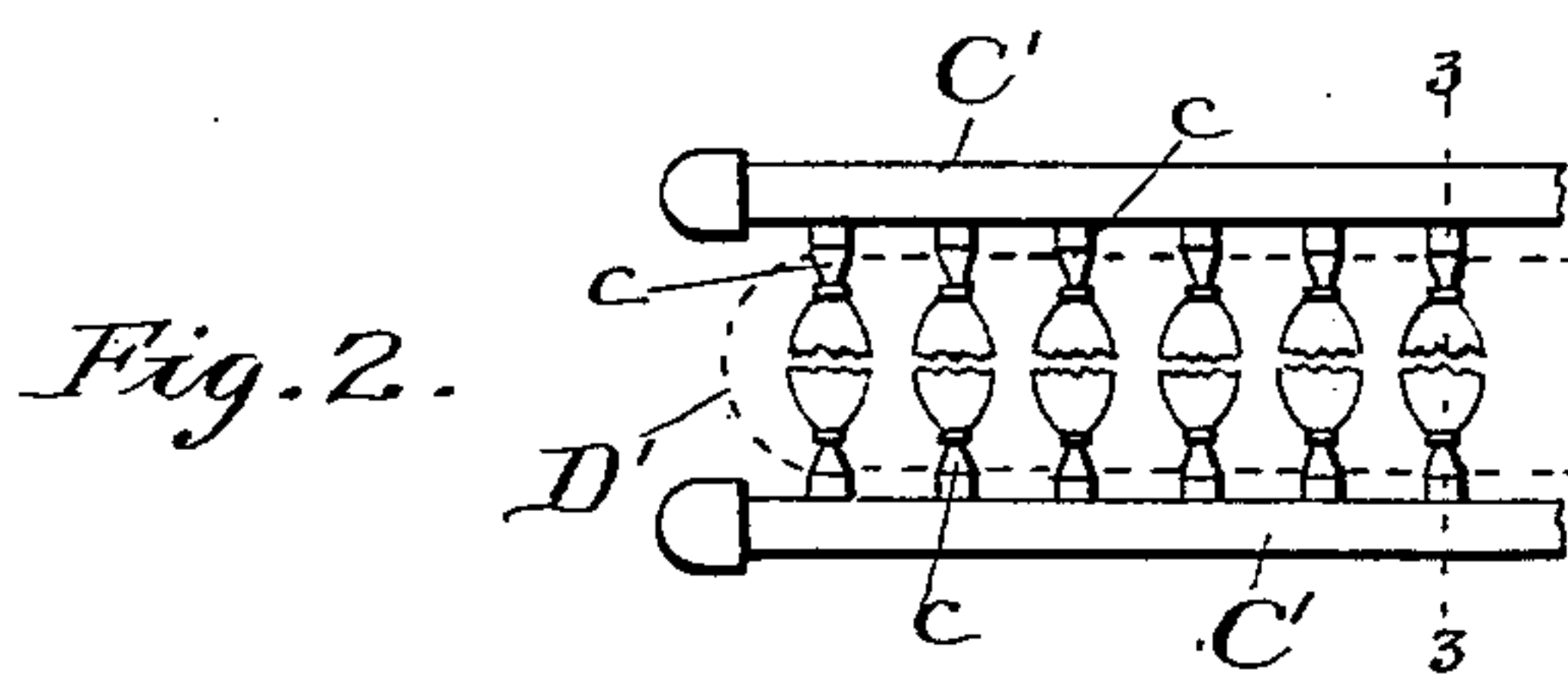


Fig. 2.

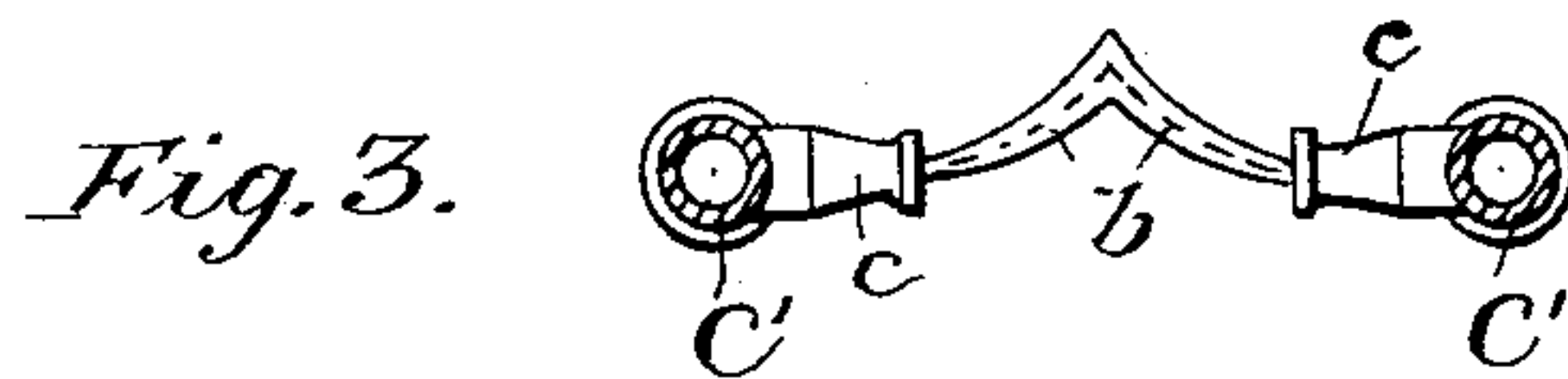


Fig. 3.

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2 Sheets—Sheet 2.

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Fig. 4.

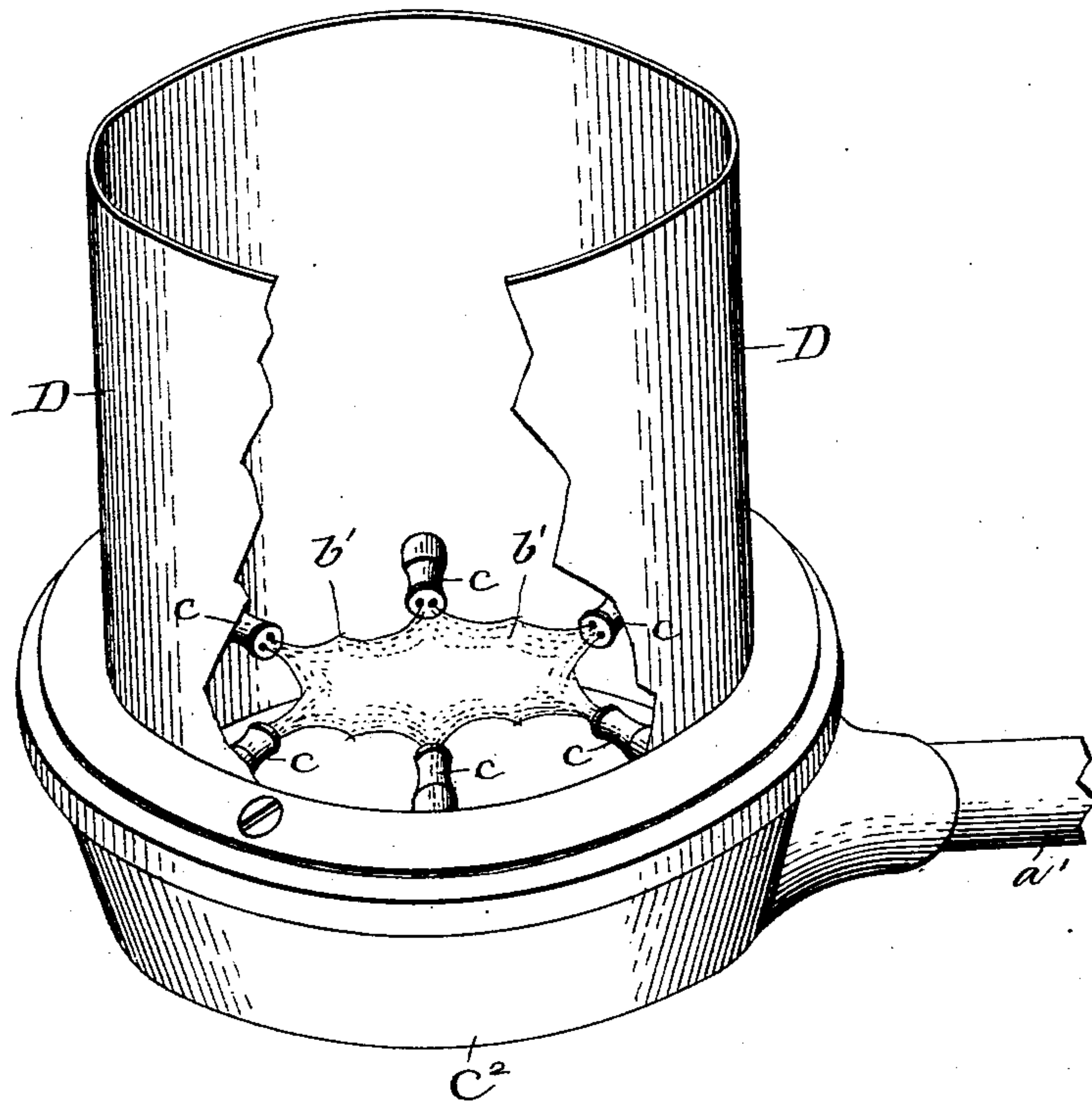


Fig. 5.

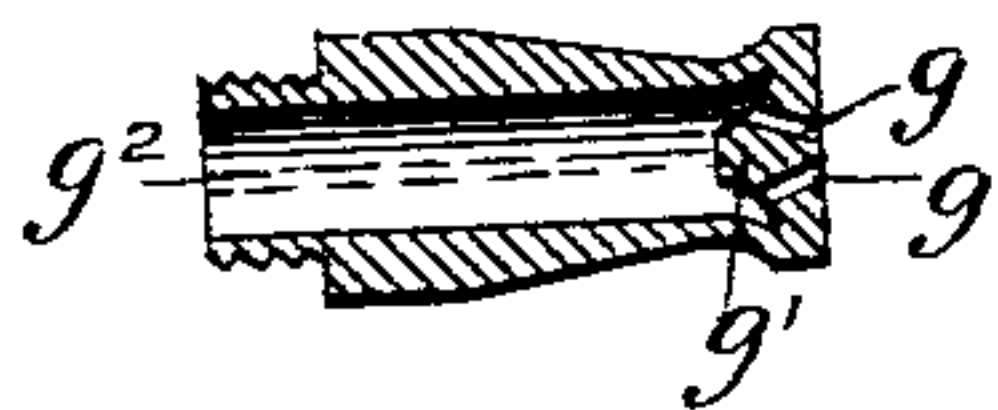
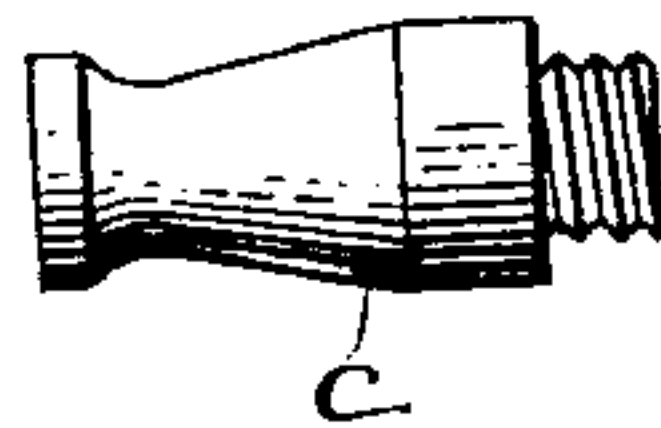


Fig. 6.



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UNITED STATES PATENT OFFICE.

JONATHAN JOHNSON, OF LOWELL, MASSACHUSETTS.

GAS-STOVE.

SPECIFICATION forming part of Letters Patent No. 587,583, dated August 3, 1897.

Application filed December 19, 1896. Serial No. 616,236. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN JOHNSON, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Gas-Stoves; 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.

This invention relates to an improvement in gas-stoves, the object being to provide an improved arrangement of parts whereby the atmospheric air may be more effectually supplied to aid in the combustion of the gas; and the invention therefore consists, essentially, in the construction, arrangement, and combination of parts substantially as will be hereinafter described and claimed.

In the annexed drawings, illustrating my invention, Figure 1 is a sectional side elevation of a gas-stove embodying my present improvements. Fig. 2 is a plan view of two parallel rows of burners constructed and arranged in the manner peculiar to my present invention. Fig. 3 is an enlarged cross-sectional view on the line 3 3 of Fig. 2. Fig. 4 is an enlarged perspective view of that form of the invention represented in Fig. 1, with slight modifications in the situations of the burners. Fig. 5 is a longitudinal section of one of the burners, the same being of the fish-tail type, which is adapted to cause a spreading flame; and Fig. 6 is a side elevation of the burner shown in Fig. 5.

Similar letters of reference designate corresponding parts throughout all the different figures of the drawings.

A designates a gas-stove, the same being presented here simply as one example of heating or cooking device to which my invention may be applied, it being understood that the invention is adapted for use with many different forms of stoves and heating or cooking apparatus. The stove A has the upper lid-provided surface B and suitable gas-supply pipes *a*, which are arranged in any desired manner. Suitably arranged in connection with the top B are the burners *c*. These are placed horizontally in circular rows and are preferably attached to the circular supply-pipes C, as shown in Fig. 1, or they may be

arranged in straight rows by being attached to a straight pipe or pipes C', as shown in Fig. 2, or they may be connected to an annular casing, as shown at C² in Fig. 4, it being essential that there should be a free central space between the converging burners, which is occupied by the horizontal flames issuing from said burners, and which permits of the vertical interior air-current, which passes transversely through the flame and assists in promoting combustion, said current being produced by the coaction with the burners of an air-shaft, as will be hereinafter more fully described.

I will now explain the construction and function of the burners employed in my present improvements.

The type of burner which I preferably use is what is commonly known as a "fish-tail" burner, the same having the function of producing a two-lobed flame that spreads after the manner of the tail of a fish. This particular burner is represented in section in Fig. 5 and in side elevation in Fig. 6 and is clearly shown in perspective in Figs. 1 and 4. The tip of the burner is provided with two gas-outlet orifices *g g*, leading out from the central passage *g*², there being an intermediate or central tip *g'* between the outlet-orifices *g g*, the said orifices *g g* converging toward each other and being oblique to the axial line of the burner, so that the jets of gas issuing therefrom will cross each other and after ignition produce a bilobed spreading flame which will be increased in size in proportion to the pressure of the gas supplied through the central passage *g*² of the burner. The function of this fish-tail burner is therefore to produce a horizontally-spreading flame, and it is to be noted that said flame, although it will increase in size laterally and spread out larger on the sides as the gas-pressure increases, yet will not, however, lengthen proportionally outwardly from the burner. Although the fish-tail type of burner is the one preferably employed by me, yet it is evident that other burners having the same function and calculated to produce the same kind of a flame might be employed instead of it. In using this burner it is my desire to provide means for producing a flame that will spread out into a substantially horizontal

sheet, increasing in size laterally as the pressure of the gas increases. I therefore reserve the privilege of employing such construction of burner as will enable me to accomplish said result.

In combination with the burners *c*, which are arranged in a horizontal position and in a circular series, as shown in Figs. 1 and 4, or in parallel rows, as shown in Fig. 2, I employ a cylinder or shield *D*, (or *D'*, as shown in dotted lines in Fig. 2,) which surmounts and surrounds the burners and is open at top and bottom, as shown, so as to permit a vertical current of air to pass through it and central between the burners from bottom to top at right angles to the spreading flames issuing from the horizontally-arranged fish-tail burners. This cylinder or shield prevents disturbance of the flame by agitation outside of the shield. It also constitutes an air-shaft, by which, in conjunction with the heat of the flames, a strong draft of air is drawn through the flames, which, owing to their flat horizontal arrangement, have the burning products thoroughly exposed to the air, so that a perfect and safe combustion of the gas is insured as the result of the thorough commingling of the gas and air after ignition. All the carbon will be effectually consumed, so that the heat obtained will be without a product of smoke and without any odor. This will likewise provide a positive system of burning hydrocarbon or other gas, in which system there will be no reaction, or, as it is commonly termed, "lighting back," such as sometimes results in burners of the Bunsen type, in which the gas and air are mingled before arriving at the point of ignition. It will thus be seen that the flames issuing from the several burners of the series spread into a wide, flat, substantially horizontal sheet, as shown at *b*, Fig. 3, and at *b'*, Fig. 4, so that a large area of flame is presented for contact with the current of air passing through the air-shaft or shield *D*, and by virtue of this widely-spread flame the air can become more thoroughly and intimately commingled therewith and combustion thereby be promoted.

The shield or cylinder *D* may vary considerably in its precise construction provided it retains conspicuously its primary character of a channel or shaft for the vertical current of air. By the horizontal and converging arrangement of the burners and their orifices the flames issuing therefrom meet and substantially fill the sectional area of the air-shaft, so that all parts of the flames are trav-

ersed by the air-current flowing through the air-shaft.

It will also be noted that the converging flames as they come in close proximity to each other and merge together to a certain extent keep each other warm, so to speak, and prevent the cooling of the edges of the flames, and consequently the combustion is promoted.

From the foregoing specification it will be readily understood that while the flames spread laterally in proportion to the increase of the pressure of the gas they will not be extended outwardly in a direct line from the burner, or, in other words, will not be lengthened in the same proportion, this effect resulting from the peculiar construction of the burners that I employ. Therefore as the burners are arranged opposite to each other the tips of the flames will project toward each other, leaving more or less of a space between said tips. Thus the several flames which go to make up the horizontal sheet which is traversed by the air-shaft are not to be considered as severally overlapping each other, but as occupying positions contiguous to each other, as I have shown and described.

Having now fully described my invention, what I claim is—

1. In a gas-stove, the combination with a series of burners having converging orifices and adapted to produce flames that are horizontal and spread laterally without lengthening in the same proportion, said burners being disposed opposite to each other so that the issuing flames project toward each other, of a shield or air-shaft surrounding said burners and allowing a current of air to pass transversely through the sheet of flame formed as specified, substantially as described.

2. In a gas-stove, the combination with a circular series of burners having converging orifices and adapted to produce flames that are horizontal and that spread laterally without lengthening in the same proportion, said burners occupying radial positions opposite each other and extending their flames toward each other, of a shield or air-shaft surrounding said burners and allowing a current of air to pass transversely through the sheet of flame, substantially as described.

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

JONATHAN JOHNSON.

Witnesses:

J. FRED. KELLEY,
FRED E. TASKER.