

No. 607,541.

Patented July 19, 1898.

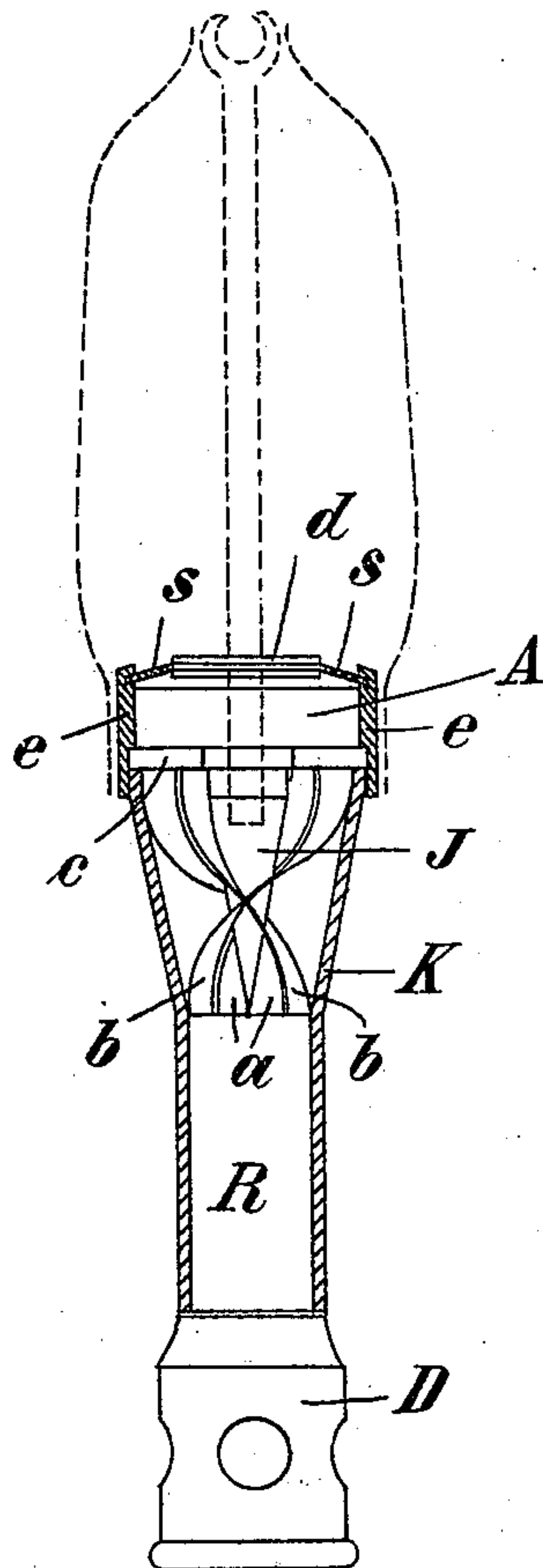
E. HERZ.
HEAT GENERATING GAS BURNER.

(Application filed Apr. 28, 1896.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses.

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Inventor
E. Herz
by his attorney
Dr. J. Schanz

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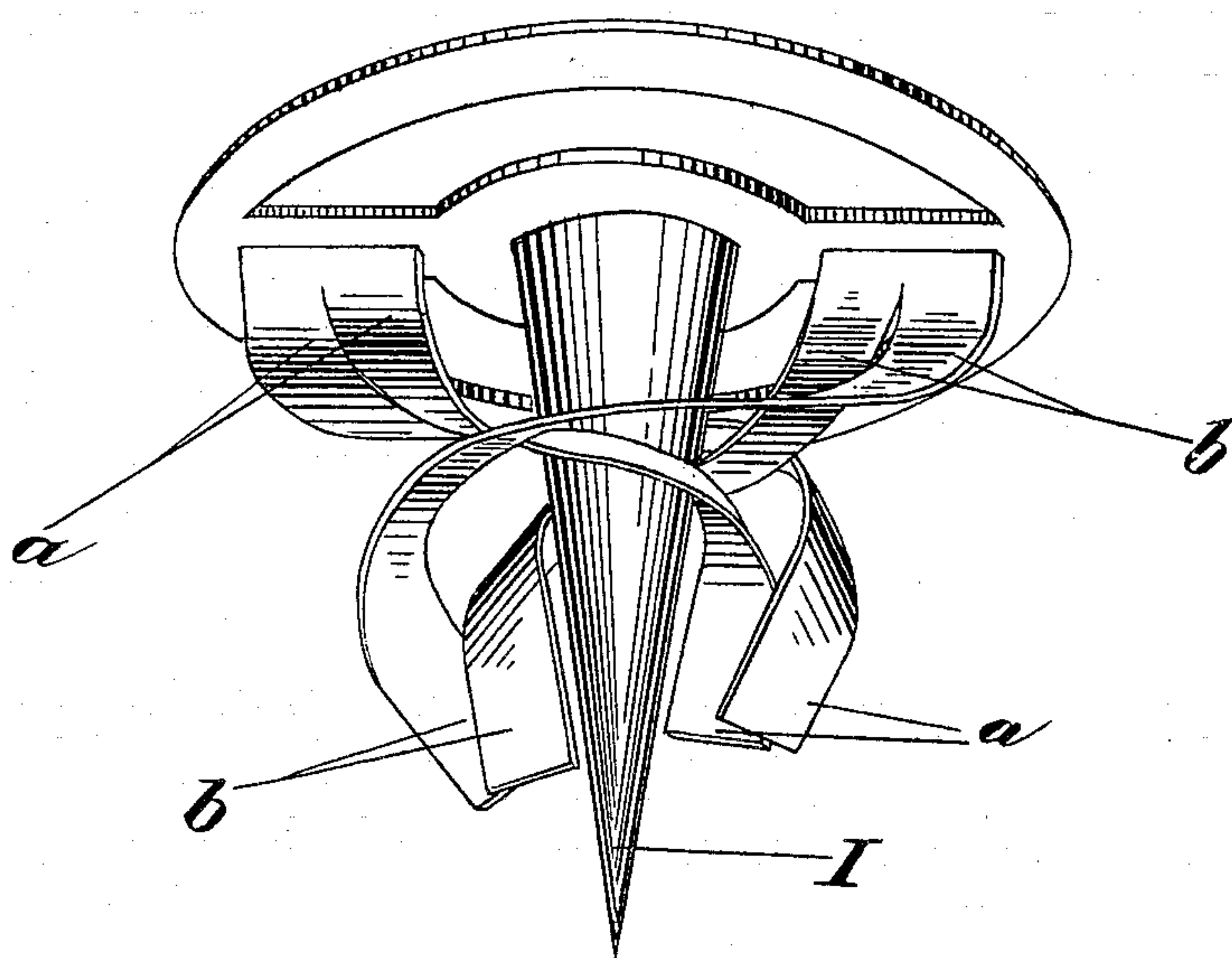
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(Application filed Apr. 28, 1896.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 2



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UNITED STATES PATENT OFFICE.

EMANUEL HERZ, OF BERLIN, GERMANY.

HEAT-GENERATING GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 607,541, dated July 19, 1898.

Application filed April 28, 1896. Serial No. 589,416. (No model.) Patented in Germany March 5, 1896, No. 90,214.

To all whom it may concern:

Be it known that I, EMANUEL HERZ, engineer, of 43 Wilhelmstrasse, Berlin, in the Kingdom of Prussia, German Empire, have
5 invented new and useful Improvements in Heat-Generating Gas-Burners, (for which I have obtained German Patent No. 90,214, dated March 5, 1896,) of which the following is a specification.

10 The present invention relates to a heat-generating gas-burner which is further highly suitable for incandescent lighting. It is claimed for this kind of burner that it develops a steady smokeless flame with an extended
15 superficial area and a very high temperature. The following considerations, perfectly novel in their character, but at the same time justified by the successful results achieved, have led me to the construction of this burner: It
20 is only possible to obtain a steady flame where the same volume of gas and air is regularly mixed together and burned at every point of the burner-orifice. Under such conditions it is then possible to vary the relative proportion considerably and according to the purpose in view to choose one by which the gas
25 is burned to the fullest extent and the highest temperature attained. The result is that the gas escaping from the nozzle carries with
30 it an unvarying quantity of air and conveys it to the head of the burner independent of the resulting generation of heat. Even in the case, however, of the gas-escaping openings being adjusted as accurately as possible
35 the penetrating mixture of gas and air will not be uniform in its nature. On the contrary, its quality will vary in every cross-section perpendicular to the burning axis, as particles showing a proper proportion of gas
40 and air will alternate with those having excess and deficient quantities. With the first named the gas consumption is insufficient, while the last named give rise to explosions and in consequence to the unpleasant whirring and crackling-like sound of the common
45 Bunsen flame. It is therefore necessary to construct a contrivance which shall insure the homogeneousness of the mixture.

In the accompanying drawings, Figure 1
50 shows a section of my improved heat-generating gas-burner. Fig. 2 is a perspective

view, on an enlarged scale, of the two pairs of spirals shown in Fig. 1.

The gas escaping out of the nozzle catches up the air in the well-known manner in the
55 suction-chamber D, the air passing along the tube R at the same rate as the gas. The mixture becomes heated, and to make allowance for this heating and the consequent expansion of the gas the tube must be enlarged corresponding to the increase in volume. To
60 this end the adjoining mixing part K is constructed conically. In enlarging the space allowance must be made for the introduction of the cone J, suspended from the cross-piece
65 c. The head A is also cylindrical by virtue of the cylinder e, which passes through without any variation in its straight form.

The cone forms a ring-shaped passage. The burner-head A is perfectly free inside. Its
70 cross-section, however, is suddenly increased at the exit of the cone K. In this way the mixture entering below in R passes unfaillingly to the head A, covered with the mantle
75 s and provided with a flame-divider d. In order, however, to effect a uniformity in the mixture, a mixing contrivance is inserted in the cone K—i. e., the part which would act
80 counter to the mixture. Such a contrivance must not by any means choke up the burner or retain the dust particles; but in cases of necessity it should be possible to clean it by blowing into it.

In the part K are two pairs of stationary spirals a and b, which are pushed concentrically one into the other and of which the
85 inner pair is wound to the left and the outer pair to the right, or vice versa. By this means the inner ascending stratum charged with a surplus of gas must necessarily take
90 a turn to the left and the external stratum charged with a surplus of air a turn to the right. Therefore several strata turning around the cone I are formed, the axes of which strata lie between I and K. For this
95 reason an energetic mixture of the external stratum charged with a surplus of air and of the internal stratum charged with a surplus of gas will be insured. It is thus evident that the gas and the air will be whirled together by such a process.
100

The gas and air particles circulating around

the spirals pass thence into the space A, suddenly enlarged, where, as is natural, their ascending force is retarded. Hence the rotation in a horizontal direction, so as to allow
5 of a complete mixing of the particles.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

10 1. A mixing apparatus for gas-burners, consisting of stationary spirals arranged concentrically one in the other, and having an ascending direction opposite to each other, substantially as set forth.

15 2. In gas-burners the combination of a conical mixing-chamber, with a cone centrally fixed in this chamber, and stationary spirals wound concentrically around the cone in a direction opposite to each other, substantially as and for the purpose specified.

20 3. In a gas-burner the combination of a conical mixing-chamber, with a cone cen-

trally fixed in the said chamber, and two pairs of stationary spirals arranged concentrically the one in the other, one pair being wound around the cone in a direction opposite to that of the other pair, substantially as
25 and for the purpose set forth.

4. In a gas-burner the combination of a conical mixing-chamber, with a cone centrally fixed in this chamber, stationary spirals
30 wound concentrically to each other around the cone in a direction opposite to each other, and a cylinder forming the head of the conical mixing-chamber, substantially as and for the purpose described. 35

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

EMANUEL HERZ.

Witnesses:

W. HAUPT,
HENRY HASPER.