

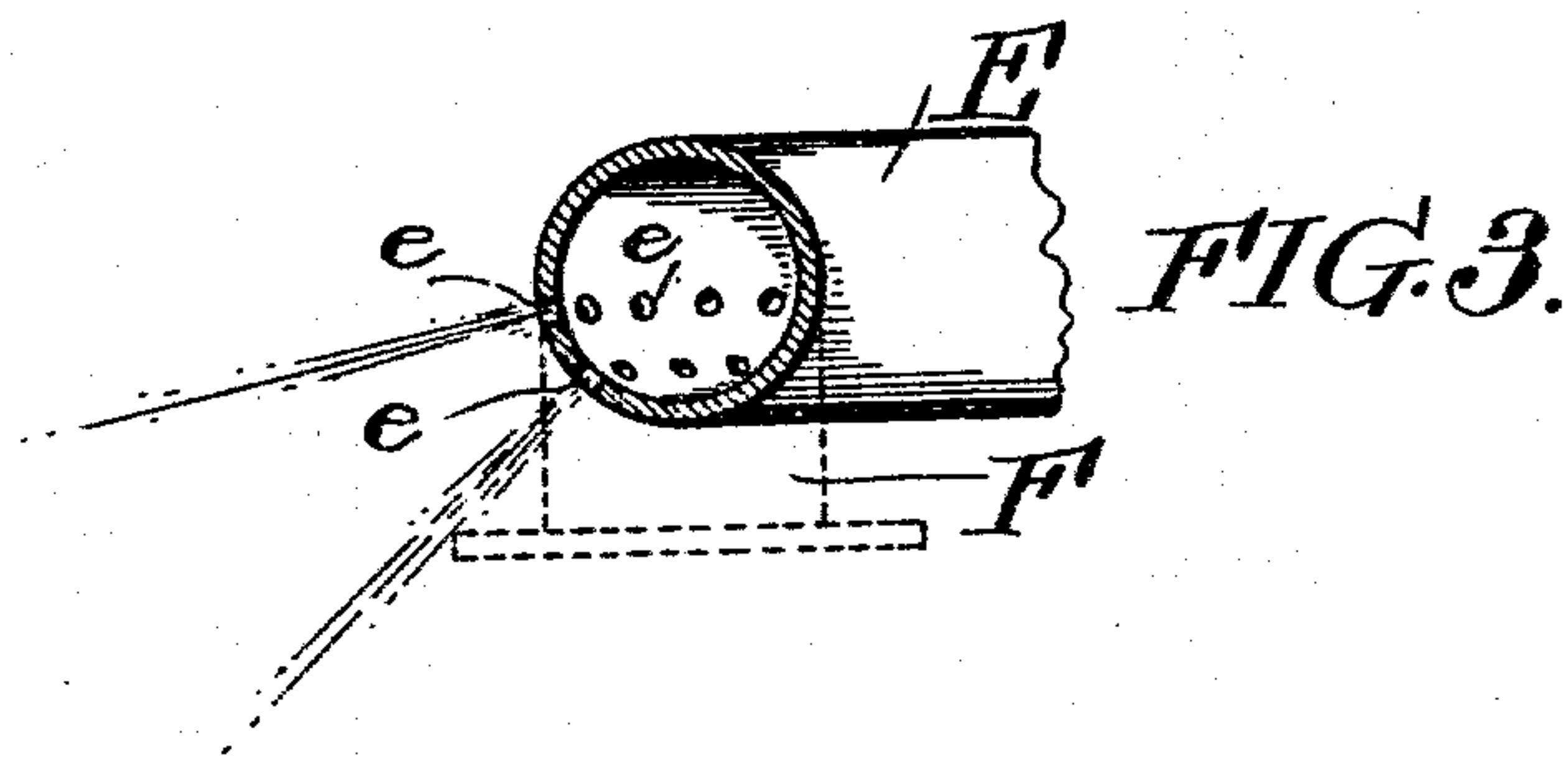
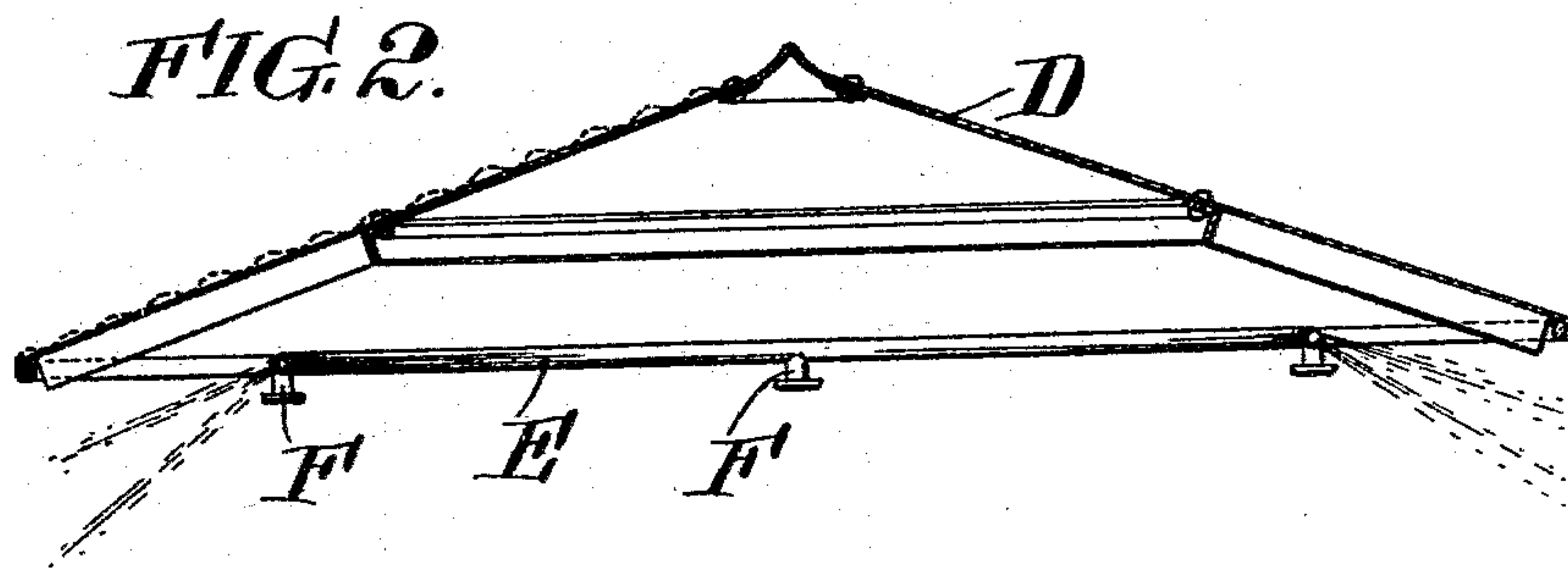
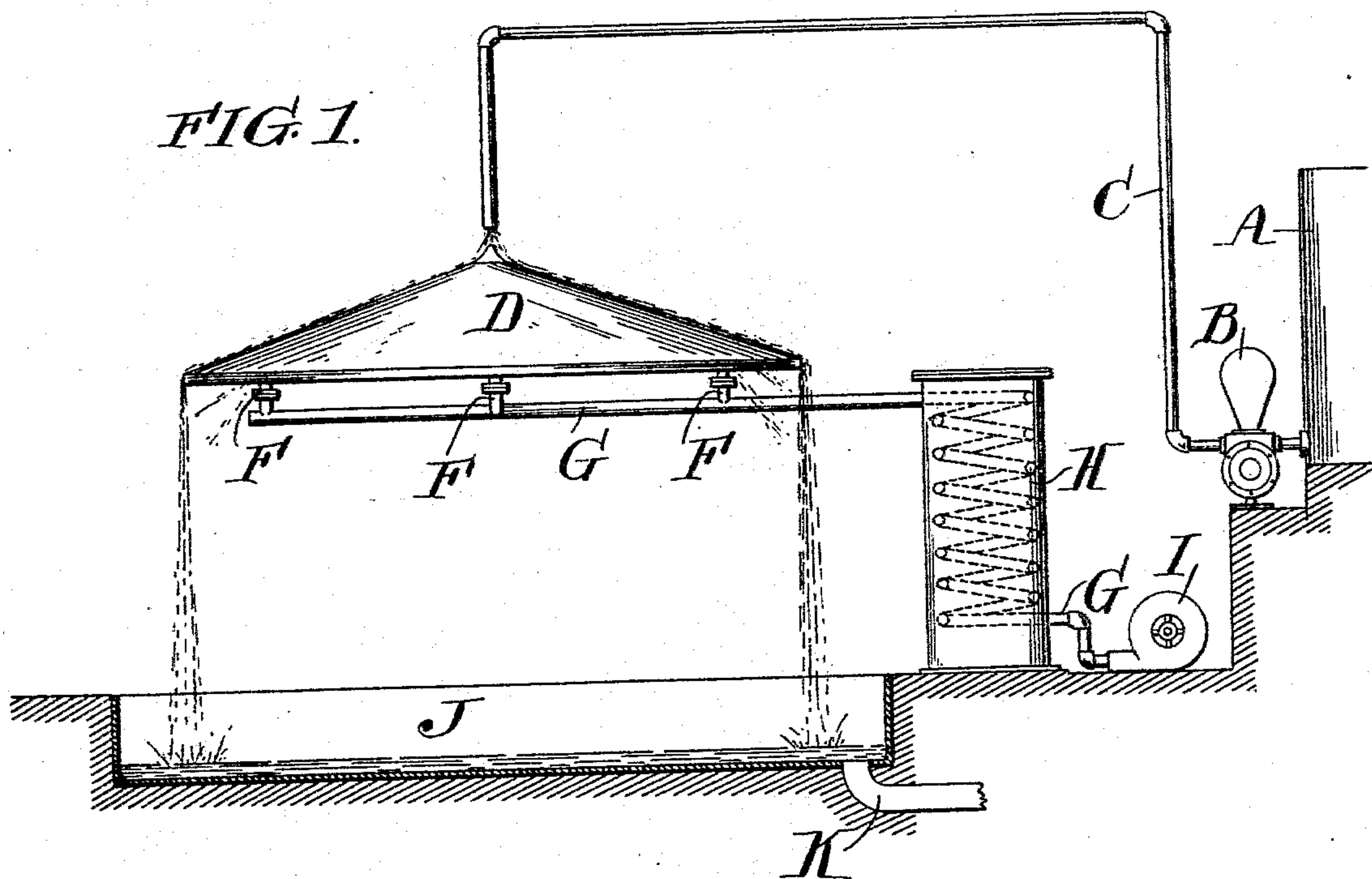
(No Model.)

P. HILDENBRAND.

APPARATUS FOR COOLING AND AERATING LIQUORS.

No. 515,829

Patented Mar. 6, 1894.



WITNESSES:

Henry D. Dwyer
C. H. Dutcher

INVENTOR:

Philip Hildenbrand
By *[Signature]*
[Signature]

UNITED STATES PATENT OFFICE.

PHILIPP HILDENBRAND, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR COOLING AND AERATING LIQUORS.

SPECIFICATION forming part of Letters Patent No. 515,829, dated March 6, 1894.

Application filed November 21, 1892. Serial No. 452,846. (No model.)

To all whom it may concern:

Be it known that I, PHILIPP HILDENBRAND, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Apparatus for Cooling and Aerating Liquors, of which the following is a specification.

My invention relates to apparatus for cooling and aerating beers and other liquors, and consists of certain improvements which are fully set forth in the following specification and are shown in the accompanying drawings.

It is the object of my invention to provide an efficient and economical apparatus for cooling beers and other heated liquors.

It is also an object of my invention to accomplish a greater or less degree of aeration of the liquor while it is being cooled. If desired the apparatus may be employed for the purpose of cooling only in cases where aeration is unnecessary; or for aerating only where cooling is not required.

My invention is especially suited for cooling and aerating beer during the process of its manufacture, and in describing the invention I shall more particularly refer to the use of the apparatus for this purpose. It is to be understood, however, that the invention may be employed for cooling or aerating other liquors.

It is very desirable in the brewing of lager beer that the beer shall be more or less aerated during the process of cooling.

In carrying out my invention, I cause the liquors to be cooled or aerated, to flow over an extended surface in a thin film and thence to fall in drops, or in a finely divided condition into a receiving tank or vessel and I introduce into the liquor as it thus falls in a shower or spray, blasts of air or gas. These air or gas blasts introduced into the shower, aid greatly in cooling the liquid and at the same time charge it to a greater or less extent.

I shall now refer to the drawings for the purpose of more particularly describing my improved apparatus.

Figure 1 is a side elevation of my improved apparatus for cooling and aerating liquors with the cool ship or receiving tank in transverse vertical section. Fig. 2 is a transverse vertical sectional view of the diaphragm over which the liquor flows; and Fig. 3 is a verti-

cal sectional view on an enlarged scale of the pipe for supplying the blasts of air or gas to the liquor as it falls from the diaphragm. 55

A is a liquor vat or reservoir which contains the liquor to be aerated or cooled.

B is a pump connected with the reservoir or vat for pumping the liquor therefrom.

C is a pipe for conducting the liquor from the pump B to the diaphragm D. The diaphragm D is of considerably extended area with a slightly inclined upper surface and is located under the opening of the pipe C so that the liquor emerging from the pipe will flow over the surface of the diaphragm in a thin film and drop off the edge in a finely divided shower. I have shown the diaphragm of a conical shape with the pipe C opening at the apex of the cone. This construction, it is apparent affords the greatest surface. With the diaphragm of this shape the liquor falls from the circular edge in a shower, as is indicated in Fig. 1. 60 65 70

The liquor in passing over the surface of the diaphragm D in a thin film becomes more or less cooled. The diaphragm may be kept cool if desired in any convenient manner, as by blowing a blast of cold air upon it. 75

The diaphragm D may be provided with a corrugated surface, as is shown in dotted lines in Fig. 2, so as to increase the area over which the liquor flows before it drops off. 80

E is a pipe located adjacent to the edge of the diaphragm, preferably within the edge, provided with apertures *e*, through which a blast of air or gas is blown upon the shower of liquor as it falls from the edge of the diaphragm. 85

I prefer to dispose the apertures *e* in the pipe E so that the blasts of air will emerge therefrom at two or more points, striking the shower at different points as it falls from the diaphragm. This is clearly shown in Fig. 3. The particular construction of the pipe E is however immaterial to the invention, and may be varied to suit the character of the particular diaphragm employed. 90 95

In the drawings I have shown an annular pipe E located below the diaphragm D, so as to be upon the inner side of the shower of liquor, and connected by couplings F with a main G by which the air or gas is supplied to the pipe E. For the purpose of cooling the 100

air or gas the main G may be passed through a refrigerator H. The air may be forced by a pump or blower I connected with the main G. It is apparent, also, that the pump B for
5 drawing the liquor from the vat or reservoir A and forcing it through the pipe C may be omitted, if the reservoir be at an elevation, so that the liquor may flow by gravity.

J is the cool ship or receiver located beneath
10 the diaphragm to receive the liquor as it falls. The cool ship or receiver is preferably located some distance below the diaphragm D, so that the liquor may fall for some distance through the air and may become cooled thereby. The
15 cooled or aerated liquor from the cool ship J may be conducted off through an outlet K to the receiving tank.

In employing the apparatus for the purpose of cooling or aerating liquors, the liquor flows
20 from the pipe C upon the diaphragm D and passes over the extended surface of the diaphragm, dropping off in the form of a shower from the edge of the diaphragm. Into the falling spray the air or gas blasts are blown
25 from the pipe E. The liquor is cooled partly by passing over the extended surface of the

diaphragm, partly by falling in the form of a shower through the air and partly by the cold blasts blown upon it from the pipe E.

In some cases the blasts from the pipe E may be omitted. The aeration of the liquor is accomplished partly by the passage of the liquor in a shower through the air and partly by the introduction into the shower of the air or gas blasts.

The details of construction shown may be modified without departing from the invention.

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

In an apparatus for cooling and aerating liquors, the combination of the conical diaphragm D, the liquor supply pipe C opening at the apex of the diaphragm D, and the annular blast pipe E located below the diaphragm D and adjacent to the edge thereof.

In testimony of which invention I have hereunto set my hand.

PHILIPP HILDENBRAND.

Witnesses:

ERNEST HOWARD HUNTER,
H. L. MOTHERWELL.