

No. 750,962.

PATENTED FEB. 2, 1904.

W. E. GIBBS.
HYDROCARBON BURNER.
APPLICATION FILED MAR. 17, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1

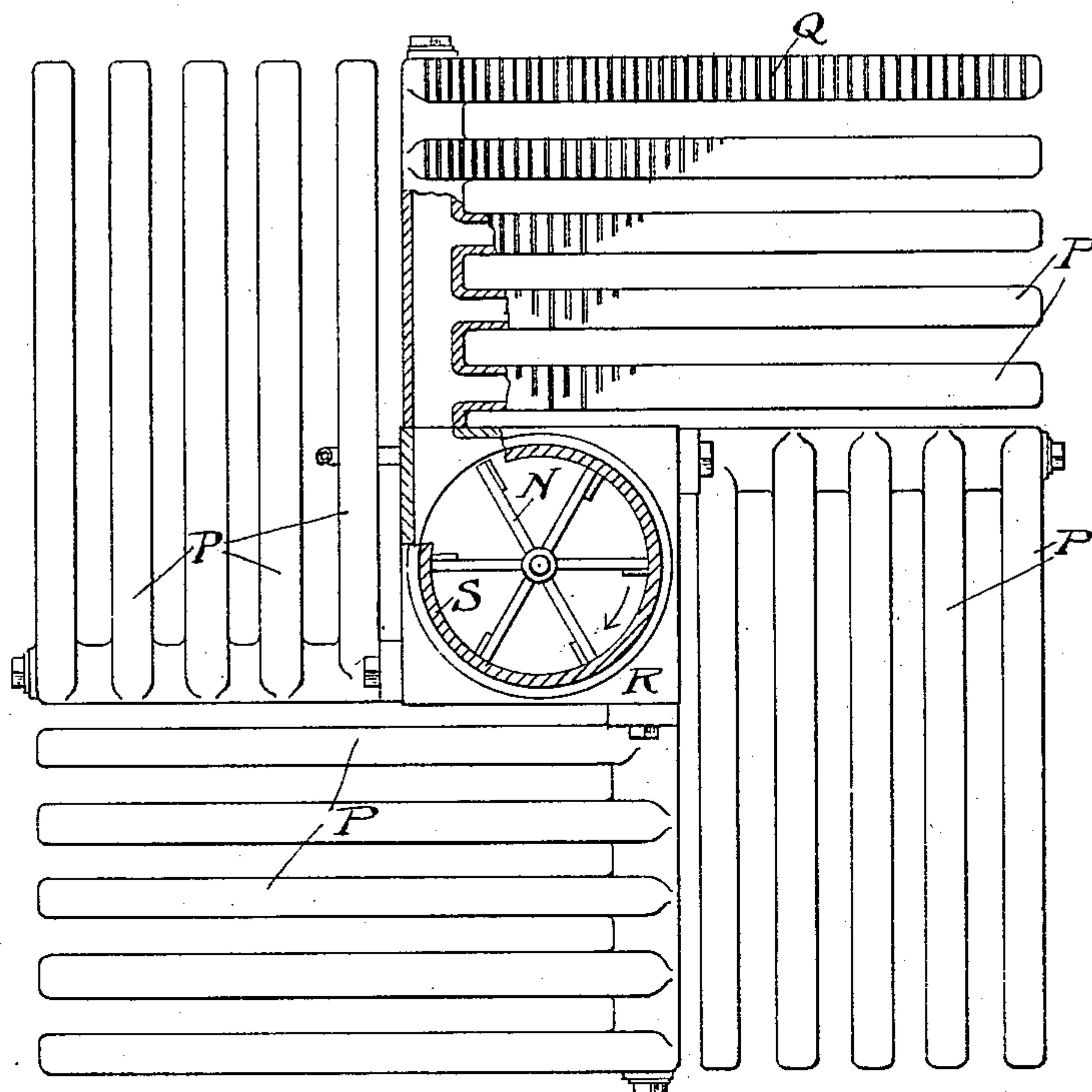
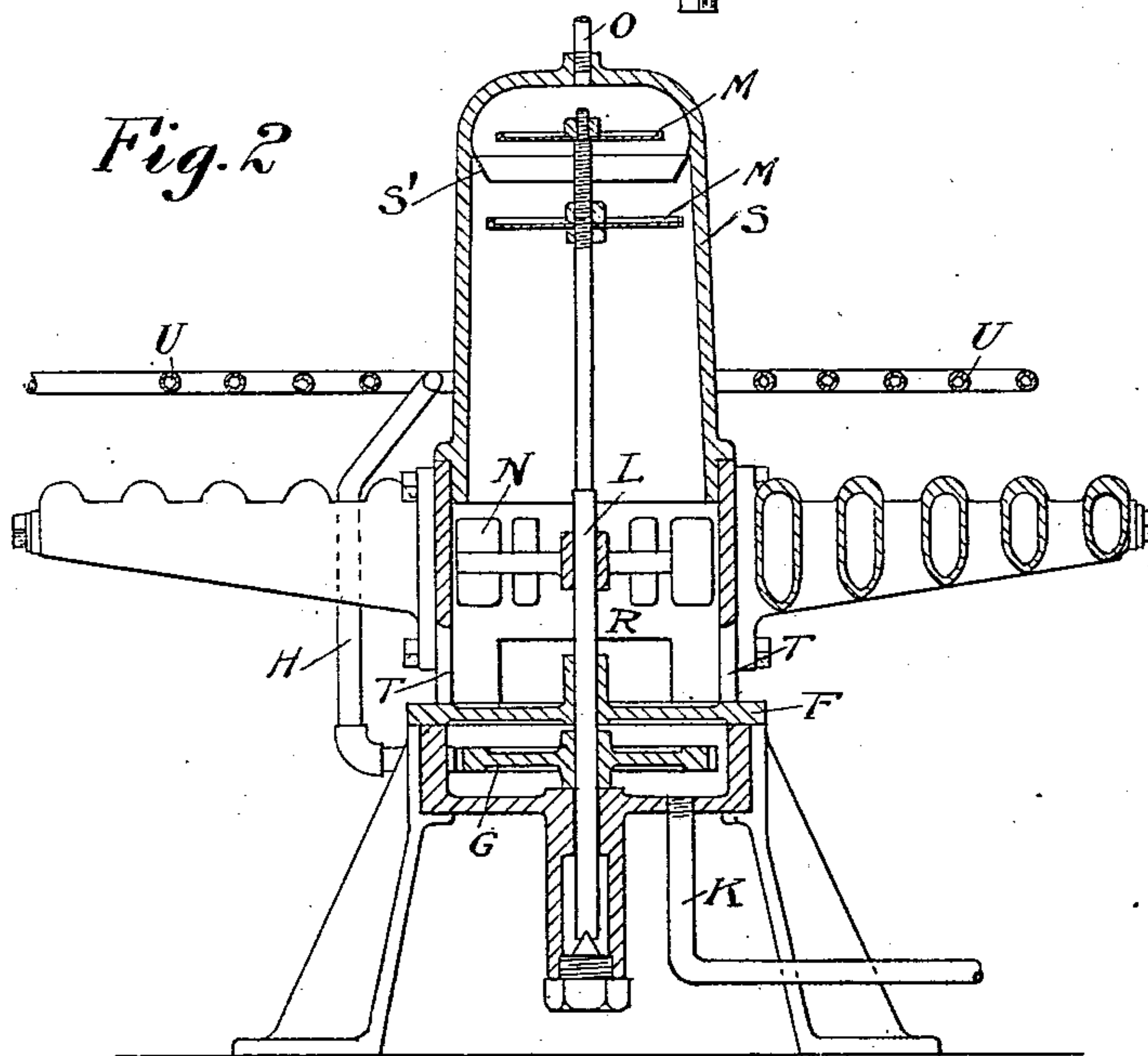


Fig. 2



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2 SHEETS—SHEET 2.

Fig. 3

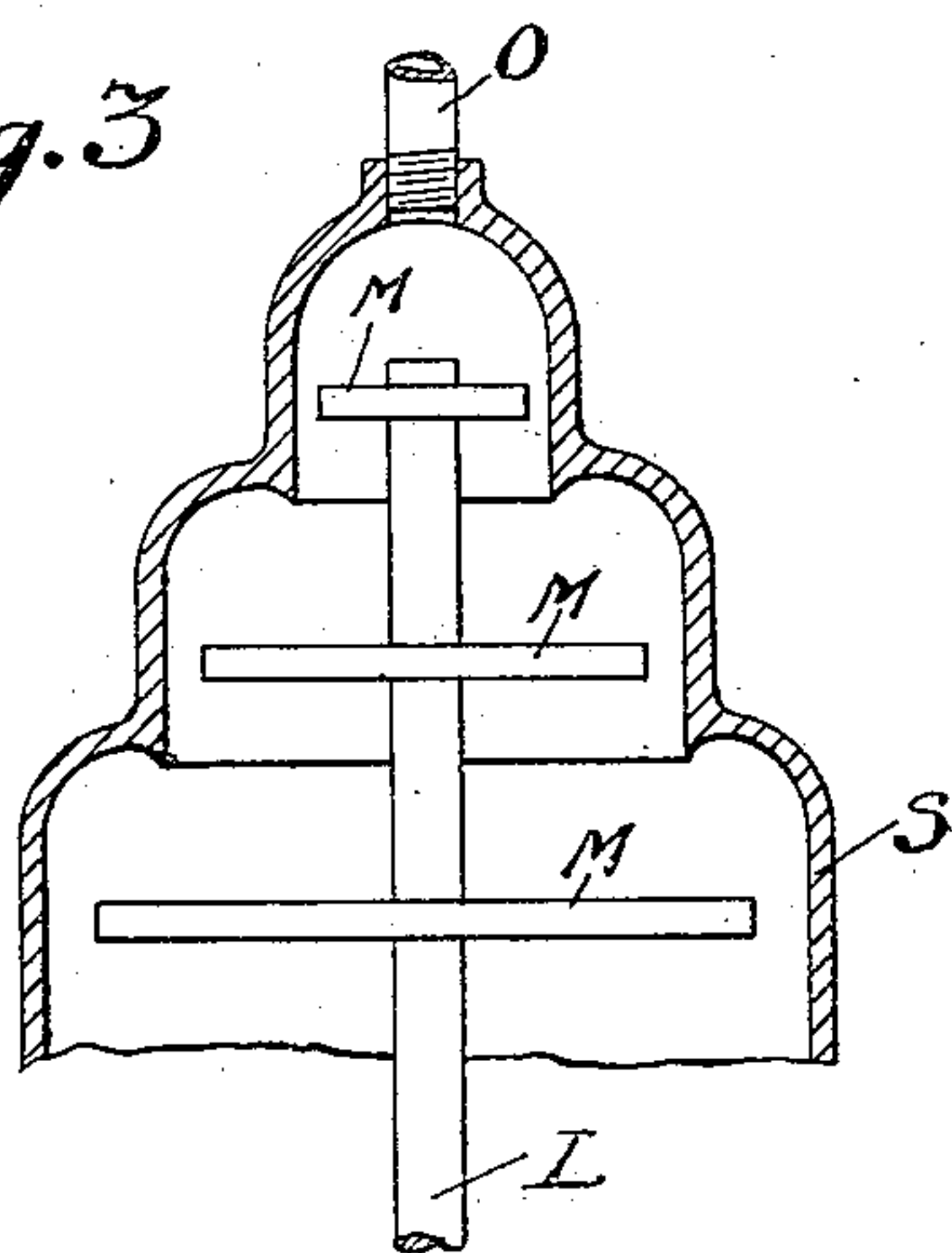


Fig. 4

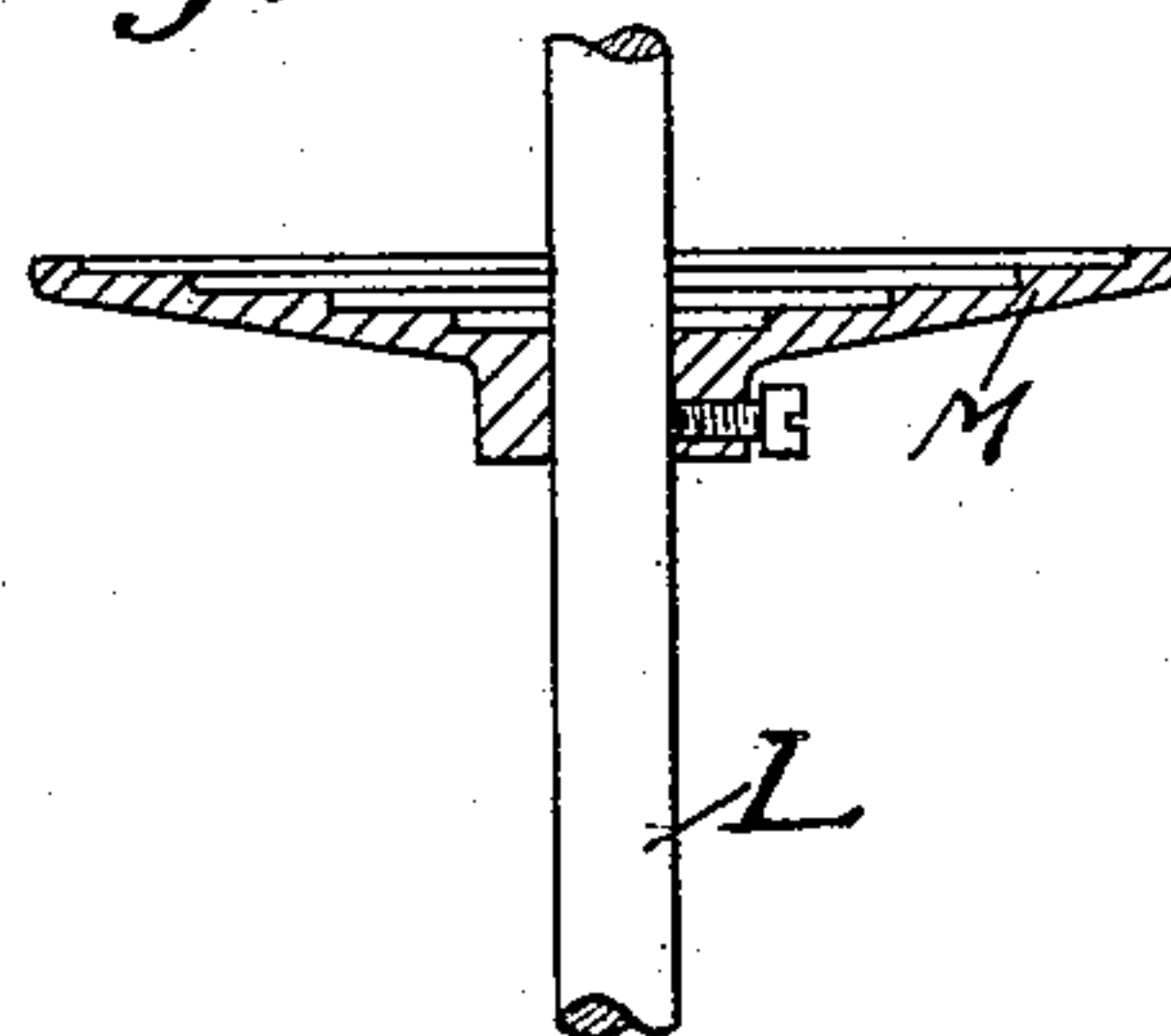
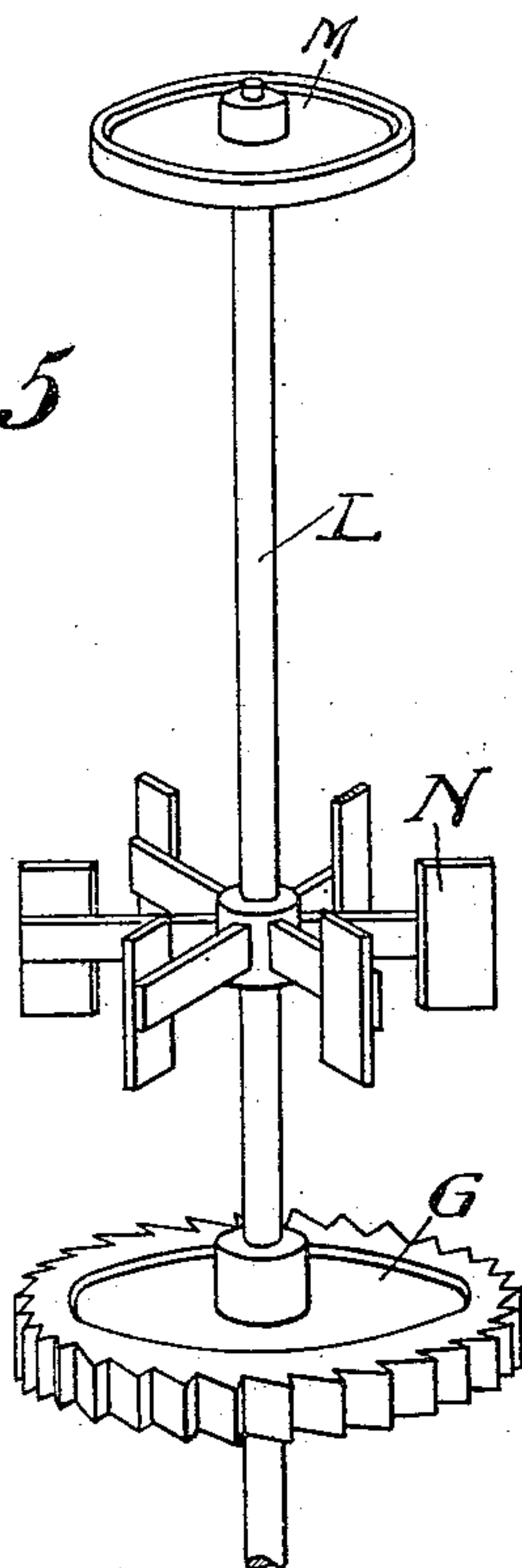


Fig. 5



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HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 750,962, dated February 2, 1904.

Application filed March 17, 1903. Serial No. 148,171. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. GIBBS, a citizen of the United States, residing at Fanwood, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

The hydrocarbon-burner the subject of my present application is distinguished from those burners intended for extremely-rapid generation of steam in large powers and characterized not so much by the economy of their use of the heat units in the hydrocarbon as by their capacity to burn the hydrocarbon with immense rapidity and in large quantities with a flame of correspondingly great volume.

My present invention has for its object the production of a burner adapted for the most economical use of the heat units of the fuel, and is particularly intended for use in furnaces—such, for instance, as domestic furnaces or those on small steam plants in which an air-compressor is not conveniently accessible. I have found that the use of steam for directly spraying or injecting the hydrocarbon vapor is not capable of use in such cases, the flame being insufficiently regular and not subject to sufficient range of regulation. For spraying and mixing the hydrocarbon it is essential that a blast of air be employed and that means be also provided for feeding the mixed air and diffused hydrocarbon over a wide area of the bottom of the fire-chamber and supplying thereto independently of the spraying air-blast sufficient air to support combustion.

In the accompanying drawings I have shown my improved burner, Figure 1 showing the same in plan view with the vaporizing and mixing chamber in horizontal section; Fig. 2, a vertical sectional view of the burner; Fig. 3, a vertical sectional view of a modified form of the upper part of the vaporizing-chamber and spraying-disks; Fig. 4, a sectional view of a modified form of spraying-disk, and Fig. 5 a perspective view of the spraying and mixing devices.

In said drawings, G is a turbine placed in a turbine-box F, and above this box is placed a rectangular box R, open at the top and bottom, from the corners of which extend a series of hollow burner bars or tubes P, having slots Q (indicated on some of the bars) through their upper walls. An inverted pot S fits upon the top of box R and opens thereinto. The turbine-shaft L is carried up nearly to the top of said pot S and has upon its upper end one or more spraying-disks M, to which oil is fed through the pipe O. When more than one disk M is used, the top of the pot is shaped as shown in Fig. 3, by which expedient any oil which fails to be vaporized by the first disk drains into the one below it and thence to another, if necessary. In place of construction shown in Fig. 3 deflectors, such as shown at S' in Fig. 2, may be inserted in the pot S. A plurality of disks is advisable when burning a heavy oil which is difficult to spray or evaporate. Upon the turbine-shaft and in the box R is a fan N, which draws air through the openings T T and discharges it into the burner-tubes P. Oil-vapor, made partly by the spraying-disks and partly by evaporation from the walls of the pot S, descends to the fan N, where it is mixed in the proper proportion with the air entering the burner-arms. Thence the mixture issues from the slots Q and burns as a Bunsen flame. The coil U is a steam-generator. Water under pressure enters its outer end from a suitable source, and steam from its inner convolution is led by pipe H to actuate the turbine G. The turbine-exhaust is indicated at K.

Fig. 4 shows a spraying disk divided into concentric steps. Oil is fed to the central portion of the disk. With some oils a better spray is obtained by this construction. In general a spraying-disk having a slightly-raised edge gives the best results and the finest spray. Such a disk is shown in Fig. 5 in conjunction with the fan and turbine. The preferable speed for a disk having a diameter of eight inches is about twenty-five hundred revolutions per minute. This gives a tangential speed to the oil of nearly a mile a min-

ute, which serves to break the oil into a fine spray and also to drive the particles into violent contact with the surrounding walls.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a hydrocarbon-burner, the combination of a common distributing-chamber, of burner-tubes surrounding and adapted to heat said chamber, of means for supplying air and hydrocarbon spray or vapor to said chamber, a fan located in said chamber, and means independent of the air-supply for driving said fan at high velocity, substantially as set forth.

2. In a hydrocarbon-burner, the combination of a common distributing-chamber, of burner-tubes surrounding and adapted to heat said chamber, of means for supplying air and hydrocarbon spray or vapor to said chamber, a fan located in said chamber, and means for driving said fan at high velocity, substantially as set forth.

3. In a hydrocarbon-burner, the combination of burner-tubes having a common distributing-chamber, a spraying or vaporizing chamber connected thereto, spraying disk or disks in said spraying or vaporizing chamber, a fan in said distributing-chamber, air-sup-

plying means and means independent of the air-supply for driving said disk or disks and fan at high velocity, substantially as set forth.

4. In a hydrocarbon-burner, the combination of burner-tubes having a common distributing-chamber, a fan therein, a spraying or vaporizing chamber connected to said distributing-chamber, spraying disk or disks in said spraying or vaporizing chamber, a turbine connected to said disk or disks and fan and means for leading driving fluid to said turbine, substantially as set forth.

5. In a hydrocarbon-burner, the combination of burner-arms having a common distributing-chamber, an air-propelling fan in said chamber, a spraying or vaporizing chamber connected to said distributing-chamber, spraying disk or disks in said spraying or distributing chamber, a driving-turbine having operating connection with said disk or disks and fan, a steam-heating coil arranged to be heated by said burner and means for leading steam therefrom to said turbine, substantially as set forth.

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Witnesses:

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