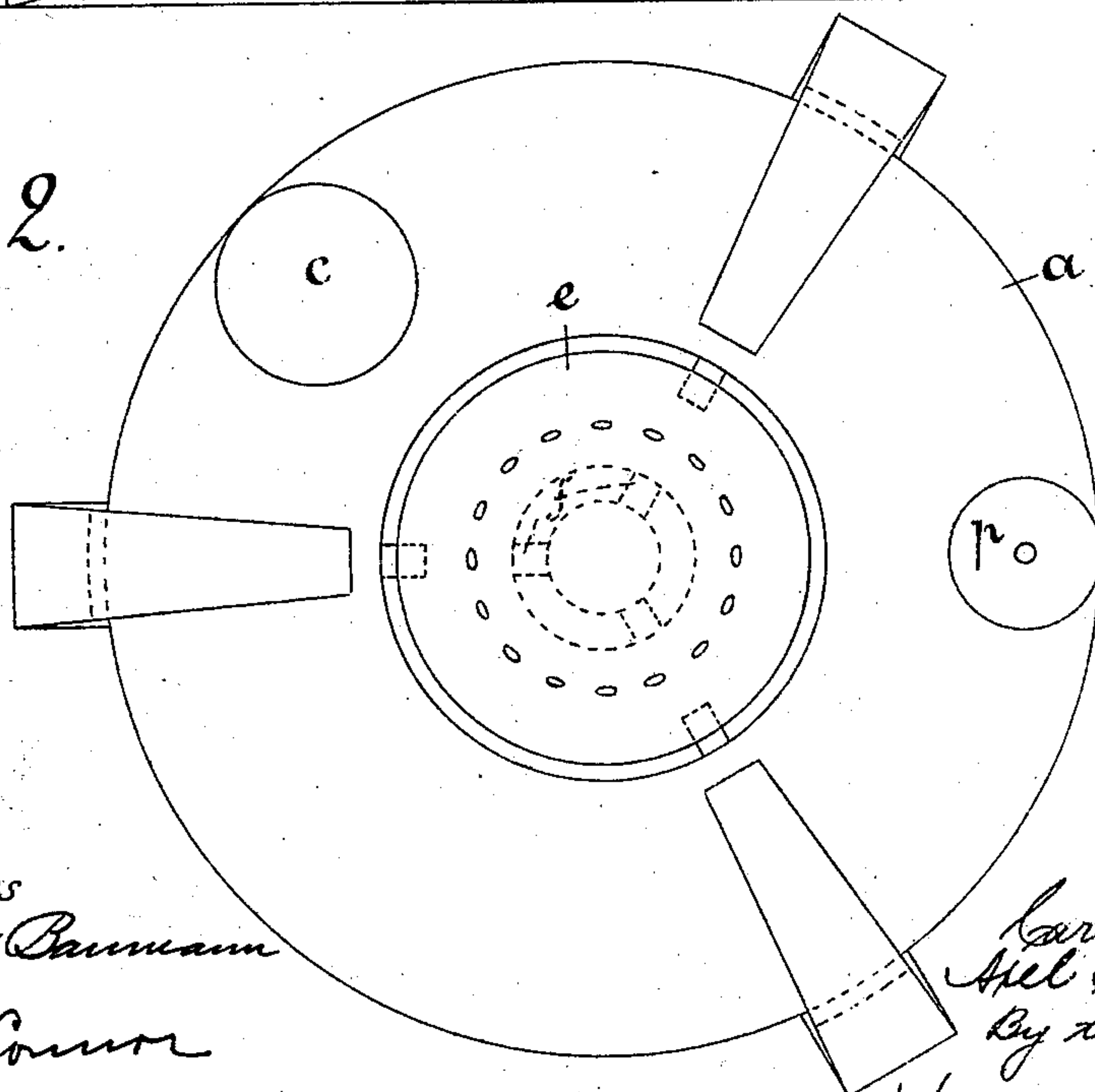
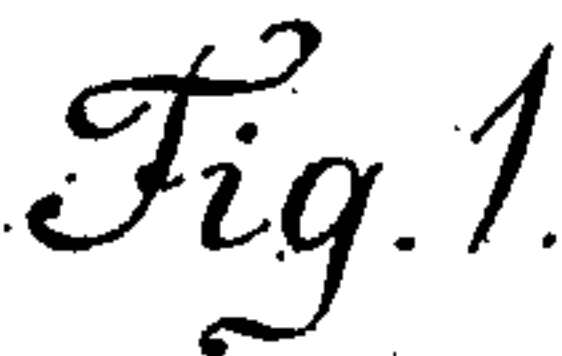


3 Sheets—Sheet 1.

No. 575,979.

Patented Jan. 26, 1897.



Witnesses  
George Baumann  
A. C. Connor

Inventor's  
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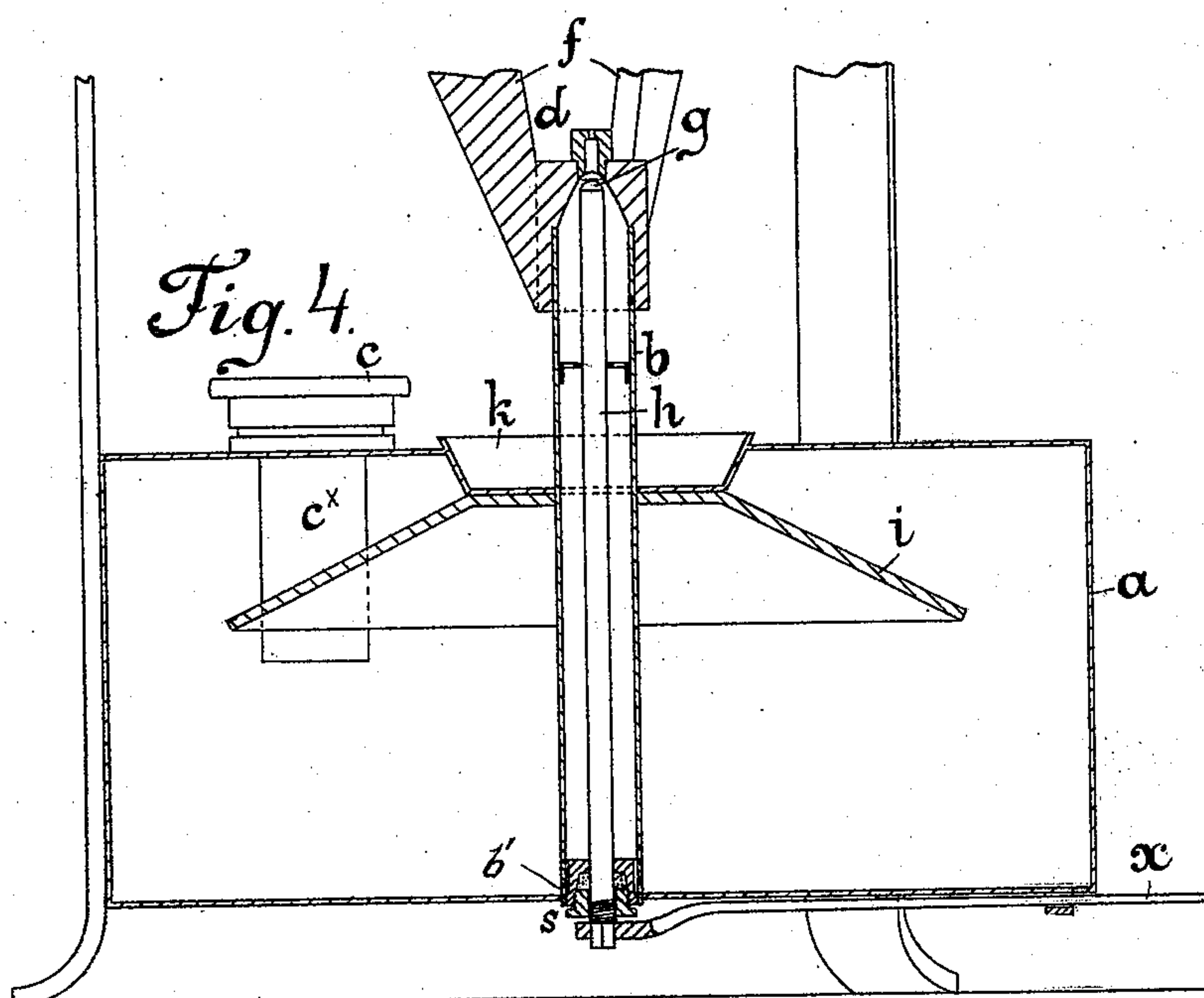
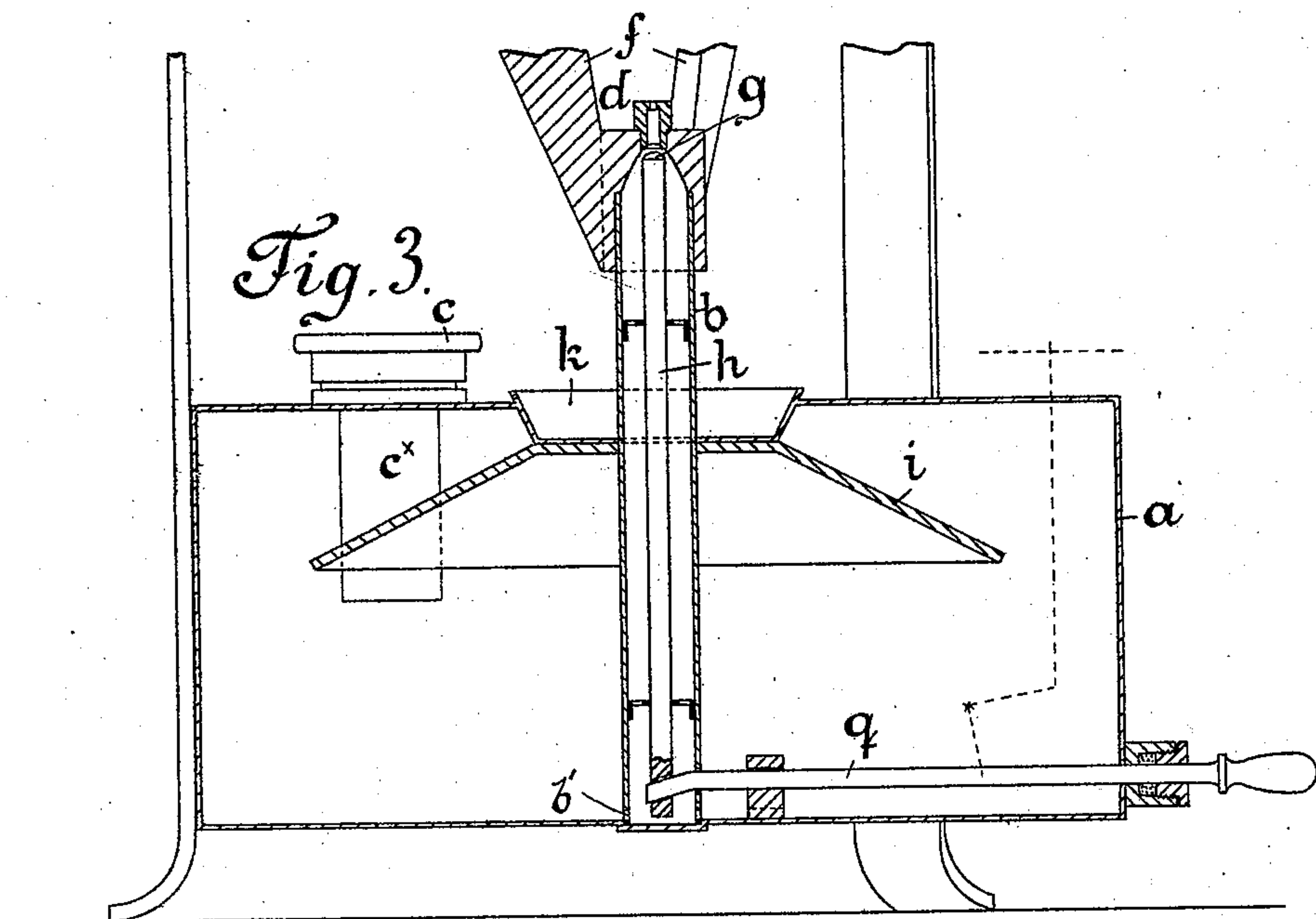
(No Model.)

3 Sheets—Sheet 2.

C. ÖSTLUND & A. E. MALMSTRÖM.  
PETROLEUM STOVE.

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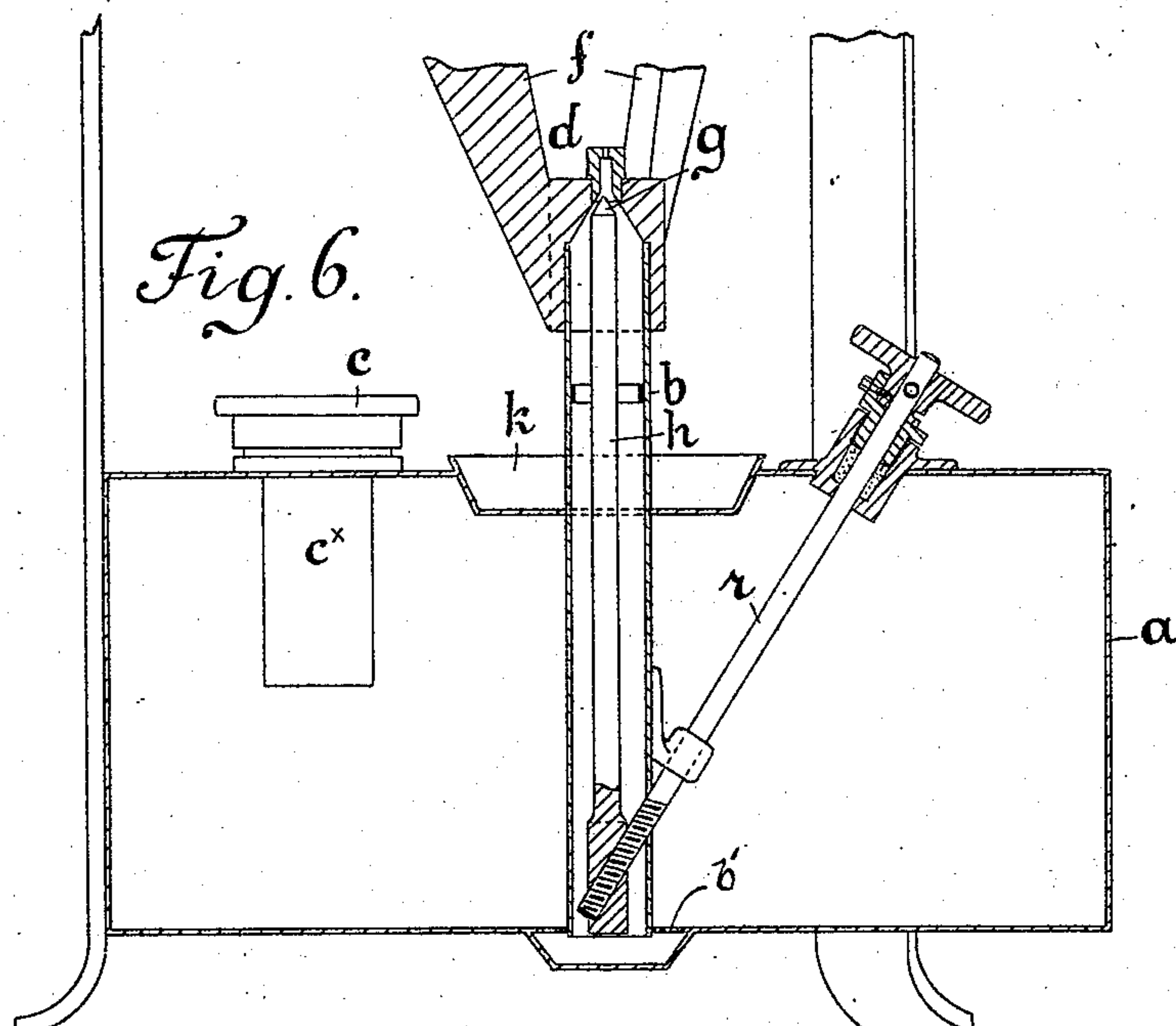
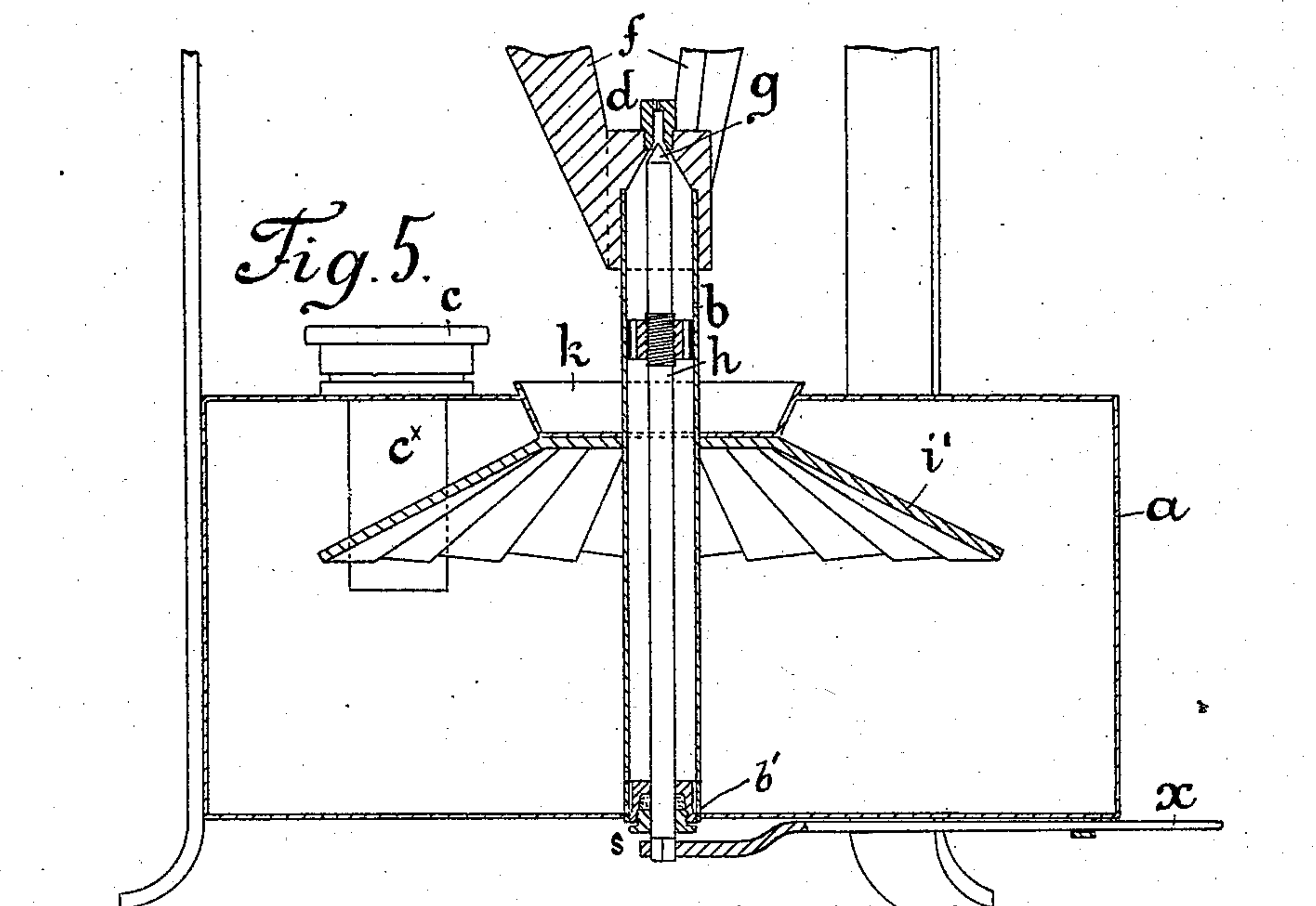
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3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

CARL ÖSTLUND AND AXEL ELIS MALMSTRÖM, OF STOCKHOLM, SWEDEN.

## PETROLEUM-STOVE.

SPECIFICATION forming part of Letters Patent No. 575,979, dated January 26, 1897.

Application filed June 17, 1895. Serial No. 553,044. (No model.)

*To all whom it may concern:*

Be it known that we, CARL ÖSTLUND and AXEL ELIS MALMSTRÖM, subjects of the King of Sweden and Norway, and residents of Stockholm, Sweden, have invented certain Improvements in Petroleum-Stoves, of which the following is a specification.

This invention relates to certain improvements in wickless petroleum-stoves in which the petroleum is forced up from the reservoir through a pipe (or channel) to a burner by means of air-pressure created in the petroleum-reservoir, and one object of the invention is to so construct the stove that a suitable quantity of air is retained in the upper part of the petroleum-reservoir when the latter is replenished with petroleum, said part of the reservoir thus forming an air-chamber.

Another object of this invention is to dispense with the pump hitherto used to produce the requisite pressure on the surface of the oil by effecting a sufficient heating of the air inclosed in the air-chamber, and, furthermore, to avoid the leakage that is liable to occur in such lamps or burners as hitherto made, in which the spindle of the regulating-valve passes through a hole in the side of the lower part of the burner.

In order to carry out this invention, we provide that the greater part of the petroleum-reservoir shall be situated above the mouth of the supplying-aperture in the reservoir, so that a quantity of air always remains there when the petroleum is supplied, and consequently the upper part of the reservoir is always an air-chamber. This may be obtained by providing a tube under the supplying-aperture, said tube extending sufficiently far down into the reservoir, or by arranging in such a manner that the petroleum cannot rise above a certain level, so that a sufficient part of the reservoir must remain filled up with air. The inclosed air is heated by the heat from the burner and thereby receives the pressure that is necessary to force the petroleum up to the burner.

A burner such as described in our application of March 20, 1895, No. 542,509, may be used, but a burner of other construction may be employed, provided it has a flame-spreading plate, and is constructed to give the nec-

essary heat to the supply-pipe and to the upper part of the reservoir.

The heating of the air inclosed in the air-chamber is facilitated and increased by providing in the air-chamber a projecting disk of metal, fixed to the tube leading to the burner or to the upper part of the reservoir or to both, or wings or other projections facilitating the ready transmission of the heat from the burner to the air in the air-chamber, and thus effectively contributing to this air, obtaining the necessary pressure to force up the petroleum.

To avoid leakage, according to this invention both the regulating-valve itself and its spindle are placed inside and along the pipe leading from the bottom of the reservoir to the burner, and the exit-aperture of the burner is so formed that it will be closed on the valve being raised. The valve is operated by moving its spindle up or down, and this can be effected in many ways, for instance, by a screw, a lever, or inclined planes. The above-described arrangement of the valve makes it possible to place the burner-opening and the axis of the petroleum-supply pipe in line, thus rendering the inside of the burner and the inside of the pipe easily accessible by a piece of wire or other appliance for cleansing purposes.

In the accompanying drawings several arrangements are shown by way of example.

The same letters represent corresponding parts in the different figures, of which—

Figures 1, 3, 4, 5, and 6 are vertical sections of a petroleum-stove constructed according to this invention and provided with different arrangements of valve apparatus. Fig. 2 is a plan of Fig. 1. In Fig. 1 lever-gearing, and in Fig. 3 inclined planes, are used for operating the valve, and in Figs. 4, 5, and 6 screws are shown for the purpose.

*a* is the petroleum-reservoir; *b*, the supply-pipe opening into the bottom of the reservoir through suitable side slots or openings *b' b'*.

*c* is the screw-cap, and *c<sup>x</sup>* short tube extending down from the filling-orifice into the reservoir.

*d* is the burner, *e* the flame-spreading plate, and *f* conducting-arms carrying the spreading-plate and fixed to the supply-pipe.



The regulating-valve *g* is on a spindle *h*.

*i* is a dish-shaped plate, of copper or other heat-conducting material, fixed within the air-chamber part of the reservoir to the pipe *b* and to the bottom of the ignition-cup *k*.

In Fig. 1 the valve-spindle *h* is jointed to the arm *l* of a lever. The fulcrum *m* of the lever is fixed to the bottom of the reservoir, but may equally well be fixed at the top, if desired.  
 10 From the arm *n* of the said lever a rod *o* passes upwardly through a stuffing-box in the roof of the reservoir, and on its threaded end is placed a nut *p* in such a way that it can be rotated but not moved longitudinally.  
 15 On turning this nut in one direction or the other the valve will be opened or closed.

In Fig. 3 the valve-spindle *h* is operated by moving a rod longitudinally to and fro. The end of the rod is provided with two inclined  
 20 planes, which, on the rod being moved, act on corresponding planes in a hole in the valve-spindle and cause the latter to move up or down. In this figure is diagrammatically shown by dotted lines an arrangement for  
 25 imparting the necessary movement to the rod *g* by means of a screw and nut, as in Fig. 1, in combination with a bell-crank lever.

In Figs. 4 and 5 the valve-spindle *h* is screw-threaded, in the former figure at the lower  
 30 end, and in the other near the top, and passes through a corresponding fixed nut. The spindle passes out through a stuffing-box *s* in the bottom of the pipe *b* or reservoir and has an operating-handle *x*, so that when the  
 35 spindle is turned to the right or left by the arm *x* the valve is opened or closed.

In Fig. 5 the heat-conducting disk *i'* is shown slitted or winged.

In Fig. 6 there is an inclined rod *t* immovable  
 40 lengthwise, which is screw-threaded at the lower end and takes into a screw-threaded hole in the valve-spindle *h*. On turning the rod *r* the spindle *h* will be moved up or down and at the same time a slight lateral move-  
 45 ment will be given to the spindle.

Several modifications in the constructions shown may be adopted and other means may be used for operating the valve or its spindle, provided the device by which the valve is op-  
 50 erated passes through the lamp at a place where the heat developed when the lamp is burning cannot act injuriously on the packing round such device.

The stove is put into operation in the ordi-  
 55 nary manner by first igniting spirit or the like placed in the cup *k*, and when this has nearly burned out opening the valve *g*, whereupon the vapor that has been produced rushes out through the exit-aperture in the nipple  
 60 and is ignited by the spirit-flame. The spreading-plate *e* and conducting-arms *f* are

heated, and the pipe *b* is kept sufficiently warm to vaporize the oil and heat the dish-like piece or projection *i* by conduction, and this piece *i* transfers the heat to the air in the air-cham-  
 65 ber and keeps up the necessary pressure therein. The effect of the piece *i* may be augmented by making incisions therein, as indicated, for instance, in Fig. 5.

We claim as our invention—

1. In a wickless petroleum-stove, the combination of a reservoir adapted to contain petroleum in its lower part only and air in its upper part, a pipe opening into the bottom of the reservoir and having a burner at its up-  
 75 per part, and means for heating the air in said upper part of the reservoir, substantially as and for the purpose set forth.

2. In a wickless petroleum-stove, the combination of a reservoir, having a feed-tube ex-  
 80 tending down into the same to leave a closed air-chamber in the reservoir, a pipe, opening into the bottom of the reservoir and having a burner at its upper part, and means for heating the air in said chamber, substantially as  
 85 and for the purpose set forth.

3. In a wickless petroleum-stove, the combination of a reservoir, having a feed-tube ex-  
 90 tending down into the same to leave a closed air-chamber in the reservoir, a pipe opening into the bottom of the reservoir and having a burner at its upper part, a heat-conducting disk or plate within said chamber and means for heating said disk or plate, substantially  
 95 as and for the purpose set forth.

4. In a wickless petroleum-stove, the combination of a reservoir adapted to contain petroleum in its lower part only, and air in its upper part, a pipe opening into the bottom of the reservoir and having a burner at its upper  
 100 part, and a valve-spindle extending through said pipe and out at the bottom of the reservoir, substantially as and for the purpose set forth.

5. In a wickless petroleum-stove, the combination of a reservoir adapted to contain petroleum in its lower part only, and air in its upper part, a pipe opening into the bottom of the reservoir and having a burner at its upper  
 105 part, and a valve-spindle extending through said pipe and out at the bottom of the reservoir, and a nut for said valve-spindle, situated above the reservoir, substantially as and for the purpose set forth.

In testimony whereof we have signed our  
 115 names to this specification in the presence of two subscribing witnesses.

CARL ÖSTLUND.

AXEL ELIS MALMSTRÖM.

Witnesses:

FREDRIK L. ENQUIST,  
 OSKAR RINGSTRÖM.