

# E. G. Kelley, Oil Still.

N<sup>o</sup> 67,988.

Patented Aug. 20, 1867.

Fig. 4.

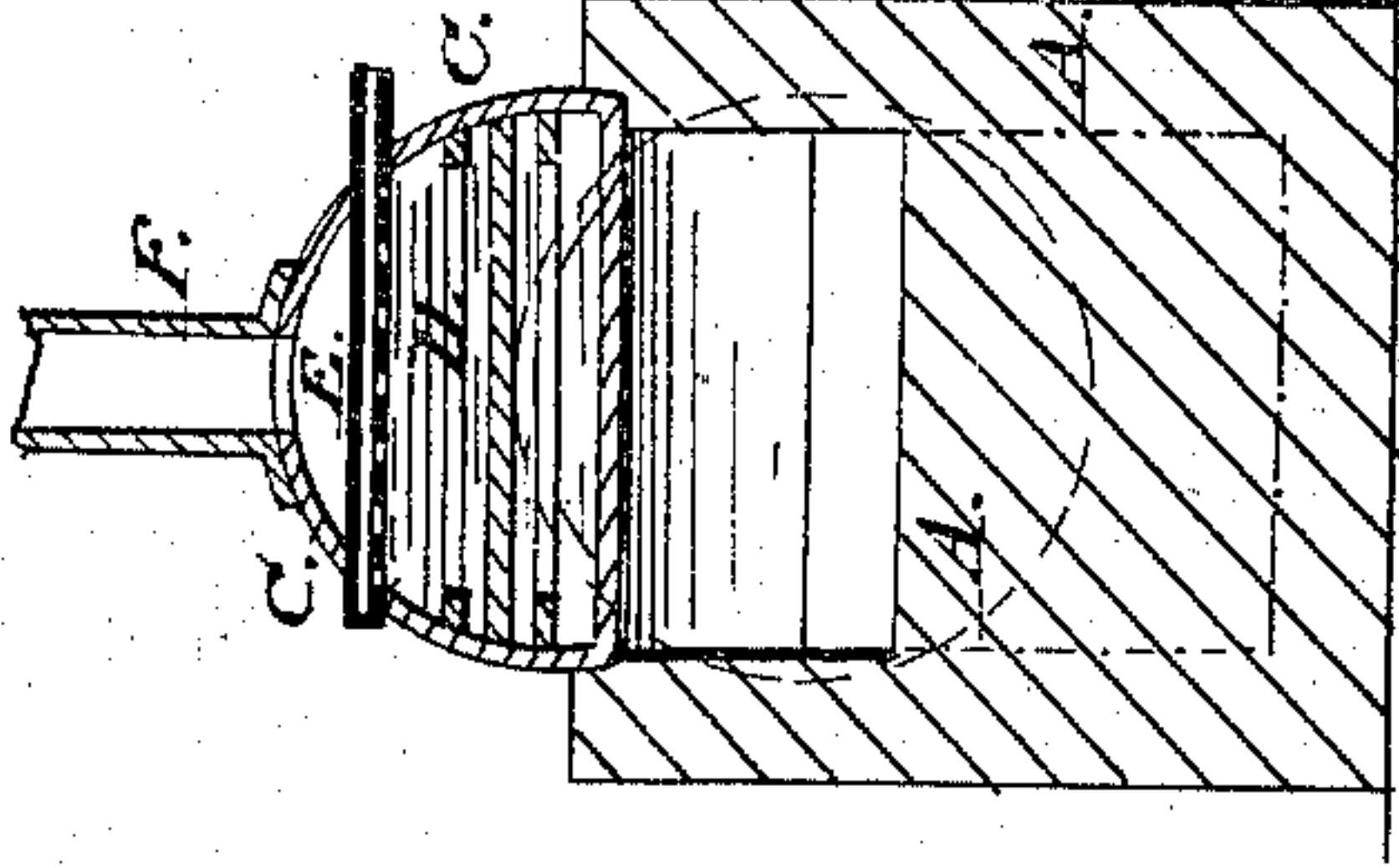


Fig. 5.

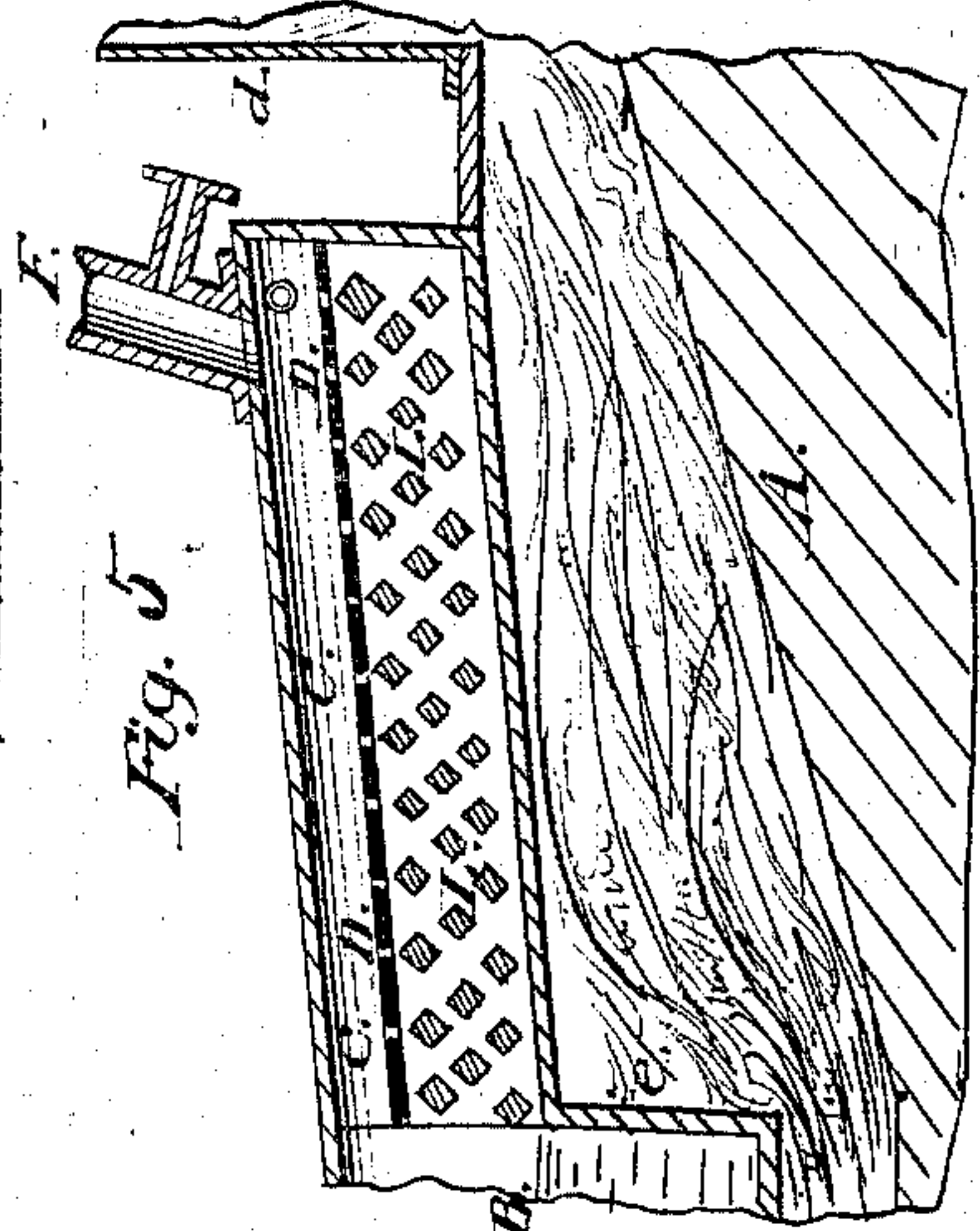


Fig. 2.

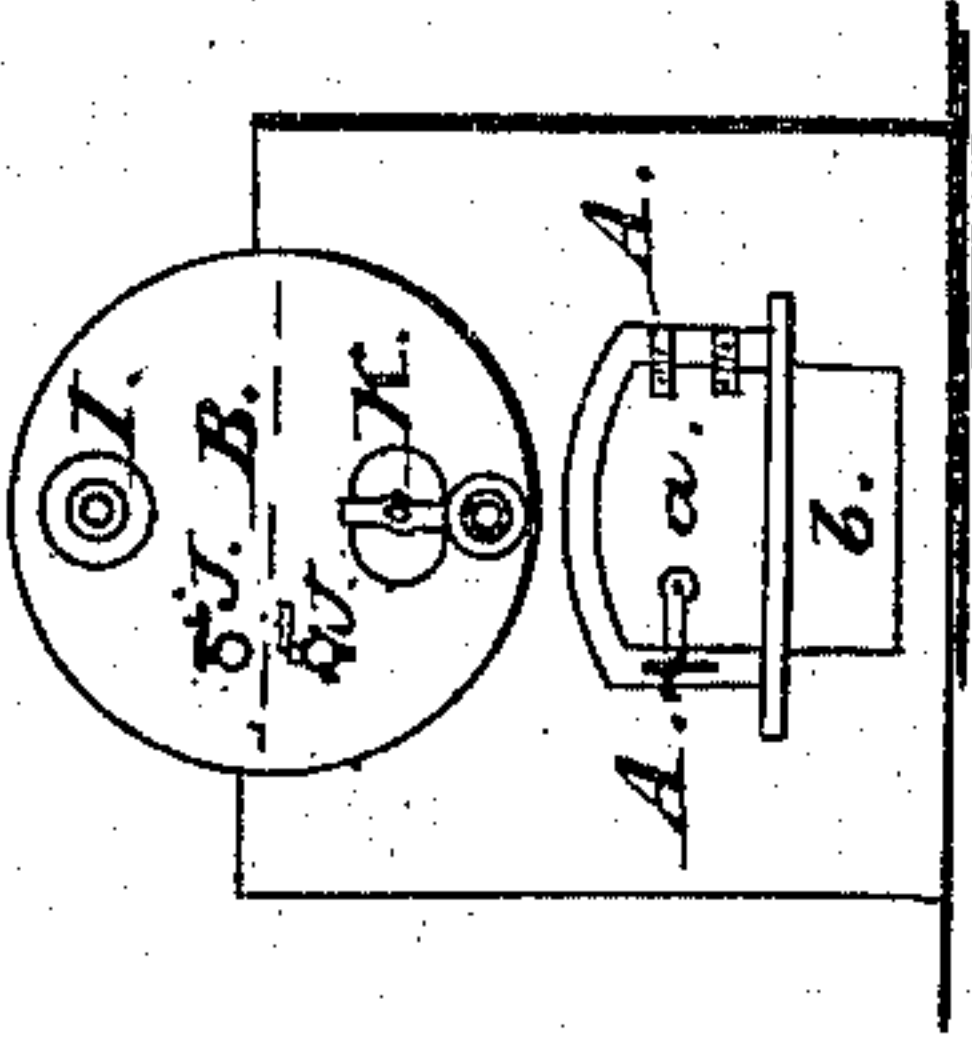


Fig. 3.

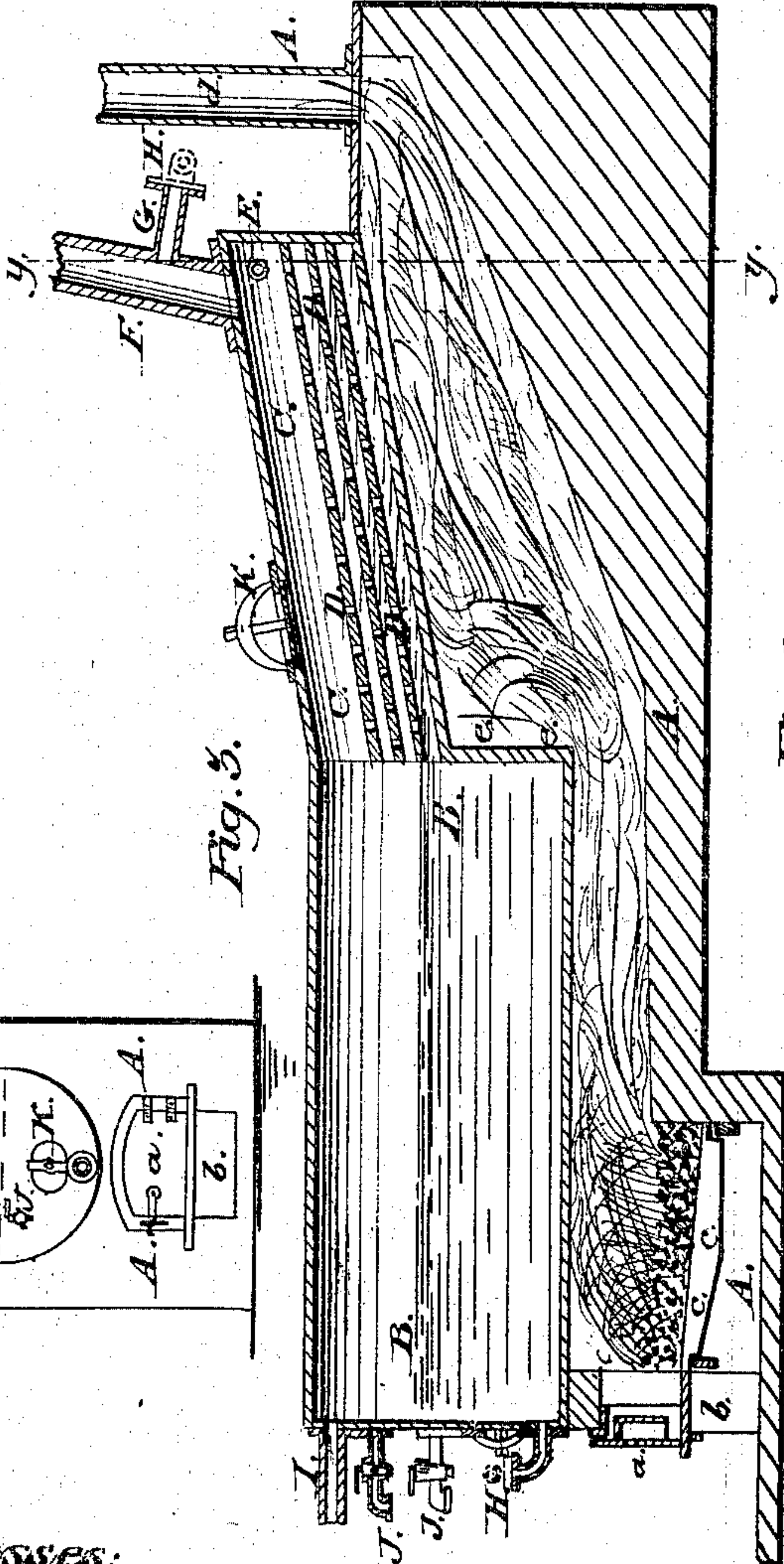
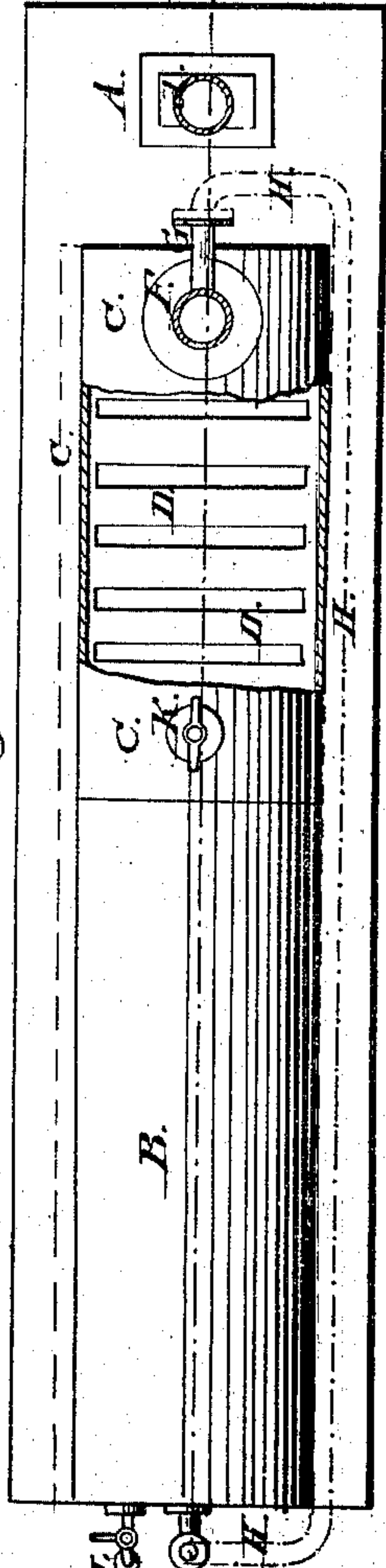


Fig. 1.



Witnesses:  
Geo. Pluche  
Wm. Furber

E. G. Kelley  
per Munnell  
Attorneys



# United States Patent Office.

E. G. KELLEY, OF NEW YORK, N. Y.

*Letters Patent No. 67,988, dated August 20, 1867.*

## IMPROVED PETROLEUM STILL.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I E. G. KELLEY, of the city, county, and State of New York, have invented a new and improved Petroleum Still; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a plan or top view, partly in section, of my improved still.

Figure 2 is a front elevation of the same.

Figure 3 is a longitudinal vertical section of the same, the plane of section being indicated by the line  $x x$ , fig. 1.

Figure 4 is a vertical cross-section of the same, the plane of section being indicated by the line  $y y$ , fig. 3.

Figure 5 is a detail longitudinal sectional view, showing a modification of evaporating shelves.

Similar letters of reference indicate corresponding parts.

This invention relates to a still for evaporating petroleum or other hydrocarbon liquids that is provided with two or more exits for the vapor, each of them being connected with a separate condenser or cooler for the purpose of separating, while the still is in continuous operation, the illuminating oil from the gasoline or naphtha.

The invention consists, first, in so constructing the still that the oil can be fed to it in such a manner that it will evaporate before it is collected in the still. For this purpose the cylindrical still is connected with an inclined semi-cylindrical vessel, which is arranged in line with the still and above the fire-passage, between the still and the chimney. In this vessel is a series of diaphragms, perforated plates, or other devices, over which the oil, when fed into the vessel at its upper end, is spread in thin sheets, and is partly evaporated by being thus brought in contact with the heated vapors ascending in the still.

The invention consists, second, in the arrangement of the flues for carrying off the vapor. One of these is arranged in the still, but little above the surface of the petroleum in the latter, and serves to carry off the sluggish, heavy vapors arising from the petroleum, which, when condensed in a suitable apparatus, form the illuminating oil. Another flue is arranged above the entrance to the feed-vessel for carrying off the lighter vapors; the latter flue is arranged slightly inclined, for the purpose of condensing and collecting the naphtha or gasoline which is produced by such condensation. The upper part of said flue may, if desired, be surrounded by a suitable cooling apparatus.

A represents a furnace, of suitable construction and dimensions, made of brick or other suitable material, of about the shape indicated in fig. 3. It has a fire-door,  $a$ , ash-box  $b$ , grate  $c$ , near one end, and a chimney,  $d$ , near the other end, as shown. B is the cylindrical boiler, in which the oil is to be distilled. It is made of sheet metal, or other suitable material, about half as long as the furnace, and of suitable diameter. It is supported above that end of the furnace in which the grate is arranged. At its inner end it is connected with a semi-cylindrical or D-shaped vessel, C, which is set inclined above the outer end of the furnace, so as to communicate with the outer end of the cylinder B, as is clearly shown in fig. 3. It enters the rear head  $e$  of the cylinder, above the horizontal diameter of the same, as shown. In the vessel C is arranged a series of inclined diaphragms or perforated plates, D D, upon which the liquid is spread as it flows down from the upper end of the upper plate to the lower or inner end of the lower plate. Through a perforated horizontal pipe, E, the crude liquid flows in small jets upon the upper plate D, and is spread upon the same, so that it is exposed to the action of the heated vapors ascending from the still. It trickles down through the holes in the upper plate upon the lower plate, and thence upon the next lower plate, and so forth, until it comes into the cylinder. By this arrangement rapid distillation will be effected, as the oil will be partly distilled before it enters the cylinder. To collect the lighter vapors, a pipe, F, is arranged upon the upper end of the vessel C, the height of which is varied in accordance with the degree of consistency which it is desired to have in the liquid that is gained from the upper and lower end of the said pipe. The latter is inclined, as shown, for the purpose of collecting the liquid that is condensed in it, and guiding it into a branch pipe, G, whence the liquid may be conducted to a suitable reservoir, or into the still B, to aid the distillation, or for other purposes. In the latter case it would be conducted through a pipe, H, to the cylinder B, as is indicated by red lines in figs. 1 and 3. The main products of distillation, the vapors,



which, when condensed, form the illuminating oil, are carried off through a pipe, I, which is arranged in the front head of the cylinder a little above the level of the contents of the latter. These vapors are heavy and sluggish, and will not be carried up to the pipe F. In fact it is of importance that the pipe I is not too far above the surface of the oil in the cylinder, as it would not be reached by the heavy vapors without burning or browning them. The height of the material in the cylinder is regulated by means of suitable gauges J J, which are arranged in the front head of the cylinder B, as shown in figs. 1, 2, and 3. Man-holes K K should be arranged in the head of the cylinder B, and also in the vessel C, (as in fig. 3,) to allow the apparatus to be cleaned. In place of the plates D, blocks L L may be arranged in the vessel C, as shown in fig. 5, for the purpose of spreading and evaporating the oil, or any other arrangement may be used by which the same object is attained.

A still arranged as described will be continually working, and will do the work more thoroughly and satisfactorily than the ordinary stills now in use, as it will require less time and fuel to distill a given quantity of oil, and as it separates the naphtha and gasoline from the illuminating oil, which is of great importance.

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

1. Providing a still for petroleum or other hydrocarbon liquids with two pipes F and I for carrying off and separating the products of distillation, substantially as set forth.

2. The cylindrical boiler B, in combination with the inclined vessel C, in which are inclined diaphragms D, or their equivalents, substantially as and for the purpose herein shown and described.

3. The above, in combination with the inclined pipe F, when the same is arranged as set forth, and with the pipe I, all made and operating substantially as and for the purpose herein shown and described.

E. G. KELLEY.

Witnesses:

A. V. BRIESEN,  
ALEX. F. ROBERTS.