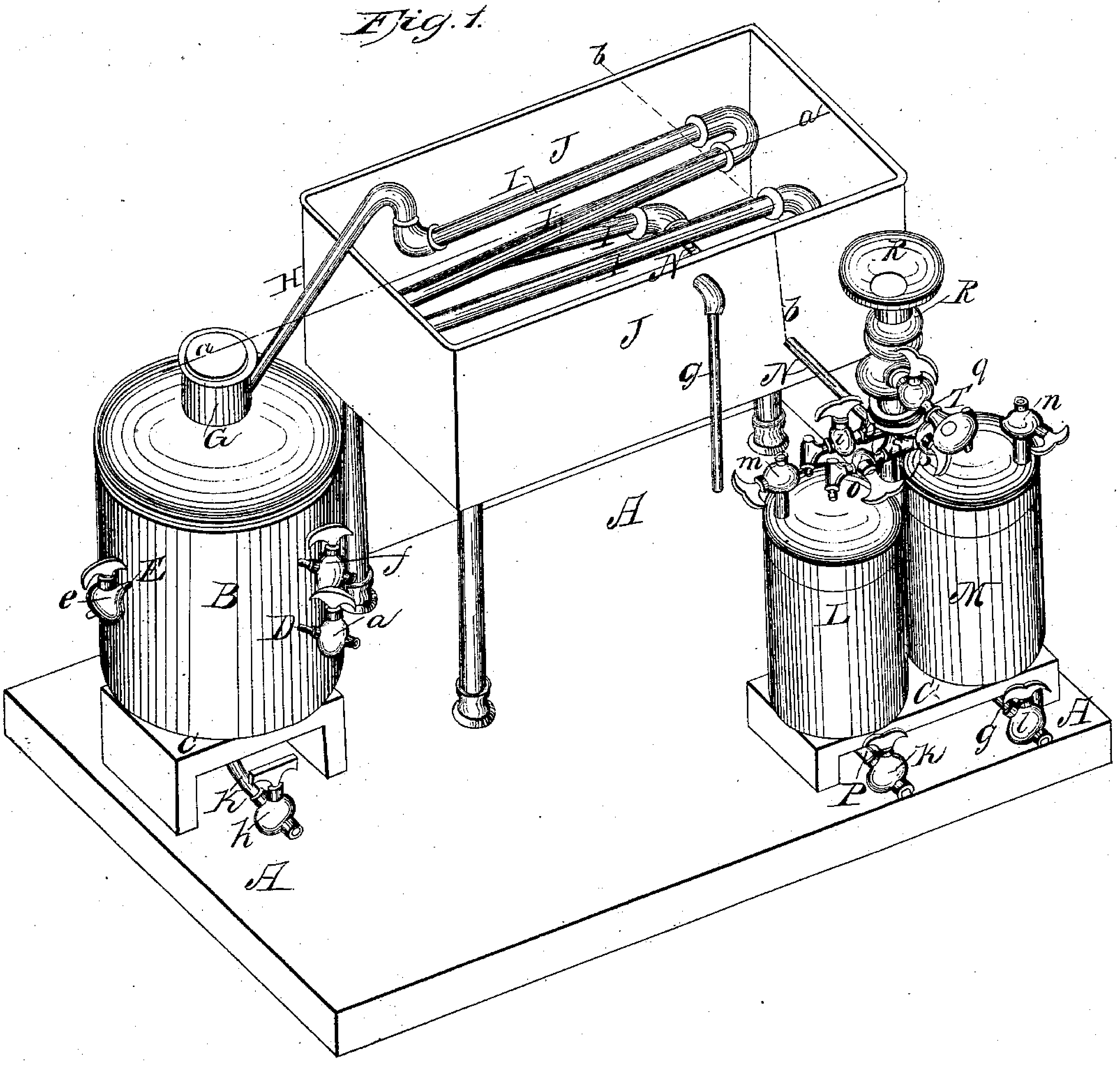
2 Sheets—Sheet 1.

H. W. C. TWEDDLE.

DISTILLING OIL.

No. 34,324. Patented Feb. 4, 1862.

Fig. 1.



Witnesses:
John H. Bailey
H. Sprout

Inventor:
Herbert W. C. Tweddle

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

2 Sheets—Sheet 2.

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Fig. 3.

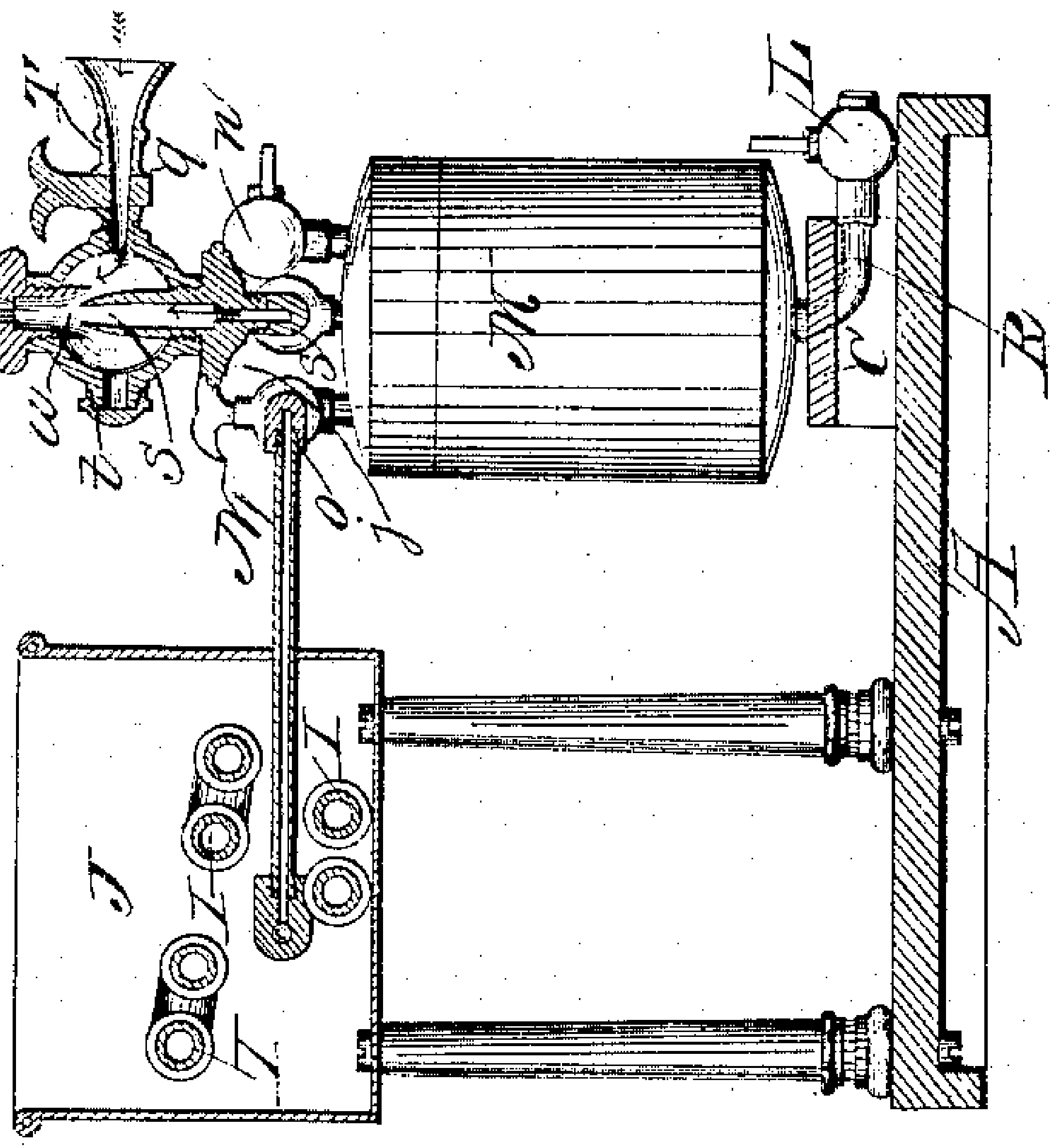


Fig. 5.

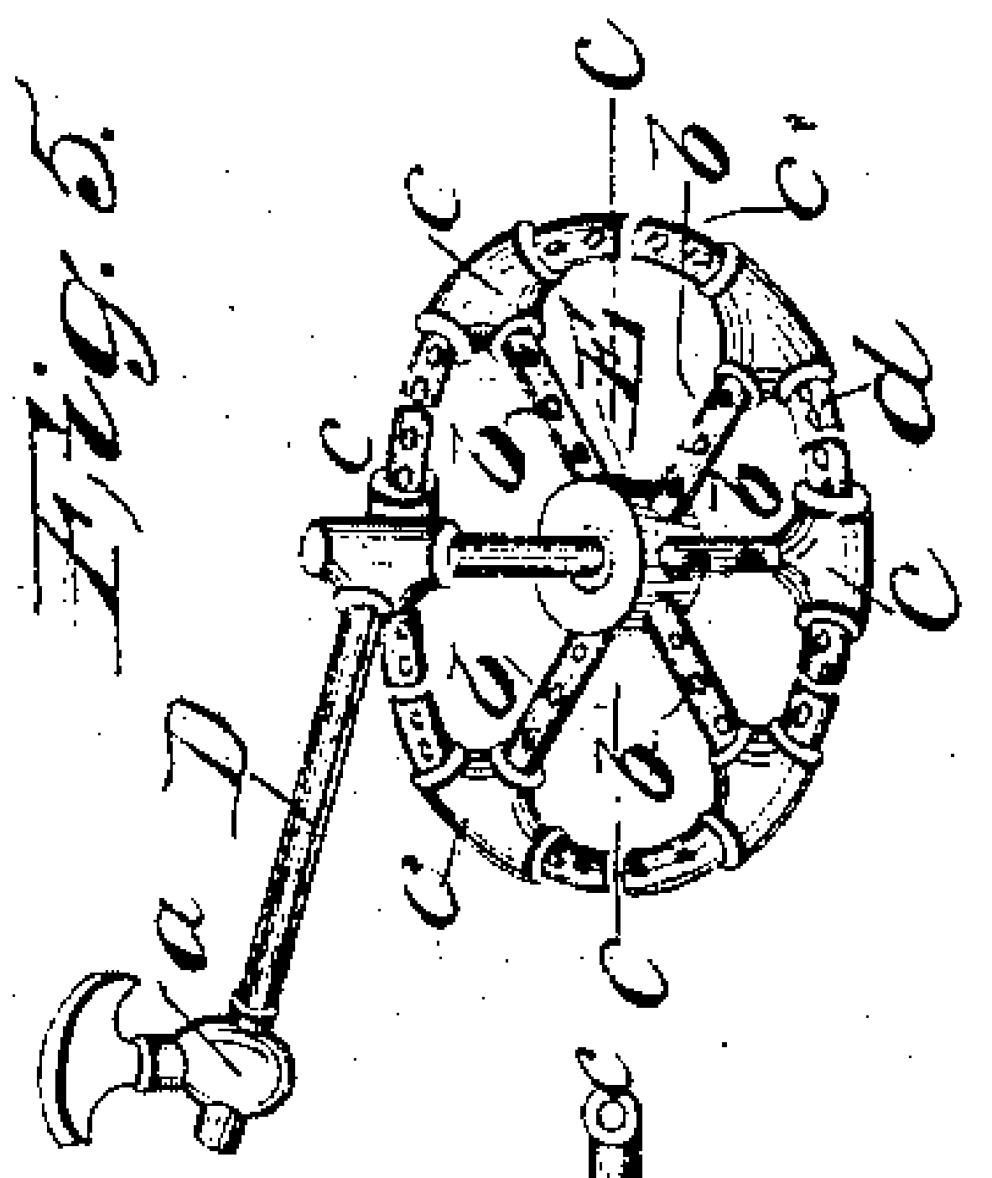


Fig. 6.

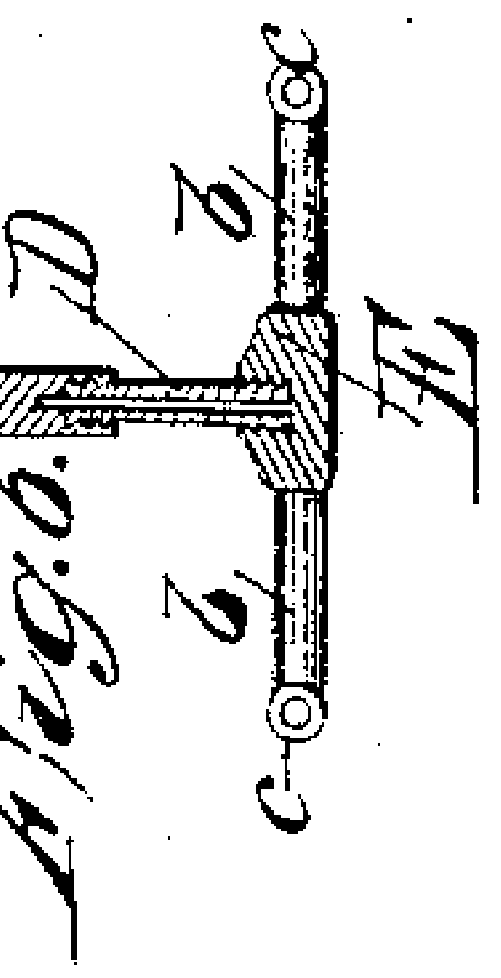


Fig. 2.

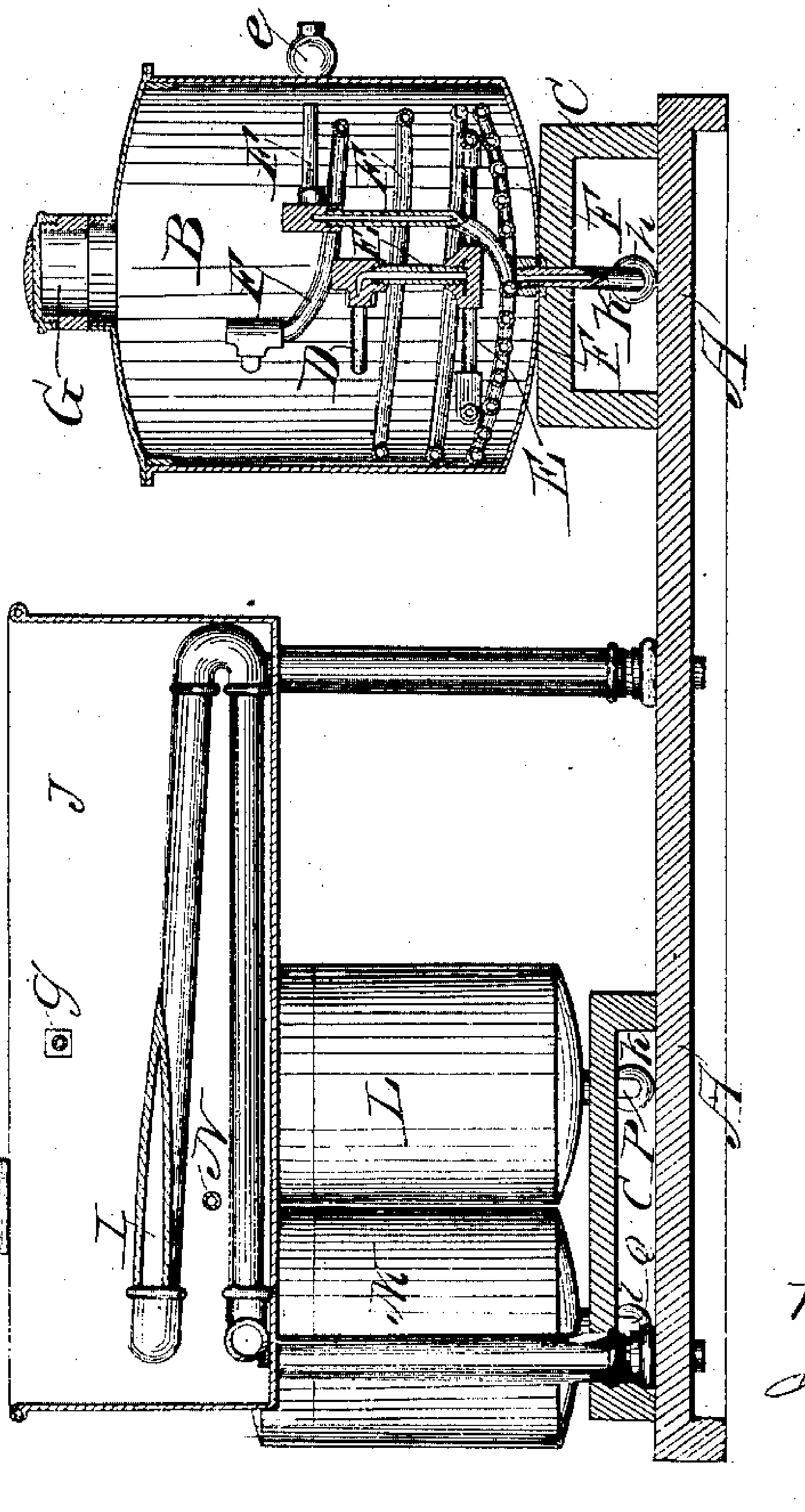
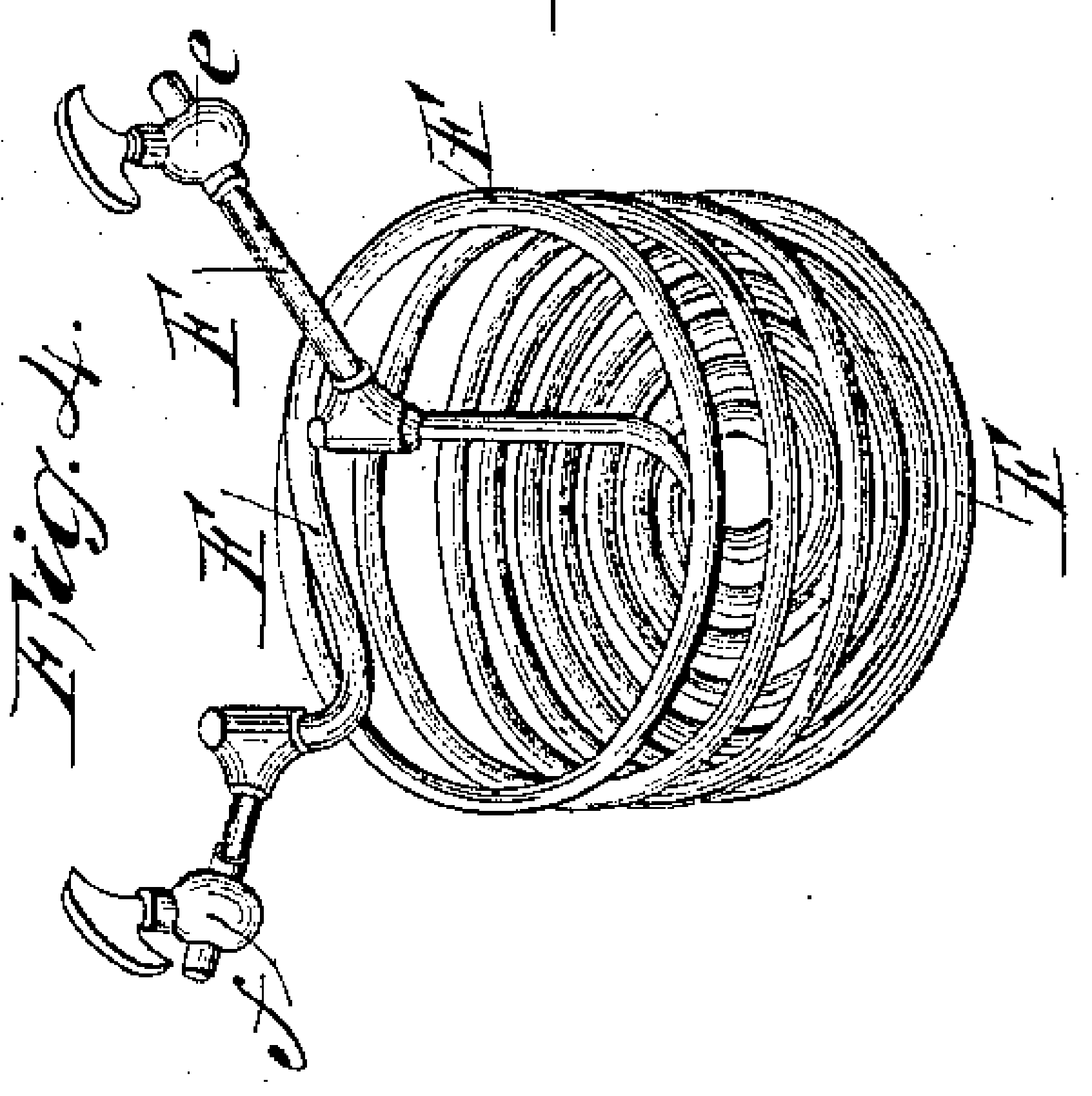


Fig. 4.



Witnesses
John H. Bailey
H. Sprout

Inventor:
H. W. C. Tweddle

UNITED STATES PATENT OFFICE.

HERBERT W. C. TWEDDLE, OF GREAT BRITAIN.

IMPROVED APPARATUS FOR DISTILLING COAL-OIL AND OTHER SUBSTANCES.

Specification forming part of Letters Patent No. **34,324**, dated February 4, 1862.

To all whom it may concern:

Be it known that I, HERBERT W. C. TWEDDLE, an alien and subject of the Queen of Great Britain and Ireland, have invented a new and useful Improvement in the Apparatus for Distilling Petroleum or any other Hydrocarbon Oil or Fats of any Description; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the apparatus. Fig. 2 is a longitudinal section through the line *a a* of Fig. 1. Fig. 3 is a cross-section through the line *b b* of Fig. 1. Fig. 4 is a perspective view of the coil steam-pipe F detached from the still. Fig. 5 is a perspective view of the oil-charging pipe D and a distributer, E. Fig. 6 is a perpendicular section through the line *c c* of Fig. 5.

Like letters in all the figures represent the same parts of the apparatus.

The nature of my invention consists in an apparatus for distilling petroleum or any other hydrocarbon oil or fats of any description by means of superheated steam, so that fire is dispensed with in proximity to the still, thus rendering the process of distillation much safer than in the usual mode, and insuring permanent soundness to the still and pipes.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the base for the still and its appurtenances.

B is the still, which rests on the pedestal C.

D is the oil-charging pipe connecting the still to the reservoir. The latter is not shown in the drawings. The pipe D has a stop-cock, *a*, to cut off the supply of oil when necessary.

E is a steam-distributer or blow-pipe. The radial arms *b* and the rim *c* are perforated with holes *d*, to insure an equal distribution of superheated steam through the still. The steam-pipe F is provided with a stop-cock, *e*, and a blow-pipe, *f*.

G is the dome of the still.

H is a discharging-pipe through which the refined oil flows and passes through the series of condensing-pipes I, which are arranged in the condensing-tank J. Said tank has a stream of cold water constantly flowing into it. Near its top it has an overflow-pipe *g*. The residuum from the oil runs from the bottom of the still B into the waste-pipe K, leading from the bottom of the still. Said pipe has a stop-cock, *h*, so as to only open the pipe when necessary to discharge the residuum.

L and M are receivers, which are on the pedestal C′, and into which the oil passes from the condensing-pipes I through the pipe N and branch pipe O, which latter is provided with stop-cocks *i j*, for the purpose of cutting off the suppiy of oil into the receiver. The latter cock is seen in Fig. 3.

P and Q are oil-discharging pipes of the receivers L and M. They have stop-cocks *k* and *l*. At the top of the receivers are air-cocks *m* and *n*, which are opened when a vacuum is to be destroyed.

R is a device for producing a vacuum, which I denominate a "vacuum apparatus," which I use to produce a vacuum in the receivers L and M and back through the condensing-pipe to the still, for the purpose of producing a flow of oil therein from the still B. Said vacuum apparatus connects with the receivers by means of the branch pipe S, which has stop-cocks *o* and *p*. The said vacuum apparatus has a vacuum-chamber at or near its middle, of globular form, which connects by means of a pipe with the branch pipe S. I do not confine myself, however, to this form, as the form may be varied without materially injuring the effect of the chamber; and from said chamber there extends upward an outlet-pipe, which is made funnel shaped at its outer end.

T is a steam-emission pipe, which connects with the vacuum apparatus R. It has a stop-cock, *q*, for cutting off the steam from the vacuum apparatus and destroying or regulating the vacuum. The receivers L and M are used alternately, the one not in use having its connection cut off with the oil branch pipe O and the vacuum apparatus R.

The operation is as follows: After the still is charged, I heat the contents with steam, which is let into the pipe F. Then I turn the steam on the hurricane R, which immediately commences to produce a vacuum in the receiver L and pipes leading to the still B, and distillation becomes very rapid. When the receiver L is full, I turn the keys of the stop-cocks *i* and *o*, to cut off its connection with the oil branch pipe O and the vacuum apparatus R, and open the communication of the receiver M with said pipe and hurricane. While this receiver is being filled, I empty the receiver L by opening the cock *k*, and when the receiver M is filled with oil I reverse the operation of the receivers alternately.

The object of my improvement is to preclude the necessity of having fire in or near the building in which the operation of distilling is carried on, and to do that, which has been hitherto attended with considerable danger, perfectly safe. It obviates, besides the continual annoyance and derangement of the business, which frequently occurs in the old mode by the cracking or burning out of the still, leakage of pipes, &c. No leakage from defective joints can possibly occur so that the gas would escape, as the pressure of the atmosphere from without is greater than the internal pressure. Another advantage is having the products of distillation received in the immediate vicinity of the still, so as to have the whole operation under the eye of the workman The apparatus can be arranged with any still without any derangement of the former. The coil in the interior of the still is for the purpose of heating the oil up to distilling temperature. The blow-pipe is used when the operator thinks it desirable.

Having thus fully described the construction and operation of my improvement in stills for distilling petroleum or any other hydrocarbon oil or fats of any description, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The vacuum apparatus R, with which by the use of steam I produce a vacuum.
2. The use of the vacuum apparatus R, arranged substantially as described, in combination with the receivers L and M, or their equivalents.
3. The use of the vacuum apparatus R, in combination with the steam-pipe F, arranged in the interior of the still, substantially as described.

Witness my hand and seal.

HERBERT W. C. TWEDDLE. [L. S.]

Witnesses:

JOHN H. BAILEY,
H. SPROUL.