

(No Model.)

F. T. KING.  
APPARATUS FOR DISTILLING.

No. 328,316.

Patented Oct. 13, 1885.

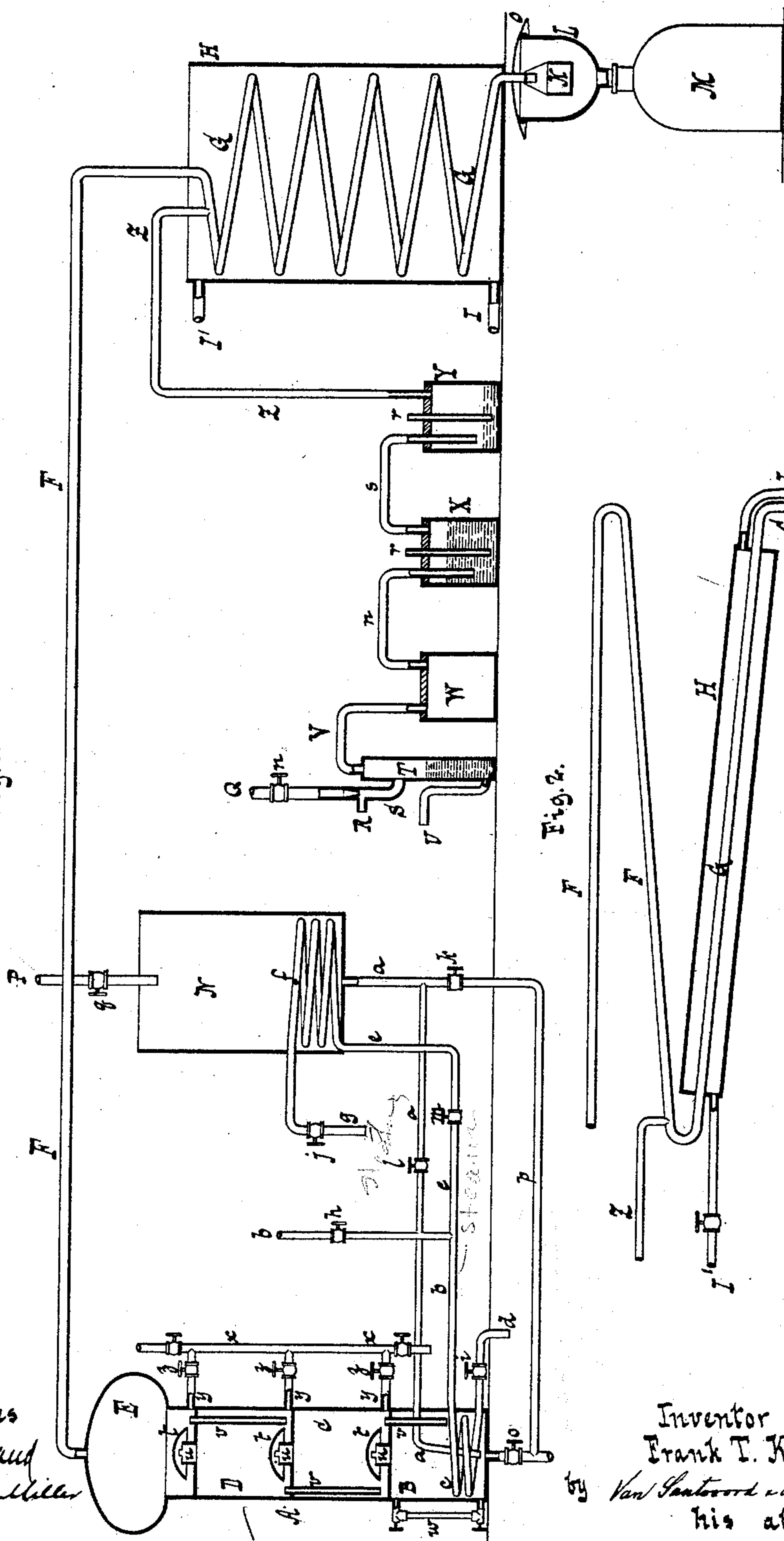


Fig. 1.

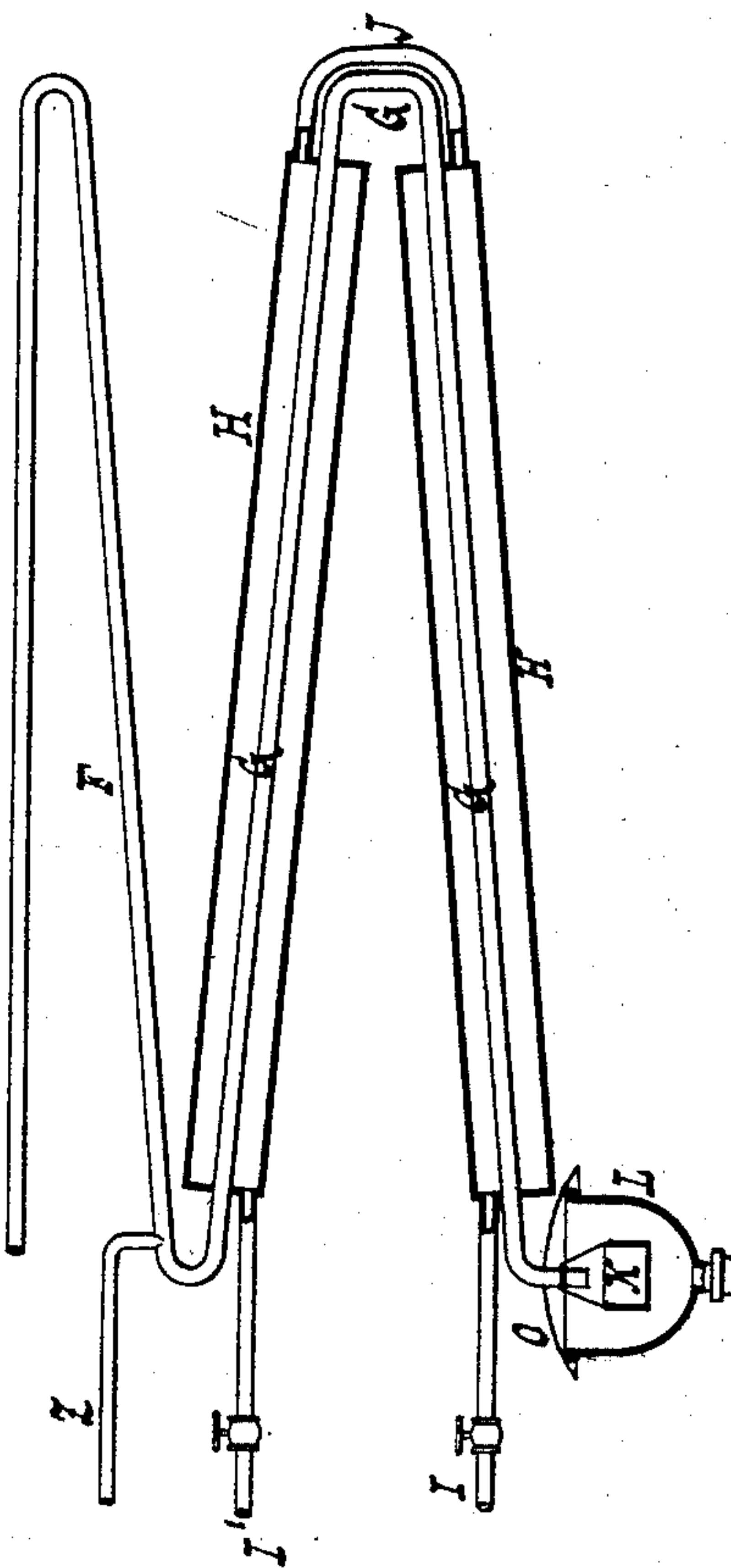


Fig. 2.

Witnesses  
Otto Kufelaud  
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his att'ys

# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR DISTILLING.

SPECIFICATION forming part of Letters Patent No. 328,316, dated October 13, 1885.

Application filed April 30, 1885. Serial No. 164,019. (No model.)

### *To all whom it may concern:*

Be it known that I, FRANK T. KING, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Distilling Apparatus, of which the following is a specification.

This invention relates to an apparatus for distilling or treating water or other bodies, and by its use atmospheric air, gas, or other substances may be injected into or mixed with the substance under treatment throughout the duration of the process.

The apparatus is illustrated in the accompanying drawings, in which Figure 1 is a side elevation, partly in section. Fig. 2 shows a side view of a modification, partly in section.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates a receiver or boiler. Water or other fluid may be introduced into the chamber B of said receiver or boiler through the tube or conduit *a* leading from the reservoir N. This reservoir N may be kept filled by opening the stop-cock *q* of the supply-pipe P. The contents of the reservoir N may have their temperature more or less elevated by any suitable supply of heat—as, for example, by opening the stop-cocks *h m j*—whereby steam may be admitted from the steam-supply pipe *b* through the conduit *e* to the coil *f* in the reservoir N. The spent steam or water can be allowed to pass off through the pipe *g*.

The receiver or boiler is divided into a series of chambers, B C D, and is provided with a head, E.

The water or fluid from the reservoir N, upon the opening of the stop-cock *l*, flows through the conduit *a* into the chamber B, and can be there heated by any suitable means—as, for example, by steam from the supply-pipe *b* flowing through the coil *c* in the chamber B. The spent steam or water from the coil *c* can be made to pass off through the stop-cock *i* and pipe *d*. The height of the fluid in the chamber B can be seen by an indicator or fluid-glass, *w*.

The chambers B C D are separated from one another by partitions or diaphragms having openings, which openings are formed by tubes *u*, projecting a short distance above the diaphragms. A short distance above the upper

mouth of each tube *u* is a plate or hood, *t*, which hood is supported on arms or in any suitable manner.

The vapor rising from the chamber B rises through the tube *u* and strikes against the plate or hood *t*, whereby any impurity or sediment which may have been carried up by the ascending vapor is precipitated onto the diaphragm, while the vapor passes on up through the chamber C and through a second tube, *u*, and under a second hood, *t*, and so on through any desired number of chambers, until the vapor enters the head E. The result of this successive passage through the tubes *u* and under the hoods *t* is that the vapor enters the head E perfectly pure and free from all sediment or foreign matter.

Each diaphragm has a tube or conduit, *v*, the upper mouth of which is a short distance above the diaphragm, but below the level of the upper mouth of the tube *u*. Through these tubes *v* fluid, together with impurities which may have collected, flow from the upper chambers into the lower chamber, B.

If it is desired to completely empty the chambers C and D and the head E, the stop-cocks *z* are opened, when all fluid will pass off through the tubes *y x*. The chamber B can be emptied by opening the stop-cock *o*.

The reservoir N can be emptied through the pipe or conduit *p* by opening the stop-cock *k*. From the head E the vapors pass into tubes or conduits F G, in which they are condensed. The tube or conduit T may be of considerable length, as shown in Fig. 1, and, if desired, may be bent back and forth, as shown in Fig. 2, so that the contents of the tube F are considerably cooled before entering the tube G. The tube G rests in water or other cooling-liquid in the tank H, and in Fig. 1 said tube G is coiled or bent into a worm shape. In Fig. 1 the cooling-liquid can be made to enter the tank H through the pipe I, and to flow off through the pipe I'. In the modification shown in Fig. 2 the tube G passes through jackets H H, which surround said tube G. The cooling-liquid can be made to enter through the pipe I into the lower jacket H, thence through pipe J into the upper jacket H, and out through the pipe I'.

In flowing through the tubes F G the vapors



are cooled and condensed, and can be led from the tube G into a suitable receiver, M—as, for example, into a bottle. L is a funnel for leading the liquid into the receiver M.

5 The letter Z indicates an injection-tube communicating with the interior of the condensing-tubes F G. This injection-tube can be used to introduce into the condensing-tubes any substance or substances which it is desired  
10 to mingle with or to have act upon the contents of the condensing-tubes—as, for example, atmospheric air or carbonic acid.

My device will be found very useful, for example, in the purification of water. Water  
15 which is used for drinking purposes is sometimes distilled, so as to free it from impurities. An objection to distilled water for drinking purposes is that distilled water is insipid. This objection has been removed by causing the wa-  
20 ter to fall through a column of air or by agitating the water in the presence of air. By my device the water can be distilled and mingled with air so as to be agreeable for drinking as soon as it issues from the apparatus.

25 An apparatus for injecting air is illustrated in Fig. 1, where Q is an injector. This injector consists of a tube or conduit, through which water can be made to flow on opening the stop-cock *n*. The lower part of this tube ends  
30 in a contracted opening, through which the water issues with considerable velocity, causing air to enter through the opening R. The air and water then flow through the tube S into the receiver T, from which the water flows off  
35 through the opening U, while the air is forced through the tube V. The air is then purified, which can be accomplished by an arrangement such as shown in Fig. 1, where W X Y  
40 are receivers or Woulfe bottles. The air entering the bottle W, moisture that is carried along through the tube V will be precipitated in said bottles W, while the air passes on through the tube *n* into the bottle X. This bottle X contains a purifying-liquid—as, for example,  
45 sulphuric acid—by which the air is purified and dried. From the bottle X the air passes through the tube *s* into the bottle Y, where any sulphuric acid and moisture that have

been carried through the tube *s* are precipi-  
tated. The letters *r r* indicate safety-tubes. 50  
From the bottle Y the air flows through the tube Z into the condensing-tubes F G, where it mingles with the contents of said tube—as, for example, distilled water in said tubes. From the condensing-tube G the water need  
55 not flow directly through the funnel L into the bottle or receiver M; but such water may be agitated or caused to pursue an irregular course in the presence of air. A simple manner of agitation is produced by attaching or suspend-  
60 ing a cup or dish or a plate close below the exit-opening of the tube G, when the water flowing from said tube G will strike against or fill said cup, dish, or plate, and upon overflow-  
65 ing or running off the water will run from the plate, cup, or dish through the funnel L into the receiver M. The result of this distillation and mingling with air is that the water as it enters the receiver M is not only perfectly  
70 pure, but it also has a sweet and agreeable taste, and is immediately fit for drinking.

The funnel L should be covered with a lid or cover, O, of cloth or suitable material, through which cover the end of the tube G passes. This lid or cover O prevents dust and foreign mat-  
75 ter from falling into the funnel L.

Of course in place of atmospheric air carbonic acid, or a mixture of carbonic acid and atmospheric air or oxygen or other gas or other substance or substances, as desired, may  
80 be forced through the conduit or tube Z. The apparatus may also be used for distilling other bodies besides water, if desired.

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

85 The combination, with a boiler, A, of a condenser, an air or gas injector, and an apparatus, substantially as described, for purifying the air or gas, as set forth.

In testimony whereof I have hereunto set my  
90 hand and seal in the presence of two subscribing witnesses.

FRANK T. KING. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.