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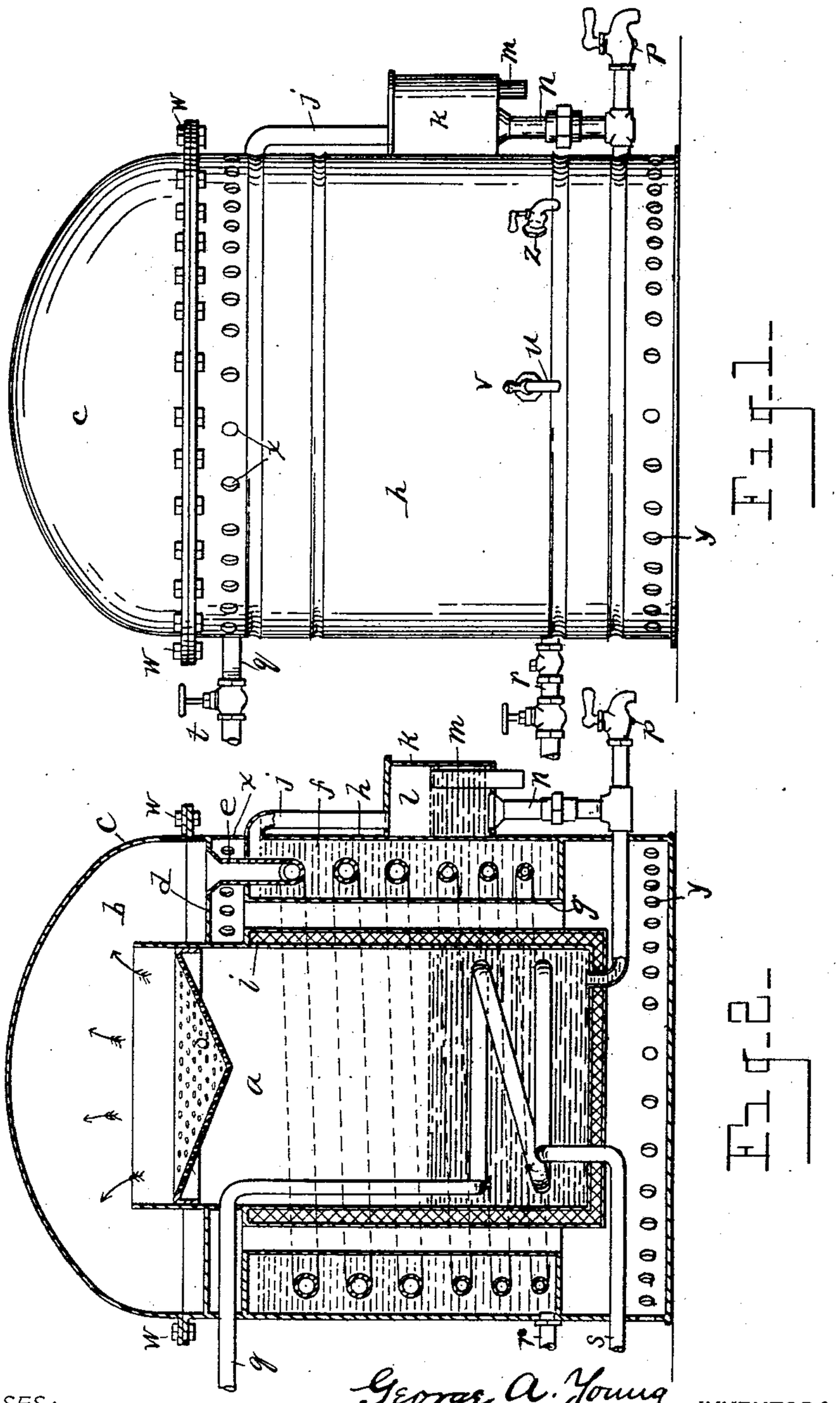
G. A. & C. A. YOUNG.

WATER STILL.

APPLICATION FILED MAR. 6, 1903.

NO MODEL.



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No. 750,747. Patented January 26, 1904.

UNITED STATES PATENT OFFICE.

GEORGE A. YOUNG AND CHARLES A. YOUNG, OF DETROIT, MICHIGAN.

WATER-STILL.

SPECIFICATION forming part of Letters Patent No. 750,747, dated January 26, 1904.

Application filed March 6, 1903. Serial No. 146,433. (No model.)

To all whom it may concern:

Be it known that we, GEORGE A. YOUNG and CHARLES A. YOUNG, citizens of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Water-Stills, of which the following is a specification, reference being had to the accompanying drawings, which form a part of this specification.

Our invention has for its object an improved automatic water-still; and it consists of the construction, combination, and arrangement of devices hereinafter described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a view in elevation showing our invention. Fig. 2 is a view in vertical section therethrough.

The aim of our invention is to provide a water-still of superior efficiency and utility, whereby water may be generated into steam and the steam condensed in a more economical and satisfactory manner than has heretofore been the case.

We carry out our invention as follows:

In the drawings, *a* denotes a steam-generating chamber, and *b* a condensing-chamber, into which the generating-chamber communicates. The condensing-chamber is formed by an inclosing cap or cover *c*. The condenser-chamber is provided with an annular base or gutter, (indicated at *d*,) with which communicates a coil or worm *e*, said coil being led through a cylindrical condenser-tank or cooling-chamber *f*, filled with water or other cool liquid, as indicated in Fig. 2. The cooling-chamber *f* is formed by suitable jackets *g* and *h*, located about the generator *a* and spaced therefrom. The generator is preferably jacketed with any suitable non-conducting material, (indicated at *i*.) The cooling-chamber *f* is provided with an overflow-pipe (indicated at *j*) communicating with said chamber at the top thereof, the overflow-pipe leading into a regulating device *k*, said device forming a chamber *l* therewithin, and is provided with a waste-pipe *m*, projecting upward therewithin to the height of the desired water-line therein and in the generating-chamber *a*. With the chamber of the regulating device *k* also communicates a feed-pipe *n*, leading into the base of the generating-chamber and provided with a draw-off cock *p*. Live steam is led into and about the generating-chamber *a* through a pipe *q*, preferably provided with a coil at the base of the generating-chamber to heat a water-supply within said generating-chamber and convert it into steam. An inlet for cold water or other cooling fluid is indicated at *r*, leading into the cooling-chamber *f*. The coil of the steam-pipe *q* is provided with a waste-pipe *s*, which may lead the waste from the coil to a trap. The steam-pipe *q* may be provided with the controlling-valve *t*.

It will be evident that the non-conducting jacket *i* of the generator-chamber *a* prevents loss from radiation of heat, and therefore the device requires less steam to evaporate the water in the generator *a*. It is well known that the loss from this cause is considerable in stills having exposed surfaces.

The condensing-chamber *b* is so constructed that condensation takes place on the inner surface of the cover, the water of condensation running down the inner surface of the cover into the annular gutter *d*, surrounding the upper portion of the generating-chamber, instead of dripping back into the generator, there to be vaporized again at the expense of more steam. The water of condensation is thus carried from the gutter into the coil or worm *e*, passed through the condensing-tank *f* and to an outlet *u*, the water being discharged from said outlet absolutely pure and cold. The shell *h* of the condensing-tank is preferably carried upward and flanged at its upper end, the flange being united with a corresponding flange of the cover *c*, as indicated at W. The outer jacket *h* of the condenser-tank is shown carried upward and united with the wall of the condensing-chamber, as shown at W, said jacket being shown perforated toward its upper end, as indicated at *x*, above the condenser-tank, said jacket being also perforated toward its lower end, as indicated at *y*. By spacing the condensing-tank from the generating-chamber and from the condensing-chamber and forming the jacket *h* with the perforations *x* and *y* it is evident that a circulation of air is provided for be-

tween the generating-chamber and the condensing-tank.

Water from the water-service pipe through the pipe *r* may supply the condensing-tank *f*, and after being used for condensing purposes the same overflows at the top of the condenser-tank into the pipe *j*, leading into the automatic regulator *k*, the waste water from the condensing-tank which has become heated being supplied automatically to the generating-chamber *a*, the surplus being carried off by means of the pipe *m*, as to a sewer. It will be evident that by means of the regulating device *k* the water-level in said regulator will be the same as the water-level in the generating-chamber *a*. Supplying the generating-chamber *a* with hot waste water from the condensing-tank is obviously a very economical feature of the device, as the consumption of steam is thereby rendered considerably less than it would be if cold water from the service-pipe were admitted directly into the generating-chamber.

To prevent the liability of any water that might be generated by the heat splashing over the upper end of the generator-chamber into the annular gutter, a perforated diaphragm *o* or analogous device may be employed. An outlet from the condenser-tank is indicated at *z*.

It will be understood that the main condensation and cooling takes place in the coils within the condenser-tank. While we have shown and described the steam-inlet pipe *q* arranged in the form of a coil within the generating-chamber, we would have it understood that we contemplate any suitable generating or heating device within the generating-chamber or to be a part of the generating-chamber to evaporate the water therein. Furthermore, while we have described the still as especially designed as a water-still, we would have it understood that we do not limit its use solely thereto, as it may be applied for other purposes within the scope of our invention.

What we claim as our invention is—

1. A still embodying a steam-generating chamber, a condenser-chamber above the generating-chamber provided with an annular gutter at its base projecting outwardly from the top of the generating-chamber, a condenser-tank surrounding the generating-chamber located below said gutter, a condenser-pipe within the condenser-chamber leading through the base of the gutter, an overflow-pipe leading from the condenser-tank into the generating-chamber, a regulating device interposed in the overflow-pipe, and a waste-pipe leading from the regulator, the wall of the generating-chamber projecting upward within the condensing-chamber.

2. A still embodying a steam-generating chamber, a condenser-chamber over the generating-chamber provided with an annular gutter at its base projecting outwardly from the top of the generator, a cylindrical condensing-tank surrounding the generator below said gutter spaced from the generating-chamber, a condenser-pipe within the condenser-tank and leading through the base of said gutter, an overflow-pipe communicating with the top of the condenser-tank and with the generating-chamber and a regulator in said overflow-pipe.

3. A still embodying a steam-generating chamber provided with a non-conducting jacket, a condensing-chamber above the generator into which the generator communicates provided with an annular gutter at the base thereof projecting outwardly from the top of the generating-chamber, a condensing-tank below said gutter surrounding the generator and spaced therefrom, a condenser-pipe within said tank and leading through the base of said gutter, an overflow-pipe communicating with the top of the condenser-tank, a regulating device into which the overflow-pipe leads, a pipe leading from the regulating device into the generating-chamber to carry the overflow from the condenser-tank back into the generator, and a waste-pipe leading from said regulating device.

4. A still embodying a generating-chamber, a steam-pipe leading into and arranged therewithin, a condensing-chamber above the generating-chamber into which the upper end of the generating-chamber communicates provided with an annular gutter at the base thereof projecting outwardly from the top of the generator, a condenser-tank located about the generator below said gutter, a condenser-pipe within the condenser-tank to carry condensed water from the gutter through the condenser-tank, an outlet for said pipe, means to supply a cooling fluid to the condenser-tank, an overflow device leading from the condenser-tank back into the generator-chamber, and a regulator in said overflow device.

5. A still embodying a generating-chamber, a condensing-chamber above the generating-chamber into which the generator communicates, a gutter at the base of the condensing-chamber, a condenser-tank, means to lead the water of condensation from the gutter through the condenser-tank, means to supply a cooling liquid to the condenser-tank, a pipe to carry the overflow from the condenser-tank back into the generating-chamber, and a regulator located in said pipe, the wall of the generating-chamber projecting upwardly within the condensing-chamber.

6. A still embodying a generating-chamber, a condenser-chamber arc shape in vertical section into which the generator communicates, an annular gutter at the base of the condenser-chamber projecting outwardly from the top of the generating-chamber, a condenser-tank, means to supply water to said tank, means to conduct the condensed water from the gutter through the condensing-tank, an overflow-

pipe leading from the top of said chamber into the generating-chamber, and an automatic regulator interposed in the overflow-pipe, the wall of the generating-chamber projecting upwardly within the condensing-chamber.

7. A still embodying a generating-chamber, a condensing-chamber into which the generating-chamber communicates provided with an annular gutter at the base thereof projecting outwardly from the top of the generating-chamber, a condensing-tank surrounding the generator and spaced therefrom and from said gutter, an overflow-pipe communicating with the condenser-tank, a regulating device into which the overflow-pipe leads, and a pipe leading from the regulating device into the generating-chamber to carry the overflow from the condenser-tank back into the generator, the still constructed to provide a circulation of air between the generating-chamber and the condenser-tank.

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

GEORGE A. YOUNG.
CHARLES A. YOUNG.

Witnesses:
N. S. WRIGHT,
M. M. STRUBLE.