No. 798,454. PATENTED AUG. 29, 1905.

S. G. SCANLAN.

HEATER.

APPLICATION FILED APR. 15, 1903.

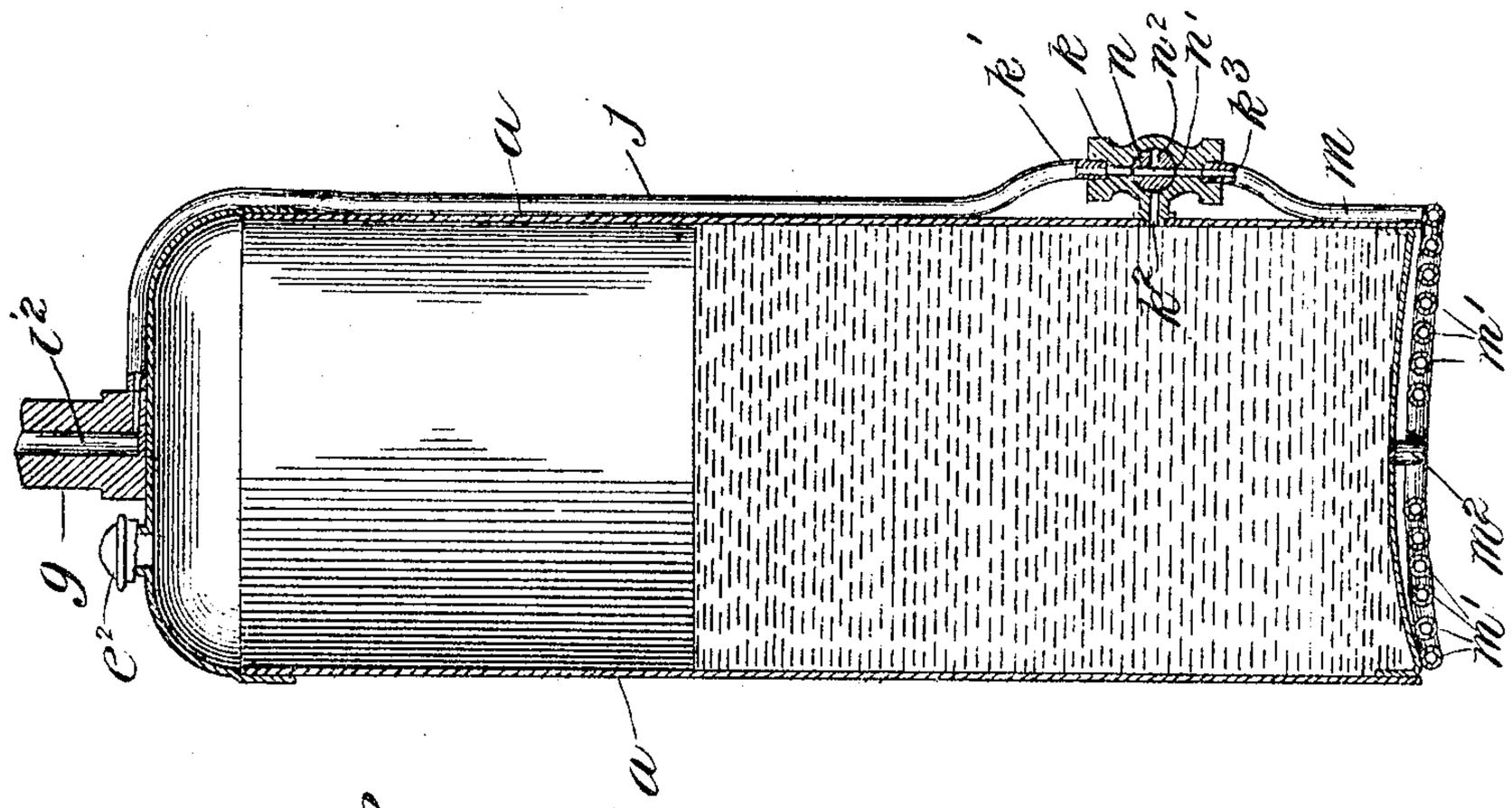

Fig. 2.

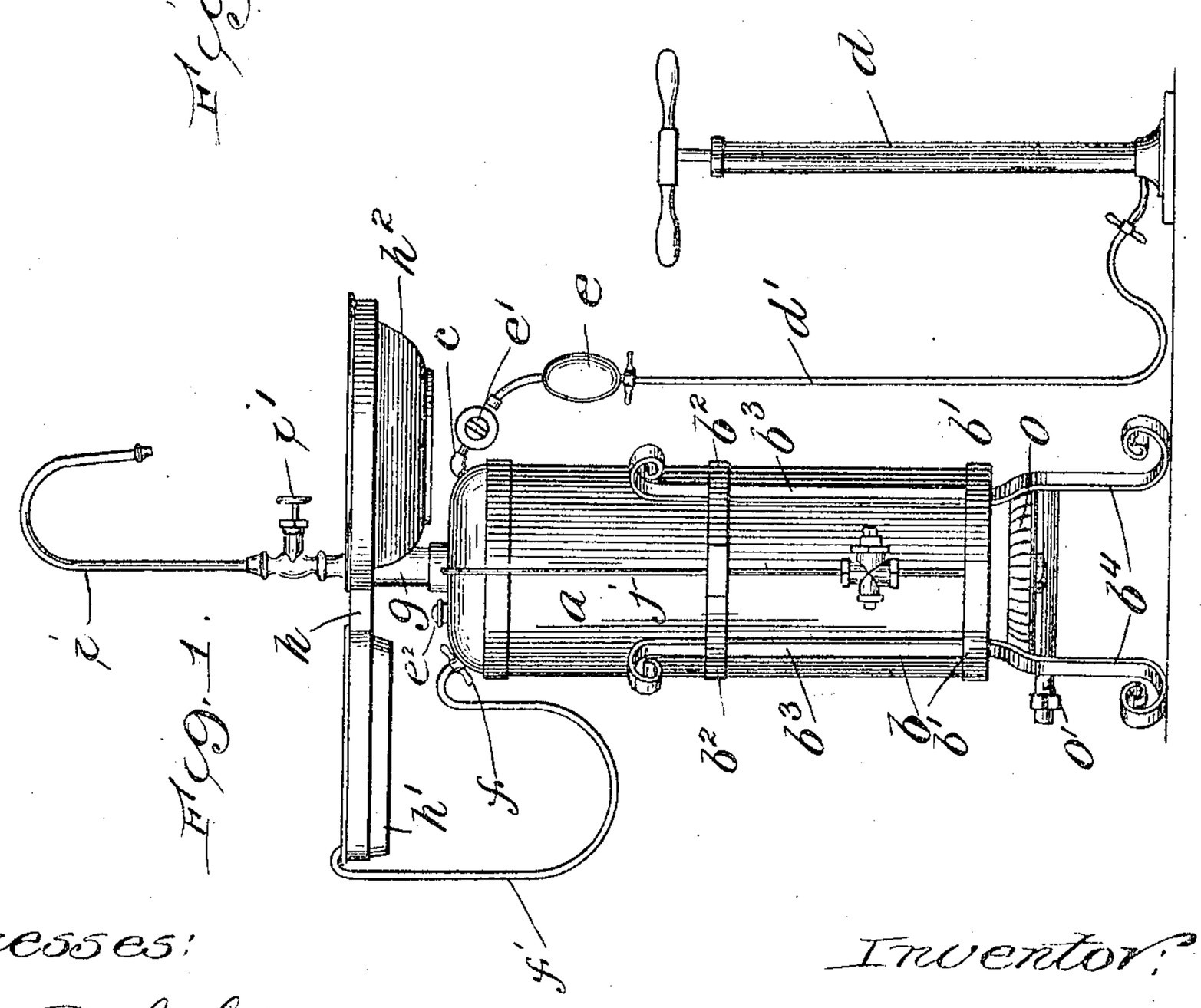

Fig. 1.

Witnesses:

Harry D. Corbett.

Ray White.

Inventor:

Sam Gwyn Scanlan

By Howard M. Cox. Atty.

UNITED STATES PATENT OFFICE.

SAM GWYN SCANLAN, OF CHICAGO, ILLINOIS.

HEATER.

No. 798,454. Specification of Letters Patent. Patented Aug. 29, 1905.

Application filed April 15, 1903. Serial No. 152,749.

To all whom it may concern:

Be it known that I, SAM GWYN SCANLAN, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Heaters for Surgical and other Purposes, of which the following is a specification.

My invention relates to heaters for the use of surgeons and others requiring sterilized water, either cold or heated, and the purpose of my invention is to provide means for storing water or other liquid in such a manner that it may be readily accessible to the operator and withdrawn at a high or low temperature at will.

My invention also contemplates the convenient and thorough sterilization of the water when the same is introduced into the containing vessel in an unsterile condition.

These objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a general side view of the complete device, and Fig. 2 is a central vertical sectional view of the tank and connected parts.

Similar letters refer to similar parts throughout both views.

The vessel *a* consists, preferably, of a cylindrical metallic tank arranged in a vertical position and is supported upon the stand *b*. It is desirable that the tank be removable from said stand, and to this end the latter comprises the bottom ring *b'* and at a point higher up the ring b^2, the rings being held in proper relation by means of the uprights b^3. Said rings are both adapted to prevent lateral displacement of the tank; but the said bottom ring also forms the support for the same, making contact therewith chiefly at the periphery thereof, so as to leave the bottom of the tank exposed. The legs b^4 of said stand are constructed to maintain the bottom of the tank at a suitable elevation from the floor or other supporting structure. With the exception of certain apertures hereinafter described said tank *a* is air and liquid tight, and at a convenient point, preferably in the top thereof, is the nipple or other pipe-coupling *c*, through which air or other gas under pressure may be introduced into said tank. This is accomplished by means of a pump *d*, connected with said coupling *c* through the hose *d'*. In order that the gas entering said tank may be free from impurities, a filter *e* is placed in said hose, and for preventing the escape of gas from said tank after introduction the shut-off valve *e'* is provided. The tank is provided with a filler-cap e^2, through which water may be introduced. By preference said cap is screw-threaded, so as to insure a tight joint and at the same time be readily removable. A coupling *f* is also located in the top of said tank to form a connection for the hose *f'*. Said hose may be furnished with any of the known suitable devices for controlling the escape of the gas from said tank. The column *g* is mounted on said tank *a* and forms a support for the frame *h*, wherein the basin *h'* and tray h^2 rest. Said column also carries the discharge-pipe *i* and valve or faucet *i'*. By preference said column has the central vertical passage i^2, which forms the connecting-duct between said pipe *i* and the leader-pipe *j*.

On the side of tank *a* at a point intermediate of the height thereof is the valve-casing *k*, which is provided with three apertures k' k^2 k^3. Said aperture k' connects with the pipe *j*. Said aperture k^2 connects with the interior of said tank, and said aperture k^3 connects with the pipe *m*, which forms the upper extremity of the pipe-coil *m'*. The valve *n* in said casing is constructed so as to form, in connection with the casing *k*, what may be termed a "three-way" cock, said valve having the straight central duct *n'* extending completely through said valve and the side duct n^2 leading laterally from said duct *n'*. The parts are so arranged that when duct *n'* is in one rotated position, as shown in Fig. 2, the pipe *m* is in communication with the pipe *j* only. When said valve is in a second rotated position, pipe *m* is in communication with the tank *a* only, and when said valve is in a third rotated position said tank is in communication with the pipe *j* only.

The pipe-coil above mentioned is located beneath the tank in close proximity thereto, and the extremity m^2 of said coil connects with and leads from the interior of said tank *a* at the bottom thereof. The burner *o* is mounted in the stand *b* beneath the coil *m'*, so as to heat the same. The said burner is by preference adapted for the combustion of gas, which may be supplied thereto through the coupling *o'*; but other means of heating the coil may be substituted.

In operation the tank is first partially filled with raw water, and subsequently air is forced into the space between the surface of the water and the top of the tank by means of the force-pump *d*. The purpose in thus

introducing air under pressure into the tank is to enable the water to be forced out through the discharge-pipe *i* when the faucet *i'* is opened. As the air from the pump *d* passes through the filter *e* all impurities in the air are prevented from entering the tank. When the air-pressure within the tank is deemed sufficient, the valve *e'* is closed, and, if desired, the pump *d* may be removed. If it is not necessary that the water be sterilized, said water may be immediately drawn off by rotating the valve *n* in the three-way cock to the position in which the passage *n'* in said valve communicates with the passage k^2 of the valve-casing and the passages n^2 with the pipe *j*. As said valve-casing is located at a point above the bottom of the tank, the water thus drawn off may have had an opportunity to settle and the sediment will be below said valve-casing, and therefore will not enter the same. If, however, sediment has previously become deposited in the coil *m'* below the tank, the same may be cleaned out by rotating the valve *n* to the position shown in Fig. 2, in which the passage m^2 connects the pipe *m* with the pipe *j*. When the valve is in this position, the water can escape only through said pipes *m* and *j*, and the rush of water therethrough will carry the sediment up through the pipe *i*. If it is desired that the water within the tank be rendered sterilized, the burner *o* is put in operation and raises the temperature of the water in the coil *m'*; and the valve *n* is rotated to such a position that the discharge n^2 connects with the pipe *m* and the discharge *n'* in said valve connects with the discharge k^2 in the valve-casing. When said valve is in this position, the communication with the pipe *j* is cut off and the pipe *m* communicates with the interior of the tank through the aperture k^2. Under these last-named conditions as the water in the coil *m* is heated it tends to rise and passes through pipe *m* and aperture k^2 into the interior of the tank. This induces a circulation between the coil and the tank, and by continuing the heating process the water within the tank may be boiled until sterilization is complete. If the cold, raw, or unsterilized water first introduced into the tank is wanted for immediate use, but it is required that the same shall be hot, the burner *o* is lighted and the valve *n* rotated to the position shown in Fig. 2. If under these conditions the faucet *i'* is turned on part way, so that the discharge of the water through pipe *i* shall be comparatively slow, the water coming through said pipe will be heated and the temperature to which the discharged water will be raised will be dependent upon the heating capacity of the burner and the rapidity with which the water is drawn off. With a good burner effective over substantially the entire surface of the coil, as is contemplated in my device, the water may be even raised to a boiling-point during its passage through the coil *m'*, and subsequently become sterile, or substantially so, as it is discharged through said pipe *i*. It will be noted that under these last conditions the temperature of the body of water in the tank remains substantially unchanged and the heating is applied only to the water which is drawn off. Herein lies one of the advantageous features of my mechanism, for by this construction it is not necessary to await the heating of the entire mass of water; but only such of the water is heated as may be momentarily required. If in thus drawing off the water through the hot coil *m'* and discharging it into basin h^2, for example, the operator finds the temperature of the discharged water to be too great, he may cool it by rotating the valve *n* to such a position that the communication with the pipe *m* is cut off and the pipe *j* is connected directly with the tank through the discharge k^2. Cool water may thus be drawn off from the tank until the mixture in basin h^2 is at the desired temperature. In other words, by use of my invention it is, practically speaking, possible to draw off hot and cold water from the same tank.

Although I have shown and described certain appliances which would under ordinary circumstances be useful in connection with the heater, these may be varied in form or arrangement or entirely omitted without departing from the spirit of my invention. For example, the method of supporting the tank is non-essential, and so, also, is the means by which air is forced into the tank. It is also within my conception that the frame *h*, basin *h'*, and tray h^2 may be varied or eliminated, if desired.

I hereby direct attention to another application for Letters Patent on heaters, filed by me in the United States Patent Office July 6, 1903, Serial No. 164,438, issued November 10, 1903, as Patent No. 743,571.

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

1. In a device of the class described in combination with a tank having means for admitting liquid to it; a burner located below said tank, a heating-coil adapted to be heated by said burner and connected to the tank at substantially the bottom of the liquid-chamber of the tank, the heating-coil and burner being so proportioned in size to each other that liquid passing once through the coil will be heated hot by the burner, a discharge-pipe connected to the heating-coil, a three-way cock in the discharge-pipe, having an independent connection with the tank at a point above the entrance-point of the heating-coil and below the normal level of the liquid in the tank, the valve of said three-way cock being so located that it may be turned; to discharge water directly from the heating-coil; to discharge water from the heating-coil back into the tank;

or to discharge water directly from the tank through the upper connection of the three-way cock, and means for exerting pressure upon the top of the liquid within the tank.

2. In a device of the class described in combination with a tank having means for admitting liquid to it; a burner located below said tank, a heating-coil adapted to be heated by said burner and connected to the tank at substantially the bottom of the liquid-chamber of the tank, the heating-coil and burner being so proportioned in size to each other that liquid passing once through the coil will be heated hot by the burner, a discharge-pipe connected to the heating-coil, a three-way cock in the discharge-pipe, having an independent connection with the tank at a point above the entrance-point of the heating-coil and below the normal level of the liquid in the tank, the valve of said three-way cock being so located that it may be turned; to discharge water directly from the heating-coil; to discharge water from the heating-coil back into the tank; or to discharge water directly from the tank through the upper connection of the three-way cock, and means for exerting pressure upon the top of the liquid within the tank, all the parts being arranged and disposed substantially as shown and described for the purposes set forth.

SAM GWYN SCANLAN.

Witnesses:
JULIA M. BRISTOL,
HOWARD M. COX.